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IDENTIFICATION

PRODUCT CODE: AC-S081B-MC

PRODUCT NAME: CXRMDB0 RP04/5/6 RM02/3/5 MOD

PRODUCT DATE: JANUARY 1982

MAINTAINER: DEC/X11 SUPPORT GROUP

1. ABSTRACT

RMD IS AN IOMODX WHICH WILL EXERSIZE UP TO 8 RP04/5/6 OR RM02/3/5 DISK DRIVES ON AN RH11/PH70 CONTROLLER, OR DUAL-PORTED BETWEEN TWO SUCH CONTROLLERS. IN SINGLE-PORT MODE, THE ENTIRE SURFACE OF EACH DISK WILL BE TESTABLE (RANDOMLY OR SYSTEMATICALLY).

IN DUAL-PORT MODE, THE "A" CONTROLLER MODULE WILL ACCESS ONLY THE LOW HALF OF THE DISK, AND THE "B" CONTROLLER MODULE WILL ACCESS ONLY THE HIGH HALF OF THE DISK; NO COMMUNICATION WILL BE ATTEMPTED BETWEEN THE TWO PORTS. ONE COPY OF THIS MODULE MUST BE CONFIGURED FOR EACH PORT.
SINGLE/DUAL PORT MODE WILL BE AUTOMATICALLY SELECTED ON THE BASIS OF THE RPDT REGISTER OF EACH SELECTED DRIVE.
DURING TESTING, ANY BAD SECTOR FOUND WILL BE STORED AUTOMATICALLY AND WITHOUT OPERATOR INTERVENTION INTO THE MODULE'S BADSPOT TABLE. A MESSAGE CAN BE PRINTED TO NOTIFY THE OPERATOR OF THE BADSPOT ADDRESS (SEE OPERATOR OPTIONS). SECTORS LISTED IN THE TABLE WILL NOT BE TESTED ON ANY DRIVE.
THE WBUFRQ WORD IN THE HEADER MAY BE CHANGED AT WILL TO ALTER THE MODULE'S TRANSFER SIZE (AND OF COURSE A AND B-PORT SIZES NEED NOT MATCH); THIS WILL NOT ALTER THE EFFECTIVENESS OF THE BADSPOT TABLE OR CAUSE THE MODULE TO ATTEMPT ACCESS OF OUT-OF-RANGE DISK ADDRESSES. WITHIN THIS FRAMEWORK, THE MODULES WILL ACCESS AS MUCH OF THE DISK AS POSSIBLE. RANDOM SEEKS WILL BE USED UNLESS THIS OPTION IS DESELECTED IN SR1.

2. REQUIREMENTS

HARDWARE: 1 TO 8 RP04/5/6 OR RM02/3/5 DRIVES ON 1 OR 2 RH11/RH70 CONTROLLERS

STORAGE:: RMD REQUIRES:
DECIMAL WORDS: 2196
OCTAL WORDS: 4224
OCTAL BYTES: 10450

3. PASS DEFINITION

ONE PASS CONSISTS OF 300 ITERATIONS.
AN ITERATION CONSISTS OF THE FOLLOWING STEPS EXECUTED ON EACH SELECTED DRIVE:

A. WRITE DATA TO DISK. IN DUAL-PORT MODE, PORT "A" MODULE WILL TEST THE LOW HALF OF THE DISK (CYLINDERS 0 TO 407 FOR RP06, CYLINDERS 0 TO 205 FOR RP04/5), PORT "B" WILL EXERSIZE THE HIGH HALF (CYLINDERS 206 TO 410 FOR RP04/5, CYLINDERS 408 TO 814 FOR RP06).
IN SINGLE-PORT MODE, THE MODULE WILL ACCESS THE ENTIRE DISK SURFACE (CYLINDERS 0 TO 410 FOR RP04/5, CYLINDERS 0 TO 814 FOR RP06).
B. WRITE-CHECK DATA JUST WRITTEN.
C. READ 256 WORDS (1 SECTOR) INTO MODULE READ BUFFER.
D. DO IN-CORE COMPARE OF READ BUFFER WITH FIRST 256 WORDS OF WRITE BUFFER.
E. RELEASE THE DRIVE FOR OTHER PORT TO TEST.

4. EXECUTION TIME

ONE PASS OF RMD RUNNING ALONE ON A PDP-11/70 TAKES ABOUT A MINUTE.

5. CONFIGURATION REQUIREMENTS

DEFAULT PARAMETERS:
DVA=176700 VCT=254 SR1=5 DVC=1

REQUIRED PARAMETERS:
SR1 MUST BE SET UP TO INDICATE WHICH PORT (A/B) THIS COPY OF THE MODULE IS TO TEST, IF ANY DRIVES ARE DUAL-PORTED. ALSO, BIT 7 MUST BE SET IF THE CONTROLLER IS AN RH70, AND CLEARED IF IT IS NOT AN RH70.

6. DEVICE/OPTION SETUP

MAKE SURE ALL DRIVES ARE POWERED UP, WRITE ENABLED, AND READY.
FOR DUAL-PORTED DRIVES: MAKE SURE CONTROLLER SELECT SWITCH IS IN A/B POSITION. IF DRIVE IS NOT CYCLED UP WITH SWITCH IN CORRECT POSITION, PLACE SWITCH CORRECTLY, AND DISABLE THEN RE-ENABLE DRIVE USING DRIVE DISABLE SWITCH.

7. OPERATOR OPTIONS

SR1

BIT 2
CLEAR(0):
TYPE OUT DATA LATE ERRORS (HARD ERROR) AND COUNT THEM INTERNALLY.
SET(1):
COUNT DATA LATE ERRORS INTERNALLY, BUT DO NOT TYPE OUT.

BIT 4
CLEAR(0):
THIS COPY OF RMD TESTS A-PORT ON ANY DUAL-PORTED DRIVES.
SET(1):
THIS COPY OF RMD TESTS B-PORT ON ANY DUAL-PORTED DRIVES.

BIT 5
CLEAR(0):
TEST DISKS WITH RANDOM SEEKS.
SET(1):
DISABLE RANDOM SEEKS. INCREMENT SECTOR BY ONE EACH CYCLE.

BIT 6
CLEAR(0):
DO NOT TYPE OUT BADSPOTS.
SET(1):
ALWAYS TYPE OUT ANY BADSPOT NOT ALREADY RECORDED ON BADSPOT TABLE.

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            BIT 7
               CLEAR(0):
                 CONTROLLER IS RH11.
               SET(1):
                 CONTROLLER IS RH70 (HAS RHBAE AND RHCS3)

      8.    NON-STANDARD PRINTOUTS
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            A.  MOST PRINTOUTS HAVE THE STANDARD FORMATS.

            B.  ERROR MESSAGE DUMP RH11 REGISTERS IN THE FOLLOWING ORDER:
                RHCS1  RHWC   RHBA   RPDA   RHCS2  RPDS   RPER1  RPAS
                RPLA   RHDB   RPMR   RPDT   RPSN   RPOF   RPDC   RPCC
                RPER2  RPER3  RPEC1  RPEC2
                   ;       REVISION DATE: 2-APR-80                          ;WMRMRP
                   ;                                                        ;WMRMRP
                   ; THIS MODULE HAS BEEN MODIFIED TO SUPPORT NOT           ;WMRMRP
                   ; JUST THE RP04/5/6 BUT ALSO THE RM02/3/5 SINGLE AND     ;WMRMRP ;RMDB5
                   ; DUAL PORT.  THE MODIFICATIONS ARE MARKED BY THE        ;WMRMRP
                   ; REFERENCE 'WMRMRP',RMDB, AND RMDB5.                    ;WMRMRP
                   ;                                                        ;WMRMRP
                   ; THE ORDER OF THE REGISTERS WILL VARY SLIGHTLY          ;WMRMRP
                   ; BETWEEN AN RM AND AN RP.  THE DIFFERENCES ARE AS       ;WMRMRP
                   ; FOLLOWS:                                              ;WMRMRP
                   ;       FOR RP          ADDRESS         FOR RM          ;WMRMRP
                   ;       ------          -------         ------          ;WMRMRP
                   ;       RPCC            776736          RMHR            ;WMRMRP
                   ;       RPER2           776740          RMMR2           ;WMRMRP
                   ;       RPER3           776742          RMER2           ;WMRMRP

            C.  THE BAD SECTOR MESSAGE (WHEN ENABLED) LOOKS LIKE:
                'DRIVE X:  BADSPOT AT (OCTAL) CYL:  XX, TRK:  XX, SEC:  XX'
                WHERE 'X' IS AN OCTAL DIGIT.  NO ERROR IS ASSOCIATED WITH THIS
                MESSAGE.

*****************************************************************************
*                                                                           *
*       EDIT:   BY:             DATE:           REASON:                     *
*                                                                           *
*                                                                           *
*  H.E.F.       -       1-JAN-82        - FIX PROBLEMS LISTED IN AIDS REPORT  *
*                                       - # CC0001217 ( 1. RM AS LOAD MEDIA;  *
*                                       - 2. DUAL PORT / WRITE CHECK RETRIES  *
*                                       - EXCEEDED; 3. SYSTEM ERRORS ON RH11  *
*                                       - CONTROLLER ON AN 11/70; 4. INCORRECT*
*                                       - HANDLING OF BAD SPOTS ON LAST SECTOR,
*                                       - 5. DUAL-PORT MXF ERRORS ).          *
*  H.E.F.       -       1-JAN-82        - ADD SUPPORT FOR RM05. THIS WAS ADDED*
*                                       - EVEN THOUGH AN RM05 MODULE (RMCA)   *
*                                       - EXISTS BECAUSE SOMETIMES WE HAVE    *
*                                       - RP04/5/6 AND RM05'S ON THE SAME     *
*                                       - CONTROLLER.                         *
*  H.E.F.       -       1-JAN-82        - AUTO-HANDLING OF BAD SECTOR ERRORS  *
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*                                       - ON RM02/3/5.                        *
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                .SBTTL  MODULE HEADER BLOCK                                     ;DRB001
000000'                 IUMODX <RMDB  >,176700,254,5,0,0,1500,104,RBUF,256.,256.        ;WMRMRP ;RMDB5
000000'                 MODULE  150000,RMDB  ,176700,254,5,0,0,1500,104,RBUF,256.,256.
                        .TITLE  RMDB DEC/X11 SYSTEM EXERCISER MODULE
                ;       DDXCOM  VERSION  6.3    14-AUG-81
                                .LIST   MIN
                        ;*****************************************************************************
000000'                 BEGIN:
000000' 046522  041104      040 MODNAM: .ASCII  /RMDB / ;MODULE NAME.
000005'     000         XFLAG:  .BYTE   0PEN            ;USED TO KEEP TRACK OF WBUFF USAGE
000006' 176700          ADDR:   176700+0                ;1ST DEVICE ADDR.
000010' 000254          VECTOR: 254+0                   ;1ST DEVICE VECTOR.
000012'     240         BR1:    .BYTE   PRTY5+0         ;1ST BR LEVEL.
000013'     000         BR2:    .BYTE   PRTY0+0         ;2ND BR LEVEL.
000014' 000001          DVID1:  0+1                     ;DEVICE INDICATOR 1.
000016' 000000          SR1:    OPEN                    ;SWITCH REGISTER 1
000020' 000000          SR2:    OPEN                    ;SWITCH REGISTER 2
000022' 000000          SR3:    OPEN                    ;SWITCH REGISTER 3
000024' 000000          SR4:    OPEN                    ;SWITCH REGISTER 4
                        ;*****************************************************************************
000026' 150000          STAT:   150000                  ;STATUS WORD.
000030' 002374'         INIT:   START                   ;MODULE START ADDR.
000032' 000252'         SPUINT: MODSP                   ;MODULE STACK POINTER.
000034' 000000          PASCNT: 0                       ;PASS COUNTER.
000036' 001500          ICONT:  1500                    ;# OF ITERATIONS PER PASS=1500
000040' 000000          ICOUNT: 0                       ;LOC TO COUNT ITERATIONS
000042' 000000          SOFCNT: 0                       ;LOC TO SAVE TOTAL SOFT ERRORS
000044' 000000          HRDCNT: 0                       ;LOC TO SAVE TOTAL HARD ERRORS
000046' 000000          SOFPAS: 0                       ;LOC TO SAVE SOFT ERRORS PER PASS
000050' 000000          HRDPAS: 0                       ;LOC TO SAVE HARD ERRORS PER PASS
000052' 000000          SYSCNT: 0                       ;# OF SYS ERRORS ACCUMULATED
000054' 000000          RANNUM: 0                       ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
000056'                 CONFIG:                         ;RESERVED FOR MONITOR USE
000056' 000000          RES1:   0                       ;RESERVED FOR MONITOR USE
000060' 000000          RES2:   0                       ;RESERVED FOR MONITOR USE
000062' 000000          SVR0:   OPEN                    ;LOC TO SAVE R0,
000064' 000000          SVR1:   OPEN                    ;LOC TO SAVE R1.
000066' 000000          SVR2:   OPEN                    ;LOC TO SAVE R2.
000070' 000000          SVR3:   OPEN                    ;LOC TO SAVE R3.
000072' 000000          SVR4:   OPEN                    ;LOC TO SAVE R4.
000074' 000000          SVR5:   OPEN                    ;LOC TO SAVE R5.
000076' 000000          SVR6:   OPEN                    ;LOC TO SAVE R6.
000100' 000000          CSRA:   OPEN                    ;ADDR OF CURRENT CSR.
000102'                 SBADR:                          ;ADDR OF GOOD DATA, DP
000102' 000000          ACSR:   OPEN                    ;CONTENTS OF CSR.
000104'                 WASADR:                         ;ADDR OF BAD DATA, DP
000104' 000000          ASTAT:  OPEN                    ;STATUS REG CONTENTS.
000106'                 ERRTYP:                         ;TYPE OF ERROR
000106' 000000          ASB:    OPEN                    ;EXPECTED DATA.
000110' 000000          AWAS:   OPEN                    ;ACTUAL DATA.
000112' 002604'         RSTRT:  RESTRT                  ;RESTART ADDRESS AFTER END OF PASS
000114' 000000          WDTO:   OPEN                    ;WORDS TO MEMORY PER ITERATION
000116' 000000          WDFR:   OPEN                    ;WORDS FROM MEMORY PER ITERATION
000120' 000000          INTR:   OPEN                    ;# OF INTERRUPTS PER ITERATION
000122' 000104          IDNUM:  104                     ;MODULE IDENTIFICATION NUMBER=104
000124' 001242'         RBUFVA: RBUF                    ;READ BUFFER VIRTUAL ADDRESS
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000126' 000000          RBUFPA: OPEN                    ;READ BUFFER PHYSICAL ADDRESS
000130' 000000          RBUFEA: OPEN                    ;READ BUFFER EA BITS
000132' 000400          RBUFSZ: 256.                    ;SIZE OF THE READ BUFFER
000134' 000000          WBUFPA: OPEN                    ;WRITE BUFFER PHYSICAL ADDRESS
000136' 000000          WBUFEA: OPEN                    ;WRITE BUFFER EA BITS
000140' 000400          WBUFRQ: 256.                    ;WRITE BUFFER SIZE REQUESTED
000142' 000000          WBUFSZ: OPEN                    ;WRITE BUFFER SIZE AVAILABLE
000144' 000000          CDERCT: OPEN                    ;CDATA/DATCK ERROR COUNT
000146' 000000          CDWDCT: OPEN                    ;CDATA/DATCK WORD COUNT
000150' 000000          FREE:   OPEN                    ;RESERVED FOR FUTURE USE
        000040                  .REPT   SPSIZ           ;MODULE STACK STARTS HERE.
                                .NLIST
                                .WORD   0
                                .LIST
                                .ENDR
000252'                 MODSP:
                        ;*****************************************************************************
2                               ;                                                       ;WMRMRP
3                               ;                                                       ;WMRMRP
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                                .SBTTL  MODULE PRIVATE DATA                                     ;DRB001
000252'                         BADSPT:                 ;BAD SPOT TABLE.  THERE IS ROOM FOR 96  ;DRB001
                                                        ;BAD SPOTS, IN TWO-WORD FORMAT, CYLINDER ;DRB001
                                                        ;FIRST, THEN SECTOR IN LOW BYTE OF SECOND ;DRB001
                                                        ;WORD, AND TRACK IN HIGH BYTE.          ;DRB001
000252' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000254' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000256' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000260' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000262' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000264' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000266' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000270' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000272' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000274' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000276' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000300' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000302' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000304' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000306' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000310' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000312' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000314' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000316' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000320' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000322' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000324' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000326' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000330' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000332' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000334' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000336' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000340' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000342' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000344' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000346' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000350' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000352' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000354' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000356' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000360' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000362' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000364' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000366' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000370' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000372' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000374' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000376' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000400' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000402' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000404' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000406' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000410' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000412' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000414' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000416' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
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000420' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000422' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000424' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000426' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000430' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000432' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000434' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000436' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000440' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000442' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000444' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000446' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000450' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000452' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000454' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000456' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000460' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000462' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000464' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000466' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000470' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000472' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000474' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000476' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000500' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000502' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000504' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000506' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000510' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000512' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000514' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000516' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000520' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000522' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000524' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000526' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000530' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000532' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000534' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000536' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000540' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000542' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000544' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000546' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
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000562' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
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000566' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000570' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000572' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
000574' 177777                          177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
000576' 177777                          177777          ;CYLINDER ADDRESS                       ;DRB001
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  416  000600' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  417  000602' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  418  000604' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  419  000606' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  420  000610' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  421  000612' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  422  000614' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  423  000616' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  424  000620' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  425  000622' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  426  000624' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  427  000626' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  428  000630' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  429  000632' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  430  000634' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  431  000636' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  432  000640' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  433  000642' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  434  000644' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  435  000646' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  436  000650' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  437  000652' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  438  000654' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  439  000656' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  440  000660' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  441  000662' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  442  000664' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  443  000666' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  444  000670' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  445  000672' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  446  000674' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  447  000676' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  448  000700' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  449  000702' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  450  000704' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  451  000706' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  452  000710' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  453  000712' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  454  000714' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  455  000716' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  456  000720' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  457  000722' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  458  000724' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  459  000726' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  460  000730' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  461  000732' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  462  000734' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  463  000736' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  464  000740' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  465  000742' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  466  000744' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  467  000746' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  468  000750' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  469  000752' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  470  000754' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  471  000756' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
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  472  000760' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  473  000762' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  474  000764' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  475  000766' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  476  000770' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  477  000772' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  478  000774' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  479  000776' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  480  001000' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  481  001002' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  482  001004' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  483  001006' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  484  001010' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  485  001012' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  486  001014' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  487  001016' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  488  001020' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  489  001022' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  490  001024' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  491  001026' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  492  001030' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  493  001032' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  494  001034' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  495  001036' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  496  001040' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  497  001042' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  498  001044' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  499  001046' 177777                    177777          ;CYLINDER ADDRESS                       ;DRB001
  500  001050' 177777                    177777          ;TRACK/SECTOR ADDRESS                   ;DRB001
  501  001052'                    ENDBBK:                                                        ;DRB001
  502                                                                                           ;DRB001
  503          000004               DLATE   = BIT2                                              ;DRB001
  504          000020               BPORT   = BIT4                                              ;DRB001
  505          000040               NOPAND  = BIT5                                              ;DRB001
  506          000100               BDSPT   =BIT6                                               ;DRB001
  507          000200               RH70    = BIT7                                              ;DRB001
  508          137400               HRDCS2  =137400
  509          177777               HRDER1  =177777
  510          167777               HRDER2  =167777
  511          140153               HRDER3  =140153
  512                                                                  ;**-16                   ;DRB001
  513  001052' 000000  000000  000000  S:      0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
  514  001060' 000000  000000  000000
  515  001066' 000000  000000  000000
  516  001074' 000000  000000  000000
  517  001102' 000000  000000  000000
  518  001110' 000000  000000  000000
  519  001116' 000000  000000  000000
  520  001124' 000000
  521                               ;DO NOT CHANGE THE ORDER OF THE NEXT 4 LOCATIONS
  522                               ;NEEDED FOR MAP22 ROUTINE
  523  001126' 000000               PA18:   0
  524  001130' 000000               XMEM:   0
  525  001132' 000000               PA22:   0
  526  001134' 000000               EA22:   0
  527                                                                  ;**-5                    ;DRB001
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   528  001136' 000252'                NXTBBK: BADSP1          ; NEXT OPEN BADSPOT IN TABLE                    ;DRB001
   529                                                                                                         ;DRB001
   530  001140' 000000                CYLLIM: 0               ; UPPER DISK LIMIT (DEPENDS ON DISK TYPE)       ;DRB001
   531                                                         ;                                               ;WMRMRP
   532                                                         ; THE FOLLOWING ARE SOME ADDITIONAL LOCATIONS   ;WMRMRP
   533                                                         ; THAT WERE ADDED TO ALLOW THIS MODULE TO       ;WMRMRP
   534                                                         ; SUPPORT THE RP04/5/6 AND THE RM02/3           ;WMRMRP
   535                                                         ;                                               ;WMRMRP
   536  001142' 000000                TYPFLG: 0               ; DRIVE TYPE FLAG. RP04/5/6 = BIT 0=1            ;RMDB5
   537                                                         ;                   RM02/3  = BIT 1=1            ;RMDB5
   538                                                         ;                   RM05    = BIT 2=1            ;RMDB5
   539  001144' 000000                IRKLIM: 0               ; UPPER TRACK LIMIT (DEPENDS ON DISK TYPE)      ;WMRMRP
   540  001146' 000000                IRKLM1: 0               ; UPPER TRACK LIMIT +1 (DEPENDS ON DISK TYPE)   ;WMRMRP
   541  001150' 000000                SECLIM: 0               ; UPPER SECTOR LIMIT (DEPENDS ON DISK TYPE)     ;WMRMRP
   542  001152' 000000                SECLM1: 0               ; UPPER SECTOR LIMIT +1 (DEPENDS ON DISK TYPE)  ;WMRMRP
   543  001154' 000000                CYLMSK: 0               ; MASK USED TO DETERMINE DISK MAX CYL ADDRESS   ;WMRMRP
   544  001156' 000000                TRKMSK: 0               ; MASK USED TO DETERMINE DISK MAX TRK ADDRESS   ;WMRMRP
   545  001160' 000000                SECMSK: 0               ; MASK USED TO DETERMINE DISK MAX SEC ADDRESS   ;WMRMRP
   546                                                         ;                                               ;WMRMRP
   547                                                         ; END OF EXTRA LOCATIONS TO HANDLE RP'S AND RM'S ;WMRMRP
   548                                                         ;                                               ;WMRMRP
   549  001162' 000000                CYLNDR: 0               ;ABSOLUTE CYLINDER ADDRESS OF CURRENT OP.       ;DRB001
   550  001164' 000000                CYL:    0               ;RELATIVE DISK ADDRESS                          ;DRB001
   551  001166'                       DSKADR:                 ;FOR REFERENCING TRACK/SECTOR AS WORD           ;DRB001
   552  001166'     000               SECTOR: .BYTE   0       ;SECTOR ADDRESS OF CURRENT OPERATION            ;DRB001
   553  001167'     000               TRACK:  .BYTE   0       ;TRACK ADDRESS OF CURRENT OPERATION             ;DRB001
   554                                                                                                         ;DRB001
   555  001170' 000000                BADCYL: 0               ;FROM DRIVE LOCATION REGISTERS, ON FINDING BADSPOT;DRB001
   556  001172' 000000                BADSEC: 0               ;FROM RPDA ON BADSPOT OCCURANCE                 ;DRB001
   557  001174' 000000                BADTRK: 0               ;FROM RPDA+1 ON BADSPOT                 ;DRB001
   558                                                                                                         ;DRB001
   559  001176' 000000                LASCYL: 0               ;LAST CYLINDER WHICH CAN BE WRITTEN             ;DRB001
   560  001200' 000000                LASTRK: 0       ;LAST TRACK WHICH CAN BE WRITTEN                        ;DRB001
   561  001202' 000000                LASSEC: 0       ;LAST SECTOR WHICH CAN BE WRITTEN                       ;DRB001
   562                                                                                                         ;DRB001
   563  001204' 000000                SIZTRK: 0       ;NUMBER OF TRACKS IN WBUFSZ                             ;DRB001
   564  001206' 000000                SIZSEC: 0       ;REMAINDER OF WBUFSZ, IN SECTORS                        ;DRB001
   565  001210' 000000                FLAG:   0
   566  001212' 000000                DVICE:  0
   567  001214' 000000                DRIVE:  0
   568  001216' 000000                UNITNO: 0
   569                                                                                 ;**-1           ;LRB001
   570  001220' 000000                DLTCNT: 0
   571  001222' 000000                FUNC:   0
   572  001224' 000000                TIMER:  0
   573  001226' 000000                ZERO:   0
   574  001230' 000000                FERADR: 0
   575  001232' 000000                CLK:    0
   576  001234' 000000                TRY:    0
   577  001236' 000000                STORE:  0
   578  001240' 000000                HRDERR: 0
   579  001242' 000400                RBUF:   .BLKW   256.
   580
   581  002242'                       TABLE:
   582  002242' 001052'                       S
   583  002244' 001054'                       S+2
```



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   584  002246' 001056'                       S+4
   585  002250' 001060'                       S+6
   586  002252' 001062'                       S+10
   587  002254' 001064'                       S+12
   588  002256' 001066'                       S+14
   589  002260' 001070'                       S+16
   590  002262' 001072'                       S+20
   591  002264' 001074'                       S+22
   592  002266' 001076'                       S+24
   593  002270' 001100'                       S+26
   594  002272' 001102'                       S+30
   595  002274' 001104'                       S+32
   596  002276' 001106'                       S+34
   597  002300' 001110'                       S+36
   598  002302' 001112'                       S+40
   599  002304' 001114'                       S+42
   600  002306' 001116'                       S+44
   601  002310' 001120'                       S+46
   602  002312' 001122'                       S+50
   603  002314' 001124'                       S+52
   604                                                                   ;**-1                     ;DRB001
   605  002316' 177777                        177777
   606  002320' 000000                RHCS1:  0
   607  002322' 000000                RHWC:   0
   608  002324' 000000                RHBA:   0
   609  002326' 000000                RPDA:   0
   610  002330' 000000                RHCS2:  0
   611  002332' 000000                RPDS:   0
   612  002334' 000000                RPER1:  0
   613  002336' 000000                RPAS:   0
   614  002340' 000000                RPLA:   0
   615  002342' 000000                RHDB:   0
   616  002344' 000000                RPMR:   0
   617  002346' 000000                RPDT:   0
   618  002350' 000000                RPSN:   0
   619  002352' 000000                RPOF:   0
   620  002354' 000000                RPDC:   0
   621  002356' 000000                RPCC:   0
   622  002360' 000000                RPER2:  0
   623  002362' 000000                RPER3:  0
   624  002364' 000000                RPEC1:  0
   625  002366' 000000                RPEC2:  0
   626  002370' 000000                RHBAE:  0
   627  002372' 000000                RHCS3:  0
   628                                                                   ;**-4                     ;DRB001
   629                                .SBTTL  MODULE CODE
   630  002374' 012767  000400  175512 START:  MOV     #256.,WDTO      ;256 WORDS TO MEM/ITERATION
   631  002402' 012767  000400  175506        MOV     #256.,WDFP      ;256 WORDS FROM MEM/ITERATION
   632  002410' 012767  000004  175502        MOV     #4,INTR         ;4 INTERRUPTS/ITERATION
   633  002416' 012701  000252'               MOV     #BADSPT,R1      ;BAD SPOT TABLE                 REV D
   634  002422' 022721  177777        4$:     CMP     #-1,(R1)+       ;END YET ?                      REV D
   635  002426' 001375                        BNE     4$                                      ;REV D
   636  002430' 005741                        TST     -(R1)                                   ;REV D
   637  002432' 010167  176500                MOV     R1,NXTBBK       ;RESET POINTER          ;REV D
   638  002436' 016767  175352  176546        MOV     DVID1,DVICE     ;GET DRIVES TO TEST
   639  002444' 123727  000041  000011        CMPB    @#41,#11        ;IF RP IS LOAD MEDIUM THEN
```

```
 640  002452' 001404                          BEQ     13$             ;BEGIN                                  ;RMDB
 641  002454' 123727  000041  000016  14$:    CMPB    @#41,#16        ; SEE IF RM IS LOAD MEDIUM              ;RMDB
 642  002462' 001024                          BNE     3$                                                      ;RMDB
 643  002464' 113700  000040          13$:    MOVB    @#40,R0         ;   GET LOAD-DEVICE NUMBER
 644  002470' 012701  000001                  MOV     #1,R1           ;   INITIALIZE DEVICE MASK
 645  002474' 105700                  1$:     TSTB    R0              ;   WHILE NOT POINTING AT LOAD-DEVICE DO
 646  002476' 001403                          BEQ     2$              ;   BEGIN
 647  002500' 006301                          ASL     R1              ;       SHIFT MASK TO NEXT DEVICE
 648  002502' 105300                          DECB    R0              ;       KEEP TRACK OF SHIFTING
 649  002504' 000773                          BR      1$              ;   END
 650  002506' 130167  176500          2$:     BITB    R1,DVICE        ;   IF LOAD DEVICE IS SELECTED THEN
 651  002512' 001410                          BEQ     3$              ;   BEGIN
 652  002514' 113767  000040  176474          MOVB    @#40,UNITNO     ;       MOVE LOAD-DEVICE NUMBER TO DRIVE
 653  002522' 004767  002726                  JSR     PC,DROP         ;       DROP THE LOAD-DEVICE
 654                                                                  ;   END
 655  002526' 104403  000000' 012504'        MSG$S,BEGIN,LODMED      ;ASCII MESSAGE CALL WITH COMMON HEADER
 656  002534'                         3$:                             ;END
 657  002534' 005067  176424                  CLR     CYL             ;START AT CYLINDER 0                    ;RMDB
 658  002540' 012767  000377  176420          MOV     #377,DSKADR     ;START AT TRACK 0, SECTOR 0
 659                                                                  ;(* INCREMENT BEFORE TEST *)
 660  002546' 004767  005210                  JSR     PC,SETUP
 661  002552' 004767  005112                  JSR     PC,REZET        ;CLEAR THE RH
 662  002556' 032767  000200  175232          BIT     #RH70,SR1       ;RH70 ?                                 ;OJM01
 663  002564' 001004                          BNE     5$              ; NO DONT PRINT BAE & CS3               ;OJM01;WMRMRP
 664  002566' 012767  177777  177516          MOV     #-1,TABLE+50    ; SHORTEN TEMP STORAGE                  ;OJM01;WMRMRP
 665  002574' 000403                          BR      RESTRT          ; GOTO RESTART                          ;WMRMRP
 666  002576' 012767  001122' 177506  5$:     MOV     #S+50,TABLE+50  ; SET UP TO POINT TO DATA IF REG EXISTS ;WMRMRP ;RMDB
 667  002604'                         RESTRT:
 668
 669  002604' 104415  000000' 000124'         GETPAS,BEGIN, RBUFVA            ;GET PHYSICAL ADDRESS FROM 16-BIT RBUFVA
 670
 671  002612' 012767  177777  176370  LOOP1:  MOV     #-1,UNITNO      ;PRE-SET UNIT NUMBER
 672  002620' 104414  000000'                 GWBUF$, BEGIN           ;GET WRITE BUFFER INFORMATION
 673                                                                          ;**-1                           ;DRB001
 674  002624'                         LOOP2:
 675  002624' 004767  000756          3$:     JSR     PC,PICKDR       ;GO PICK A DRIVE
 676  002630' 103407                          BCS     1$              ;RETURNS HERE IF ALL DRIVES DONE        ;DRB001
 677  002632' 004767  001574                  JSR     PC,WRTLIM       ;GET DISK LIMITS FOR THIS TYPE OF DISK  ;DRB001
 678  002636' 005067  176372                  CLR     TRY             ;ELSE CLR RE TRY COUNT
 679  002642' 004767  000022                  JSR     PC,CYCLE        ;GO DO A CYCLE ON THIS DRIVE
 680  002646' 000766                          BR      LOOP2           ;DO IT TO NEXT DRIVE
 681
 682  002650' 005767  176336          1$:     TST     DVICE           ;ANYBODY LEFT TO CHECK?
 683  002654' 001002                          BNE     2$              ;BR IF YES
 684  002656' 104410  000000'                 END$,BEGIN              ;
 685  002662'                         2$:
 686  002662' 104413  000000'                 ENDITS,BEGIN            ;SIGNAL END OF ITERATION.
 687                                                                  ;MONITOR SHALL TEST END OF PASS
 688  002666' 000751                          BR      LOOP1           ;BR BACK IF NO
 689
 690  002670'                         CYCLE:
 691                                                                          ;**-4                           ;DRB001
 692  002670' 004767  001004                  JSR     PC,PICKBR       ;SELECT A SECTOR TO TEST                ;DRB001
 693  002674' 004567  000026                  JSR     R5,WRITE        ;GO WRITE A BLOCK
 694  002700' 004567  000116                  JSR     R5,WRITCK       ;GO DO WRITE CHECK
 695  002704' 004567  000206                  JSR     R5,READ         ;GO READ A BLOCK
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 696  002710' 104412  000000' 000126'         CDATA$,BEGIN,RBUFPA     ; REQUEST FOR MONITOR TO CHECK DATA
 697  002716' 002720'                         .+2                     ; IF ERROR, CONTINUE
 698  002720' 004767  000266                  JSR     PC,RELEASE      ;RELEASE THE DRIVE                      ;DRB001
 699  002724' 000207                          RTS     PC              ;END CYCLE                              ;DRB001
 700
 701                                                                          ;**-6                           ;DRB001
 702                                          .MACRO  LINEUP  EABITS  ; LINE UP EA BITS FOR RHCS1
 703                                  ;       LINEUP  EABITS          ; LINE UP EA BITS FOR RHCS1
 704                                          .NLIST
 705                                          MOV     EABITS,R0       ; GET EXTENDED MEMORY BITS
 706                                          ASL     R0              ; SHIFT 4 PLACES TO THE LEFT
 707                                          ASL     R0              ; TO LINE UP WITH RHCS1
 708                                          ASL     R0              ;
 709                                          ASL     R0              ;
 710                                          MOV     R0,XMEM         ; SAVE THE SHIFTED BITS
 711                                          .LIST
 712                                          .ENDM   LINEUP
 713
 714
 715  002726' 012767  000161  176266  WRITE:  MOV     #161,FUNC       ; LOAD WRITE FUNCTION
 716  002734' 012767  002726' 176266          MOV     #WRITE,FERADR   ;SAVE WHERE WE WERE
 717  002742' 016746  175174                  MOV     WBUFSZ,-(SP)    ;GET WRITE SIZE
 718  002746' 005416                          NEG     (SP)            ;NEGATE IT
 719  002750' 012677  177346                  MOV     (SP)+,@RHWC     ; LOAD WORD COUNT
 720  002754' 016777  175154  177342          MOV     WBUFPA,@RHBA    ; LOAD BUFFER ADDRESS
 721  002762' 016777  176200  177336          MOV     DSKADR,@RPDA    ; LOAD DISK ADDRESS
 722  002770' 016777  176166  177356          MOV     CYLNDR,@RPDC    ; LOAD CYLINDER ADDRESS                 ;DRB001
 723                                  ;       LINEUP  WBUFEA          ; LINE UP EA BITS FOR RHCS1
 724  003016' 000167  000302                  JMP     GO              ; CONTINUE
 725  003022' 012767  000151  176172  WRITCK: MOV     #151,FUNC       ; LOAD WRITE-CHECK FUNCTION
 726  003030' 012767  003022' 176172          MOV     #WRITCK,FERADR  ;SAVE WHERE WE WERE
 727  003036' 016746  175100                  MOV     WBUFSZ,-(SP)    ;GET WRITE SIZE
 728  003042' 005416                          NEG     (SP)            ;NEGATE IT
 729  003044' 012677  177252                  MOV     (SP)+,@RHWC     ; LOAD WORD COUNT
 730  003050' 016777  175060  177246          MOV     WBUFPA,@RHBA    ; LOAD BUFFER ADDRESS
 731  003056' 016777  176104  177242          MOV     DSKADR,@RPDA    ; LOAD DISK ADDRESS
 732  003064' 016777  176072  177262          MOV     CYLNDR,@RPDC    ; LOAD CYLINDER ADDRESS                 ;DRB001
 733                                  ;       LINEUP  WBUFEA          ; LINE UP EA BITS FOR RHCS1
 734  003112' 000167  000206                  JMP     GO              ; CONTINUE
 735  003116' 012767  000171  176076  READ:   MOV     #171,FUNC       ; LOAD READ FUNCTION
 736  003124' 012767  003116' 176076          MOV     #READ,FERADR    ;SAVE WHERE WE WERE
 737  003132' 016746  174774                  MOV     RBUFSZ,-(SP)    ;GET READ SIZE
 738  003136' 005416                          NEG     (SP)            ;NEGATE IT
 739  003140' 012677  177156                  MOV     (SP)+,@RHWC     ; LOAD WORD COUNT
 740  003144' 016777  174756  177152          MOV     RBUFPA,@RHBA    ; LOAD BUFFER ADDRESS
 741  003152' 016777  176010  177146          MOV     DSKADR,@RPDA    ; LOAD DISK ADDRESS
 742  003160' 016777  175776  177166          MOV     CYLNDR,@RPDC    ; LOAD CYLINDER ADDRESS                 ;DRB001
 743                                  ;       LINEUP  RBUFEA          ; LINE UP EA BITS FOR RHCS1
 744  003206' 000167  000112                  JMP     GO              ; CONTINUE
 745  003212' 016777  176000  177110  RELEASE: MOV     UNITNO,@RHCS2   ;SET UP UNIT TO RELEASE                 ;DRB001
 746  003220' 012777  000013  177072          MOV     #13,@RHCS1      ;EXECUTE RELEASE COMMAND                ;DRB001
 747  003226' 104407  000000'                 BREAK$,BEGIN            ;TEMPORARY RETURN TO MONITOR....
 748  003232' 104407  000000'                 BREAK$,BEGIN            ;THEN CONTINUE AT NEXT INSTRUCTION.
 749  003236' 000207                          RTS     PC              ;IT'S RELEASED                          ;DRB001
 750                                                                          ;**-33                          ;DRB001
 751
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  752  003240' 016777  175752  177062  CLEAR:  MOV     UNITNO,@#RHCS2  ; LOAD UNIT ADDRESS
  753  003246' 012777  000011  177044          MOV     #11,@#RHCS1     ; ISSUE A DRIVE CLEAR
  754  003254' 000240                          NOP                     ;WAIT
  755  003256' 000240                          NOP                     ;FOR DRIVE CLEAR TO FINISH
  756  003260' 012777  000023  177032          MOV     #23,@#RHCS1     ;ISSUE A PACK ACK
  757  003266' 105777  177026          1$:     TSTB    @#RHCS1
  758  003272' 100401                          BMI     2$
  759  003274' 000774                          BR      1$              ; NO, WAIT TILL DONE
  760  003276' 017746  177034          2$:     MOV     @#RPAS,-(SP)    ;CLEAR AS BIT
  761  003302' 012677  177030                  MOV     (SP)+,@#RPAS
  762  003306' 012777  040000  177004          MOV     #BIT14,@#RHCS1  ; CLEAR ANY CONTROLLER ERRORS
  763  003314' 012777  010000  177030          MOV     #BIT12,@#RPOF   ; SET BIT FOR 11 FORMAT
  764  003322' 000205                          RTS     R5              ; RETURN
  765
  766  003324' 016777  175666  176776  GO:     MOV     UNITNO,@#RHCS2  ; LOAD UNIT SELECT
  767  003332' 032767  001000  174516          BIT     #ADDR22,PES1    ;22 BIT SUPPORT?                        ;DRB001
  768  003340' 001434                          BEQ     1$              ;NO                                     ;DRB001
  769  003342' 017767  176756  175556          MOV     @#RHBA,PA18     ;GET 18 BIT ADDR
  770  003350' 006267  175554                  ASR     XMEM            ;SHIFT PA BITS TO POSITION 4,5
  771  003354' 006267  175550                  ASR     XMEM
  772  003360' 006267  175544                  ASR     XMEM
  773  003364' 006267  175540                  ASR     XMEM
  774  003370' 104416  000000' 001126'         MAP22$, BEGIN,PA18              ; GET 22-BIT ADDR FROM 18-BIT ADDR
  775  003376' 016777  175530  176720          MOV     PA22,@#RHBA     ;LOAD BA REG
  776  003404' 016777  175524  176756          MOV     EA22,@#RHBAE    ;LOAD BAE REG
  777  003412' 042767  000034  175514          BIC     #34,EA22        ;CLEAR UNWANTED BITS
  778  003420' 000367  175510                  SWAB    EA22            ;LOAD INTO BITS 8,9
  779  003424' 016767  175504  175476          MOV     EA22,XMEM       ;LOAD XMEM TO SET INTO FUNCTION CODE
  780  003432' 056767  175472  175562  1$:     BIS     XMEM,FUNC       ; LOAD EXTENDED MEMORY BITS
  781  003440' 016777  175556  176652          MOV     FUNC,@#RHCS1    ; EXECUTE THE FUNCTION
  782  003446' 104400  000000'                 EXIT$S,BEGIN                    ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
  783  003452' 010046                  NTRUPT: MOV     R0,-(SP)        ;SAVE R0
  784  003454' 016700  175536                  MOV     UNITNO,R0
  785  003460' 116000  003670'                 MOVB    BITTAB(R0),R0
  786  003464' 017746  176646                  MOV     @#RPAS,-(SP)
  787  003470' 040016                          BIC     R0,(SP)
  788  003472' 012677  176640                  MOV     (R6)+,@#RPAS
  789  003476' 012600                          MOV     (SP)+,R0
  790                                          ;---------------------------------------------------------------
  791  003500' 000004  000000' 003506'         PIRQ$,BEGIN,1$          ; QUEUE UP TO CONTINUE AT 1$ AND RTI
  792                                          ;---------------------------------------------------------------
  793
  794  003506' 004767  003336          1$:     JSR     PC,ERRORS       ;GO CHECK FOR ERRORS
  795  003512' 103401                          BCS     2$              ;ERRORS DETECTED                        ;DRB001
  796  003514' 000205                          RTS     R5              ;OTHERWISE,  RETURN OK
  797  003516'                         2$:
  798
  799  003516' 105767  175516                  TSTB    HRDERR          ;DON'T RETRY ON HARD ERROR      REV D
  800  003522' 100422                          BMI     4$                                              ;DRB001
  801  003524' 005267  175504                  INC     TRY             ;COUNT AN ERROR
  802  003530' 026727  175500  000003          CMP     TRY,#3          ;TOO MANY FOR THIS CYCLE?               ;DRB001
  803  003536' 002007                          BGE     5$              ;BR IF SO
  804  003540' 004567  003750                  JSR     R5,READY        ; MAKE SURE WE HAVE THE DISK            ;RMDB
  805  003544' 103402                          BCS     6$                                              ;RMDB
  806  003546' 004767  003544                  JSR     PC,NOTRDY                                       ;RMDB
  807  003552' 000177  175452          6$:     JMP     @#ERADR         ;RE-EXECUTE THE DRIVER ROUTINE          ;DRB001 ;RMDB
```



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  808  003556' 104403  000000' 012216'  5$:     ASGN$,BEGIN,EXCED
  809  003564' 004767  003370                  JSR     PC,BAD          ;UPDATE BAD BLOCK INFO.
  810  003570' 012605                  4$:     MOV     (SP)+,R5        ;RESTORE R5
  811                                                                  ;**-7                                   ;DRB001
  812  003572' 004767  000102          3$:     JSR     PC,PICKBR       ;TRY A DIFFERENT BLOCK
  813  003576' 005367  175414                  DEC     UNITNO          ;WANT TO RE-DO SAME DRIVE WERE ON
  814  003602' 000167  177016                  JMP     LOOP2           ;GO DO IT
  815                                                                  ;**-2                                   ;DRB001
  816
  817                                  ;       ------------------------
  818
  819                                                                  ;**-17                                  ;DRB001
  820
  821  003606'                         PICKDR:
  822  003606' 005267  175404          1$:     INC     UNITNO          ;POINT TO NEXT DRIVE
  823  003612' 026727  175400  000010          CMP     UNITNO,#8.              ;DONE LOOKING?
  824  003620' 001002                          BNE     2$              ;BR IF NO, ELSE
  825  003622' 000261                          SEC                     ;SET CARRY FOR NO-MORE-DRIVES           ;DRB001
  826  003624' 000420                          BR      5$              ;EXIT ROUTINE                           ;DRB001
  827  003626' 016700  175364          2$:     MOV     UNITNO,R0       ;USE AS AN INDEX
  828  003632' 136067  003670' 175352          BITB    BITTAB(R0),DVICE        ;TEST THIS DEVICE?
  829  003640' 001001                          BNE     3$              ;BR IF YES, ELSE
  830  003642' 000761                          BR      1$
  831  003644'                         3$:
  832                                                                  ;**-1                                   ;DRB001
  833  003644' 004567  003644                  JSR     R5,READY        ;SEE IF DRIVE IS READY
  834  003650' 103402                          BCS     4$              ;BR IF IT WAS READY                     ;DRB001
  835  003652' 004767  003440                  JSR     PC,NOTRDY       ;ELSE GO CLEAR IT AND CHECK AGAIN
  836  003656' 004767  000670          4$:     JSR     PC,GETDVT       ;IS THIS LEGAL DRIVE TYPE?              ;DRB001
  837  003662' 103751                          BCS     1$              ;ILLEGAL TYPE: DROPPED.  TRY NEXT       ;DRB001
  838  003664' 000241                          CLC                     ;RETURN, NEXT DRIVE AVAILABLE           ;DRB001
  839  003666' 000207                  5$:     RTS     PC              ;GO HOME                                ;DRB001
  840  003670' 001001                  BITTAB: 1001
  841  003672' 004004                          4004
  842  003674' 020020                          20020
  843  003676' 100100                          100100
  844
  845
  846  003700'                         PICKBR:                                 ;**-11                          ;DRB001
  847                                          ;(* FUNCTION: SELECT NEXT DISK ADDRESS TO TEST.       *)     ;DRB001
  848                                          ;(* AVOID WRITING OVER KNOWN BAD SPOTS OR DISK'S BAD  *)     ;DRB001
  849                                          ;(* SPOT FILE (IF OPERATOR TELLS US IT'S THERE).  CYL *)     ;DRB001
  850                                          ;(* IS "RELATIVE ADDRESS", MAX RANGE 0-410 (RP04/5) OR*)     ;DRB001
  851                                          ;(* 0-407 (RP06);  THIS IS MOVED TO CYLNDR AND INCRE- *)     ;DRB001
  852                                          ;(* MENTED TO SECOND HALF IF THIS COPY OF RPD IS IN   *)     ;DRB001
  853                                          ;(* PORT B MODE.                                      *)     ;DRB001
  854                                                                                                       ;DRB001
  855  003700' 032767  000040  174110          BIT     #NORAND,SR1     ;IF SEQUENTIAL SEEKS THEN               ;DRB001
  856  003706' 001403                          BEQ     1$              ;BEGIN                                  ;DRB001
  857  003710' 105267  175252                  INCB    SECTOR          ; SECTOR := SECTOR + 1                  ;DRB001
  858  003714' 000432                          BR      2$              ;END                                    ;DRB001
  859  003716'                         1$:                             ;ELSE (* RANDOM SEEKS *)                ;DRB001
  860                                                                  ;BEGIN (* FUDGE 3 UN-RELATED            ;DRB001
  861                                                                  ;  (* NUMBERS FROM 1 RAND CALL  *)      ;DRB001
  862  003716' 104417  000000'                 RAND$,BEGIN
  863  003722' 016700  174126                  MOV     RANNUM,R0       ; R0 := RANNUM                          ;DRB001
```

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 864  003726' 046700  175222            BIC     CYLMSK,R0       ; R0 := R0 MOD 1024.                    ;DRB001;WMRMRP
 865  003732' 010067  175226            MOV     R0,CYL          ; CYL := R0                             ;DRB001
 866  003736' 016700  174112            MOV     RANNUM,R0       ; "RECHARGE" R0                         ;DRB001
 867  003742' 000300                    SWAB    R0              ; R0<0:8> := R0<8:8>                    ;DRB001
 868  003744' 046700  175206            BIC     TRKMSK,R0       ; R0 := R0 MOD 32.                      ;DRB001;WMRMRP
 869  003750' 110067  175212            MOVB    R0,SECTOR       ; SECTOR := R0                          ;DRB001
 870  003754' 016700  174074            MOV     RANNUM,R0       ; AND AGAIN                             ;DRB001
 871  003760' 000241                    CLC                     ; CARRY := 0                            ;DRB001
 872  003762' 006100                    ROL     R0              ; CARRY := R0<15:1>                     ;DRB001
 873  003764' 006100                    ROL     R0                                                      ;DRB001
 874  003766' 006100                    ROL     R0              ;                                       ;DRB001
 875  003770' 006100                    ROL     R0              ;                                       ;DRB001
 876  003772' 046700  175162            BIC     SECMSK,R0       ; R0 := (R0<0:13>*8.) + R0<13:3>        ;DRB001;WMRMRP
 877                                                            ; (* NOTE: THE FORMULAE USED ARE *)      ;DRB001
 878                                                            ; (* ABSOLUTELY IRRELEVANT       *)      ;DRB001
 879  003776' 110067  175165            MOVB    R0,TRACK        ; TRACK := R0                           ;DRB001
 880  004002'                    2$:                             ;END                                    ;DRB001
 881  004002' 126767  175160  175140    CMPB    SECTOR,SECLIM   ;IF SECTOR TOO GREAT THEN               ;DRB001;WMRMRP
 882  004010' 003412                    BLE     3$              ;BEGIN                                  ;DRB001
 883  004012' 105267  175151            INCB    TRACK           ; TRACK := TRACK + 1                    ;DRB001
 884  004016' 016700  175144            MOV     SECTOR,R0       ; R0 := SECTOR                          ;DRB001
 885  004022' 016701  175124            MOV     SECLM1,R1       ; R1 := # OF SECTORS IN TRACK           ;DRB001;WMRMRP
 886  004026' 004767  001370            JSR     PC,MODULUS      ; R0 := R0 MOD R1                       ;DRB001
 887  004032' 110067  175130            MOVB    R0,SECTOR       ; SECTOR := R0                          ;DRB001
 888  004036'                    3$:                             ;END                                    ;DRB001
 889                                    ;(* NOW, CUT VALUES DOWN TO LEGAL RANGES FOR CURRENT DRIVE TYPE *) ;DRB001
 890  004036' 126767  175125  175100    CMPB    TRACK,TRKLIM    ;IF TRACK TOO GREAT THEN                ;DRB001;WMRMRP
 891  004044' 003412                    BLE     4$              ;BEGIN                                  ;DRB001
 892  004046' 005267  175112            INC     CYL             ; CYL := CYL + 1                        ;DRB001
 893  004052' 116700  175111            MOVB    TRACK,R0        ; R0 := TRACK                           ;DRB001
 894  004056' 016701  175064            MOV     TRKLM1,R1       ; R1 := TRK LIMIT +1                    ;DRB001;WMRMRP
 895  004062' 004767  001334            JSR     PC,MODULUS      ; R0 := R0 MOD R1                       ;DRB001
 896  004066' 110067  175075            MOVB    R0,TRACK        ; TRACK := R0                           ;DRB001
 897  004072'                    4$:                             ;END                                    ;DRB001
 898  004072' 026767  175066  175040    CMP     CYL,CYLLIM      ;IF CYL GT # OF CYLINDERS IN RANGE THEN ;DRB001
 899  004100' 002420                    BLT     5$              ;BEGIN                                  ;DRB001
 900  004102' 032767  000040  173706    BIT     #NORAND,SR1     ; IF SEQUENTIAL SEEKS THEN              ;DRB001
 901  004110' 001404                    BEQ     6$              ; BEGIN                                 ;DRB001
 902  004112' 005067  175046            CLR     CYL             ;  RESET CYLINDER                       ;DRB001
 903  004116' 005067  175044            CLR     DSKADR          ;  TRACK := 0, SECTOR := 0              ;DRB001
 904  004122'                    6$:                             ; ELSE                                  ;DRB001
 905                                                            ; BEGIN                                 ;DRB001
 906  004122' 016700  175036            MOV     CYL,R0          ;  R0 := CYL                            ;DRB001
 907  004126' 016701  175006            MOV     CYLLIM,R1       ;  R1 := CYLLIM                         ;DRB001
 908  004132' 004767  001264            JSR     PC,MODULUS      ;  R0 := R0 MOD R1                      ;DRB001
 909  004136' 010067  175022            MOV     R0,CYL          ;  CYL := R0                            ;DRB001
 910  004142'                    7$:                             ; END                                   ;DRB001
 911  004142'                    5$:                             ;END                                    ;DRB001
 912  004142' 016767  175016  175012    MOV     CYL,CYLNDR      ;CYLNDR := CYL                          ;DRB001
 913  004150' 032767  000020  173640    BIT     #BPORT,SR1      ;IF BPORT AND DUAL PORT THEN            ;DRB001
 914  004156' 001407                    BEQ     8$              ;BEGIN                                  ;DRB001
 915  004160' 032767  000001  175022    BIT     #BITO,FLAG      ;                                       ;DRB001
 916  004166' 001403                    BEQ     8$              ;                                       ;DRB001
 917  004170' 066767  174744  174764    ADD     CYLLIM,CYLNDR   ; INCREMENT TO SECOND HALF OF DISK      ;DRB001
 918  004176'                    8$:                             ;END                                    ;DRB001
 919  004176' 026767  174760  174772    CMP     CYLNDR,LASCYL   ;IF CYLNDR GT LASCYL THEN               ;DRB001
```



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 920  004204' 003431                    BLE     20$             ;BEGIN          ;REV. 00
 921  004206' 016767  174764  174746    MOV     LASCYL,CYLNDR   ; CYLNDR := LASCYL (* TRUNCATE *)       ;DRB001
 922  004214' 032767  000040  173574    BIT     #NORAND,SR1     ; IF SEQUENTIAL THEN                    ;DRB001
 923  004222' 001404                    BEQ     10$             ; BEGIN                                 ;DRB001
 924  004224' 005067  174734            CLR     CYL             ;  RESET CYLINDER                       ;DRB001
 925  004230' 005067  174732            CLR     DSKADR          ;  TRACK := 0, SECTOR := 0              ;DRB001
 926  004234'                    10$:                            ; END                                   ;DRB001
 927  004234' 126767  174727  174736    CMPB    TRACK,LASTRK    ; IF TRACK GT LASTRK THEN               ;DRB001
 928  004242' 003412                    BLE     11$             ; BEGIN                                 ;DRB001
 929  004244' 116767  174730  174715    MOVB    LASTRK,TRACK    ;  TRACK := LASTRK                      ;DRB001
 930  004252' 126767  174710  174722    CMPB    SECTOR,LASSEC   ;  IF SECTOR GT LASSEC THEN             ;DRB001
 931  004260' 003403                    BLE     12$             ;  BEGIN                                ;DRB001
 932  004262' 116767  174714  174676    MOVB    LASSEC,SECTOR   ;   SECTOR := LASSEC                    ;DRB001
 933  004270'                    12$:                            ;  END                                  ;DRB001
 934  004270'                    11$:                            ; END                                   ;DRB001
 935
 936  004270'                    20$:                                                                    ;DRB001
 937                                                                                                     ;DRB001
 938                                    ;(* NOW, CHECK BADSPOT TABLE *)                                  ;DRB001
 939  004270' 012700  000252'            MOV     #BADSPT,R0      ;R0 := ADDRESS OF TABLE                 ;DRB001
 940  004274' 016701  174636            MOV     NXTBAD,R1       ;R1 := END OF TABLE                     ;DRB001
 941  004300' 116702  174662            MOVB    SECTOR,R2       ;R2 := SECTOR                           ;DRB001
 942  004304' 116703  174657            MOVB    TRACK,R3        ;R3 := TRACK                            ;DRB001
 943  004310' 016704  174646            MOV     CYLNDR,R4       ;R4 := CYLNDR                           ;DRB001
 944                                    ;(* CALCULATE UPPER LIMIT OF THIS WRITE *)                       ;DRB001
 945  004314' 066702  174666            ADD     SIZSEC,R2       ;R2 := R2 + # OF SECTORS IN WRITE        ;DRB001
 946  004320' 020267  174624            CMP     R2,SECLIM       ;IF R2 GT SECTOR LIMIT THEN             ;DRB001;WMRMRP
 947  004324' 003401                    BLE     13$             ;BEGIN                                  ;DRB001
 948  004326' 005203                    INC     R3              ; R3 := R3 + 1 (INCR. UPPER TRACK)      ;DRB001
 949                                                                                                             ;RMDB
 950  004330'                    13$:                            ;END                                    ;DRB001
 951  004330' 066703  174650            ADD     SIZTRK,R3       ;R3 := R3 + TRKSIZ                      ;DRB001
 952  004334' 020367  174604            CMP     R3,TRKLIM       ;IF R3 GT TRACK LIMIT THEN              ;DRB001;WMRMRP
 953  004340' 003401                    BLE     14$             ;BEGIN                                  ;DRB001
 954  004342' 005204                    INC     R4              ; R4 := R4 + 1 (INCR. UPPER CYLINDER)   ;DRB001
 955                                                                                                             ;RMDB
 956  004344'                    14$:                            ;END                                    ;DRB001
 957  004344' 020001                    15$:    CMP     R0,R1           ;WHILE R0 LT R1 DO              ;DRB001
 958  004346' 002030                    BGE     16$             ;BEGIN                                  ;DRB001
 959  004350' 026710  174606            CMP     CYLNDR,(R0)     ; IF CYLNDR LE (R0) AND R4 GE (R0)      ;DRB001
 960  004354' 003022                    BGT     17$             ;  AND TRACK LE 3(R0) AND R3 GE 3(R0)   ;DRB001
 961  004356' 020410                    CMP     R4,(R0)         ;  AND SECTOR LE 2(R0) AND R2 GE 2(R0) THEN;DRB001
 962  004360' 002420                    BLT     17$             ;                                       ;DRB001
 963  004362' 126760  174601  000003    CMPB    TRACK,3(R0)     ;                                       ;DRB001
 964  004370' 003014                    BGT     17$                                                     ;DRB001
 965  004372' 120360  000003            CMPB    R3,3(R0)        ;                                       ;DRB001
 966  004376' 002411                    BLT     17$             ;                                       ;DRB001
 967  004400' 126760  174562  000002    CMPB    SECTOR,2(R0)    ;                                       ;DRB001
 968  004406' 003005                    BGT     17$             ;                                       ;DRB001
 969  004410' 120260  000002            CMPB    R2,2(R0)        ;                                       ;DRB001
 970  004414' 002402                    BLT     17$             ; BEGIN                                 ;DRB001
 971  004416' 000167  177256            JMP     PICKBK          ;  TRY ANOTHER SECTOR                   ;DRB001
 972  004422'                    17$:                            ; END                                   ;DRB001
 973  004422' 062700  000004            ADD     #4,R0           ; INCREMENT TO NEXT BAD SPOT            ;DRB001
 974  004426' 000746                    BR      15$             ;END                                    ;DRB001
 975  004430'                    16$:                            ;                                       ;DRB001
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 976  004430' 000207                         RTS     PC              ;CPU GO HOME!!!!                                ;DRB001
 977                                                                                                                    ;DRB001
 978                                                                                                                    ;DRB001
 979  004432'                                WRTLIM:                                                                    ;DRB001
 980                                                 ;(* WE ALLOW USER TO CHANGE WBUFSZ "AT WILL"--THEREFORE *)      ;DRB001
 981                                                 ;(* WE DO NOT AUTOMATICALLY KNOW THE TRANSFER SIZE.    *)      ;DRB001
 982                                                 ;(* COMPUTATION IS MADE EASIER, FURTHERMORE, IF WE HAVE *)      ;DRB001
 983                                                 ;(* THE SIZE BROKEN INTO TRACKS AND SECTORS (SINCE      *)      ;DRB001
 984                                                 ;(* WBUFSZ IS ONE WORD, THE TRANSFER CAN'T BE GREATER   *)      ;DRB001
 985                                                 ;(* THAN 12 TRACKS).  THIS ROUTINE ALSO CALCULATES THE  *)      ;DRB001
 986                                                 ;(* UPPER LIMITS ON DISK WRITES SO AS NOT TO OVERFLOW   *)      ;DRB001
 987                                                 ;(* HIGH CYLINDER.                                      *)      ;DRB001
 988                                                                                                                    ;DRB001
 989  004432' 016700  173504                        MOV     WBUFSZ,R0       ;R0 := ALLOCATED WRITE BUFFER           ;DRB001
 990  004436' 000300                                 SWAB    R0              ;R0 := R0 / 256.                        ;DRB001
 991  004440' 042700  177400                        BIC     #177400,R0      ; (* R0 IS WBUFSZ IN SECTORS *)           ;DRB001
 992  004444' 005067  174534                        CLR     SIZTRK          ;SIZTRK := 0                            ;DRB001
 993  004450' 020067  174476              1$:       CMP     R0,SECLM1       ;WHILE R0 GT SEC LIMIT DO               ;DRB001;WMRMRP
 994  004454' 002405                                BLT     2$              ;BEGIN                                  ;DRB001
 995  004456' 105267  174522                        INCB    SIZTRK          ; SIZTRK := SIZTRK + 1                  ;DRB001
 996  004462' 166700  174464                        SUB     SECLM1,R0       ; DECREMENT SECTORS BY 1 TRACK          ;DRB001;WMRMRP
 997  004466' 000770                                BR      1$              ;END                                    ;DRB001
 998  004470' 010067  174512              2$:       MOV     R0,SIZSEC       ;SIZSEC := REMAINDER                    ;DRB001
 999  004474' 016701  174444                        MOV     TRKLIM,R1       ;R1 := HIGH TRACK                       ;DRB001;WMRMRP
1000  004500' 016702  174444                        MOV     SECLIM,R2       ;R2 := HIGH SECTOR                      ;DRB001;WMRMRP
1001  004504' 160002                                SUB     R0,R2           ;R2 := R2 - SIZSEC                      ;DRB001
1002  004506' 005702                                TST     R2              ;IF R2 LT 0 THEN                        ;DRB001
1003  004510' 002003                                BGE     3$              ;BEGIN                                  ;DRB001
1004  004512' 066702  174434                        ADD     SECLM1,R2       ; INCREMENT BACK UP                     ;DRB001;WMRMRP
1005  004516' 005301                                DEC     R1              ; CAN'T FIT THAT LAST TRACK...          ;DRB001
1006  004520'                              3$:                               ;END                                    ;DRB001
1007  004520' 166701  174460                        SUB     SIZTRK,R1       ;R1 := R1 - SIZTRK                      ;DRB001
1008  004524' 005701                                TST     R1              ;IF R1 LT 0 THEN                        ;DRB001
1009  004526' 002004                                BGE     4$              ;BEGIN                                  ;DRB001
1010  004530' 066701  174412                        ADD     TRKLM1,R1       ; INCREMENT R1 BACK UP                  ;DRB001;WMRMRP
1011  004534' 005367  174436                        DEC     LASCYL          ; LASCYL := LASCYL - 1                  ;DRB001
1012  004540'                              4$:                               ;END                                    ;DRB001
1013  004540' 010167  174434                        MOV     R1,LASTRK       ;LASTRK := HIGHEST TRACK WE CAN WRITE   ;DRB001
1014  004544' 010267  174432                        MOV     R2,LASSEC       ;LASSEC := HIGHEST SECTOR WE CAN WRITE  ;DRB001
1015  004550' 000207                                RTS     PC              ;END OF ROUTINE                         ;DRB001
1016  004552'                              GETDVT:                                                                   ;DRB001
1017                                                                                                                   ;DRB001
1018                                                ;(* FIND WHICH TYPE OF DRIVE THIS IS.  IF RP04/5, SET CYLLIM *) ;DRB001
1019                                                ;(* TO 206.  IF RP06, SET CYLLIM TO 408.  DROP THE DRIVE IF  *) ;DRB001
1020                                                ;(* IT IS NOT A RP04/5/6 OR RM02/3                   *)    ;DRB001
1021  004552' 016777  174440  175550                MOV     UNITNO,@#RHCS2  ;SELECT THE DRIVE                       ;DRB001
1022                                                                                                                   ;DRB001
1023                                                                        ;                                                   ;RMDB5
1024                                                                        ; THE FOLLOWING RPDT CHECKS WERE        ;WMRMRP ;RMDB5
1025                                                                        ; INCLUDED FOR RM05 SUPPORT             ;WMRMRP ;RMDB5
1026  004560' 027727  175562  024027        525$:   CMP     @#RPDT,#24027   ;                                       ;WMRMRP ;RMDB5
1027  004566' 001012                                BNE     512$            ; CHECK FOR RM05 DUAL PORT              ;WMRMRP ;RMDB5
1028  004570' 052767  000001  174412        511$:   BIS     #B110,FLAG      ; NO                                    ;WMRMRP ;RMDB5
1029  004576' 012767  000633  174334                MOV     #411.,CYLLIM    ; SET DUAL PORT BIT                     ;WMRMRP ;RMDB5
1030  004604' 012767  001465  174364                MOV     #821.,LASCYL    ; SET CYLINDER LIMIT = 411.              ;RMDB5
1031  004612' 000415                                BR      514$            ; SET LASCYL = 821. (DISK HIGH LIMIT)    ;RMDB5
                                                                              ; NOW GO FINISH UP                       ;RMDB5
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1032  004614' 027727  175526  020027        512$:   CMP     @#RPDT,#20027   ; CHECK FOR RM05 SINGLE PORT              ;RMDB5
1033  004622' 001042                                BNE     515$            ; NO                                    ;RMDB5
1034  004624' 042767  000001  174356        513$:   BIC     #B110,FLAG      ; SET TO SINGLE PORT                    ;RMDB5
1035  004632' 012767  001466  174300                MOV     #822.,CYLLIM    ; SET CYLINDER TO 822.                  ;RMDB5
1036  004640' 012767  001465  174330                MOV     #821.,LASCYL    ; SET DISK HIGH LIMIT TO 821.           ;RMDB5
1037  004646' 012767  000004  174266        514$:   MOV     #4,TYPFLG       ; SET DRIVE TYPE FLAG TO RM05           ;RMDB5
1038  004654' 012767  176000  174272                MOV     #176000,CYLMSK  ; SET MASK FOR RM05 CYLINDER             ;RMDB5
1039  004662' 012767  177740  174266                MOV     #177740,TRKMSK  ; SET MASK FOR RM05 TRACK                ;RMDB5
1040  004670' 012767  177740  174262                MOV     #177740,SECMSK  ; SET MASK FOR RM05 SECTOR MASK          ;RMDB5
1041  004676' 012767  000022  174240                MOV     #18.,TRKLIM     ; SET TRACK LIMIT FOR RM05              ;RMDB5
1042  004704' 012767  000023  174234                MOV     #19.,TRKLM1     ; SET TRACK LIMIT +1 FOR RM05           ;RMDB5
1043  004712' 012767  000037  174230                MOV     #31.,SECLIM     ; SET SECTOR LIMIT FOR RM05             ;RMDB5
1044  004720' 012767  000040  174224                MOV     #32.,SECLM1     ; SET SECTOR LIMIT FOR RM05             ;RMDB5
1045  004726' 000473                                BR      52$             ; GOTO 2$ IN 2 BR'S, 1 IS TOO FAR       ;RMDB5
1046                                                                          ;                                       ;RMDB5
1047  004730'                              515$:                             ; END OF THE RPDT CHECK ADDED CODE FOR RM05 ;RMDB5
1048                                                                        ;                                                   ;RMDB5
1049                                                                        ; THE FOLLOWING RPDT CHECKS WERE        ;WMRMRP
1050                                                                        ; INCLUDED FOR RM02/3 SUPPORT           ;WMRMRP
1051                                                                        ;                                       ;WMRMRP
1052  004730' 027727  175412  024024        25$:    CMP     @#RPDT,#24024   ; CHECK FOR RM03 DUAL PORT              ;WMRMRP
1053  004736' 001404                                BEQ     11$             ; YES                                   ;WMRMRP
1054  004740' 027727  175402  024025                CMP     @#RPDT,#24025   ; CHECK FOR RM02 DUAL PORT              ;WMRMRP
1055  004746' 001012                                BNE     12$             ; NO                                    ;WMRMRP
1056  004750' 052767  000001  174232        11$:    BIS     #B110,FLAG      ; SET DUAL PORT BIT                     ;WMRMRP
1057  004756' 012767  000633  174154                MOV     #411.,CYLLIM    ; SET CYLINDER LIMIT = 411.             ;WMRMRP
1058  004764' 012767  001465  174204                MOV     #821.,LASCYL    ; SET LASCYL = 821. (DISK HIGH LIMIT)   ;WMRMRP
1059  004772' 000421                                BR      14$             ; NOW GO FINISH UP                      ;WMRMRP
1060  004774' 027727  175346  020024        12$:    CMP     @#RPDT,#20024   ; CHECK FOR RM03 SINGLE PORT            ;WMRMRP
1061  005002' 001404                                BEQ     13$             ; YES                                   ;WMRMRP
1062  005004' 027727  175336  020025                CMP     @#RPDT,#20025   ; CHECK FOR RM02 SINGLE PORT            ;WMRMRP
1063  005012' 001042                                BNE     15$             ; NO                                    ;WMRMRP
1064  005014' 042767  000001  174166        13$:    BIC     #B110,FLAG      ; SET TO SINGLE PORT                    ;WMRMRP
1065  005022' 012767  001466  174110                MOV     #822.,CYLLIM    ; SET CYLINDER TO 822.                  ;WMRMRP
1066  005030' 012767  001465  174140                MOV     #821.,LASCYL    ; SET DISK HIGH LIMIT TO 821.           ;WMRMRP
1067  005036' 012767  000002  174076        14$:    MOV     #2,TYPFLG       ; SET DRIVE TYPE FLAG TO RM02/3          ;RMDB5
1068  005044' 012767  176000  174102                MOV     #176000,CYLMSK  ; SET MASK FOR RM02/3 CYLINDER           ;WMRMRP
1069  005052' 012767  177740  174076                MOV     #177740,TRKMSK  ; SET MASK FOR RM02/3 TRACK              ;WMRMRP
1070  005060' 012767  177770  174072                MOV     #177770,SECMSK  ; SET MASK FOR RM02/3 SECTOR MASK        ;WMRMRP
1071  005066' 012767  000004  174050                MOV     #4.,TRKLIM      ; SET TRACK LIMIT FOR RM02/3            ;WMRMRP
1072  005074' 012767  000005  174044                MOV     #5.,TRKLM1      ; SET TRACK LIMIT +1 FOR RM02/3         ;WMRMRP
1073  005102' 012767  000037  174040                MOV     #31.,SECLIM     ; SET SECTOR LIMIT FOR RM02/3           ;WMRMRP
1074  005110' 012767  000040  174034                MOV     #32.,SECLM1     ; SET SECTOR LIMIT FOR RM02/3           ;WMRMRP
1075  005116' 000537                        52$:    BR      2$              ; WE GOT THE STUFF TO DO IT NOW - RETURN ;WMRMRP
1076                                                                        ;                                       ;WMRMRP
1077  005120'                              15$:                              ; END OF THE RPDT CHECK ADDED CODE      ;WMRMRP
1078                                                                        ;                                       ;WMRMRP
1079  005120' 027727  175222  024022                CMP     @#RPDT,#24022   ;IF IT IS AN RP06 DUAL PORT THEN        ;DRB001
1080  005126' 001012                                BNE     1$              ;BEGIN                                  ;DRB001
1081  005130' 052767  000001  174052                BIS     #B110,FLAG      ; DUAL PORT                             ;DRB001
1082  005136' 012767  000627  173774                MOV     #407.,CYLLIM    ; CYLLIM := 408.                        ;DRB001
1083  005144' 012767  001455  174024                MOV     #813.,LASCYL    ; LASCYL := DISK HIGH LIM               ;DRB001
1084  005152' 000471                                BR      5$              ; GO FINISH UP                          ;DRB001;WMRMRP
1085  005154'                              1$:                               ;ELSE                                   ;DRB001
1086  005154' 027727  175166  024021                CMP     @#RPDT,#24021   ;IF IT IS RP04/5 DUAL PORT THEN         ;DRB001
1087  005162' 001404                                BEQ     3$              ;                                       ;DRB001
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1098  005164' 027727  175156  024020          CMP     @RPDT,#24020    ;                               ;DRB001
1099  005172' 001012                          BNE     4$              ;BEGIN                          ;DRB001
1100  005174'                           3$:                                                           ;DRB001
1101  005174' 052767  000001  174006          BIS     #BIT0,FLAG      ; DUAL PORT                     ;DRB001
1102  005202' 012767  000315  173730          MOV     #205.,CYLLIM    ; CYLLIM := 206.                ;DRB001
1103  005210' 012767  000631  173760          MOV     #409.,LASCYL    ; LASCYL := DISK HIGH LIM       ;DRB001
1104  005216' 000447                          BR      5$              ;END                            ;DRB001
1105  005220'                           4$:                           ;ELSE                           ;DRB001
1106  005220' 027727  175122  020022          CMP     @RPDT,#20022    ;IF RP06 SINGLE PORT THEN       ;DRB001
1107  005226' 001012                          BNE     6$              ;BEGIN                          ;DRB001
1108  005230' 042767  000001  173752          BIC     #BIT0,FLAG      ; SINGLE PORT                   ;DRB001
1109  005236' 012767  001456  173674          MOV     #814.,CYLLIM    ; CAN USE ENTIRE DISK           ;DRB001
1110  005244' 012767  001455  173724          MOV     #813.,LASCYL    ; LASCYL := DISK HIGH LIMIT     ;DRB001
1111  005252' 000431                          BR      5$              ; GO FINISH UP                  ;DRB001;WMRMRP
1112  005254'                           6$:                           ;ELSE                           ;DRB001
1113  005254' 027727  175066  020021          CMP     @RPDT,#20021    ;IF RP04/5 SINGLE PORT THEN     ;DRB001
1114  005262' 001404                          BEQ     8$              ;                               ;DRB001
1115  005264' 027727  175056  020020          CMP     @RPDT,#20020    ;                               ;DRB001
1116  005272' 001012                          BNE     9$              ;                               ;DRB001
1117  005274'                           8$:                           ;BEGIN                          ;DRB001
1118  005274' 042767  000001  173706          BIC     #BIT0,FLAG      ; SINGLE PORT                   ;DRB001
1119  005302' 012767  000632  173630          MOV     #410.,CYLLIM    ; USE ENTIRE DISK               ;DRB001
1120  005310' 012767  000631  173660          MOV     #409.,LASCYL    ; LASCYL := DISK HIGH LIMIT     ;DRB001
1121  005316' 000407                          BR      5$              ; GO FINISH UP                  ;DRB001;WMRMRP
1122  005320'                           9$:                           ;ELSE                           ;DRB001
1123                                                                  ;BEGIN                          ;DRB001
1124  005320' 004767  000130                  JSR     PC,DROP         ; DROP THE DRIVE                ;DRB001
1125  005324' 104403  000000' 012306'        MSGN$,BEGIN,BADTYP      ;ASCII MESSAGE CALL WITH COMMON HEADER
1126  005332' 000261                          SEC                     ; ERROR RETURN                  ;DRB001
1127  005334' 000431                          BR      7$              ;                               ;DRB001
1128  005336'                           5$:                           ;                               ;WMRMRP
1129                                                                  ; THE FOLLOWING WERE ADDED WHEN  ;WMRMRP
1130                                                                  ; SUPPORT FOR THE RM02/3 WAS INCLUDED ;WMRMRP
1131                                                                  ;                               ;WMRMRP
1132  005336' 012767  000001  173576          MOV     #1,TYPFLG       ; SET DRIVE TYPE FLAG TO RP     ;WMRMRP ;RMDB5
1133  005344' 012767  176000  173602          MOV     #176000,CYLMSK  ; SET MASK FOR RP04/5/6 CYL     ;WMRMRP
1134  005352' 012767  177740  173576          MOV     #177740,TRKMSK  ; SET MASK FOR RP04/5/6 TRACK   ;WMRMRP
1135  005360' 012767  177740  173572          MOV     #177740,SECMSK  ; SET MASK FOR RP04/5/6 SECTOR  ;WMRMRP
1136  005366' 012767  000022  173550          MOV     #18.,TRKLIM     ; SET THE TRACK LIMIT FOR THE RP'S ;WMRMRP
1137  005374' 012767  000023  173544          MOV     #19.,TRKLM1     ; SET THE TRACK LIMIT +1 FOR THE RP'S ;WMRMRP
1138  005402' 012767  000025  173540          MOV     #21.,SECLIM     ; SET THE SECTOR LIMIT FOR THE RP'S ;WMRMRP
1139  005410' 012767  000026  173534          MOV     #22.,SECLM1     ; SET THE SECTOR LIMIT +1 FOR THE RP'S ;WMRMRP
1140                                                                  ;                               ;WMRMRP
1141                                                                  ; END OF ADDED CODE             ;WMRMRP
1142                                                                  ;                               ;WMRMRP
1143  005416'                           2$:                           ;                               ;DRB001
1144  005416' 000241                          CLC                     ;NO ERROR                       ;DRB001
1145  005420'                           7$:                           ;                               ;DRB001
1146  005420' 000207                          RTS     PC              ;RETURN                         ;DRB001
1147  005422'                           MODLUS:                                                       ;DRB001
1148                                        ;(* THIS LITTLE ROUTINE COMPUTES R0 MODULUS R1      *)   ;DRB001
1149                                        ;(*  I.E., THE REMAINDER OF R0/R1, AND RETURNS THE  *)   ;DRB001
1150                                        ;(* ANSWER IN R0.                                  *)   ;DRB001
1151  005422' 020001                    1$:   CMP     R0,R1           ;WHILE R0 GE R1 DO              ;DRB001
1152  005424' 002402                          BLT     2$              ;BEGIN                          ;DRB001
1153  005426' 160100                          SUB     R1,R0           ; R0 := R0-R1                   ;DRB001
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1154  005430' 000774                          BR      1$              ;END                            ;DRB001
1155  005432'                           2$:                           ;                               ;DRB001
1156  005432' 000207                          RTS     PC              ;THAT'S ALL                     ;DRB001
1157
1158  005434' 012700  001242'         CLRRB:  MOV     #RBUF,R0        ;CLEAR RBUF BUFFER
1159  005440' 016701  172466                  MOV     RBUFSZ,R1       ;GET ITS ADDR AND SIZE
1160  005444' 005020                  CLRCOM: CLR     (R0)+           ;CLEAR ANOTHER
1161  005446' 005301                          DEC     R1              ;COUNT ANOTHER
1162  005450' 001375                          BNE     CLRCOM          ;BR BACK TILL DONE
1163  005452' 000207                          RTS     PC
1164
1165  005454' 012701  000001          DROP:   MOV     #1,R1           ; INITIALIZE DROP PICKER
1166  005460' 016700  173532                  MOV     UNITNO,R0       ; GET THE DRIVE NUMBER
1167  005464' 001403                          BEQ     2$              ; IF DRIVE 0 GO DROP IT
1168  005466' 006301                  1$:     ASL     R1              ; POINT TO NEXT DRIVE
1169  005470' 005300                          DEC     R0              ; IS THIS THE ONE ?
1170  005472' 001375                          BNE     1$              ; NO, LOOK AGAIN
1171  005474' 040167  173512          2$:     BIC     R1,DVICE        ; DROP THE DRIVE
1172                                          ;*****************************************************************
1173                                                                  ;CONVERT UNITNO TO ASCII AND
1174                                                                  ;STORE AT ADR1
1175  005500' 104420  000000' 001216'        OTOA$,BEGIN,UNITNO,ADR1
1176  005506' 012516'
1177                                          ;*****************************************************************
1178  005510' 000207                          RTS     PC              ; RETURN
1179                                  ;       ------------------------
1180
1181
1182
1183
1184                                          ;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
1185                                          ;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
1186
1187                                                  ;R E V  D       ;MCP
1188
1189
1190
1191
1192
1193  005512' 005067  000464          ERROR:  CLR     DLTFLG          ;INITIALIZE DLT FLAG
1194  005516' 104403  000000' 012470'        MSGN$,BEGIN,ASTER       ;ASCII MESSAGE CALL WITH COMMON HEADER
1195  005524' 005067  173510                  CLR     HRDERR                  ;RESET ERROR INDICATOR
1196  005530' 032767  100000  173324          BIT     #BIT15,S+10             ;
1197  005536' 001417                          BEQ     14$                     ;
1198  005540' 005267  173454                  INC     DLTCNT                  ;
1199  005544' 052767  000001  000430          BIS     #1,DLTFLG               ;SET FLAG FOR DATA LATE
1200  005552' 032767  000004  172236          BIT     #DLATE,SR1              ;
1201  005560' 001006                          BNE     14$                     ;
1202  005562' 052767  177777  173450          BIS     #-1,HRDERR              ;
1203  005570' 104403  000000' 012222'        MSGN$,BEGIN,DLTERR      ;ASCII MESSAGE CALL WITH COMMON HEADER
1204  005576' 032777  020000  174514  14$:   BIT     #BIT13,@RHCS1           ;MASSBUS CONTROL PARITY ERR?
1205  005604' 001406                          BEQ     5$
1206  005606' 052767  177777  173424          BIS     #-1,HRDERR              ;SET HARD ERR
1207  005614' 104403  000000' 012174'        MSGN$,BEGIN,MCPERR      ;ASCII MESSAGE CALL WITH COMMON HEADER
1208  005622' 032767  137400  173232  5$:     BIT     #HRDCS2,S+10            ;ANY ERRORS ?
1209  005630' 001402                          BEQ     1$
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 1200  005632' 004767  000346                JSR     PC,CHKCS2               ;GO SEE THE BITS
 1201  005636' 032767  040000  173220  1$:    BIT     #BIT14,S+12             ;ANY SET IN THE ERROR REG'S ?
 1202  005644' 001451                        BEQ     4$
 1203  005646' 032767  177777  173212        BIT     #HRDER1,S+14
 1204  005654' 001402                        BEQ     2$
 1205  005656' 004767  000464                JSR     PC,CHKER1
 1206  005662' 032767  000006  173252  2$:    BIT     #6,TYPFLG               ; TEST TO SEE IF THIS IS AN RM02/3/05   ;RMDB5
 1207  005670' 001413                        BEQ     30$                     ; NO - THEN CHECK RPER2 & RPER3         ;RMDB5
 1208  005672' 032767  176210  173214        BIT     #176210,S+42            ; RM - CHECK RMER2 HARD ERROR BITS      ;WMRMRP
 1209  005700' 001433                        BEQ     4$                      ; NO ERRORS IN RMER2 - CONTINUE         ;WMRMRP
 1210  005702' 052767  177777  173330        BIS     #-1,HRDERR              ; SET THE HARD ERROR FLAG               ;WMRMRP
 1211  005710' 104403  000000' 012320'        MSGNS,BEGIN,ER2ERR      ;ASCII MESSAGE CALL WITH COMMON HEADER
 1212  005716' 000424                        BR      4$                      ; CONTINUE                              ;WMRMRP
 1213  005720' 032767  167777  173164  30$:   BIT     #HRDER2,S+40            ;ANY ERRORS IN ER2
 1214  005726' 001406                        BEQ     3$
 1215  005730' 052767  177777  173302        BIS     #-1,HRDERR
 1216  005736' 104403  000000' 012320'        MSGNS,BEGIN,ER2ERR      ;ASCII MESSAGE CALL WITH COMMON HEADER
 1217  005744' 032767  140153  173142  3$:    BIT     #HRDER3,S+42            ;TEST ER3
 1218  005752' 001406                        BEQ     4$
 1219  005754' 052767  177777  173256        BIS     #-1,HRDERR              ;SET HARD ERRROR INDICATOR
 1220  005762' 104403  000000' 012324'        MSGNS,BEGIN,ER3ERR      ;ASCII MESSAGE CALL WITH COMMON HEADER
 1221  005770' 032767  040000  173064  4$:    BIT     #BIT14,S+10             ; WCE ?
 1222  005776' 001406                        BEQ     6$
 1223  006000' 052767  000002  000174        BIS     #2,DLTFLG               ;SET FLAG FOR SOFT TO BE USED IF DLT ALSO OCCURE
 1224  006006' 104403  000000' 012330'        MSGNS,BEGIN,WCEERR      ;ASCII MESSAGE CALL WITH COMMON HEADER
 1225  006014' 032767  040000  173030  6$:    BIT     #BIT14,S                ;IRE  ?
 1226  006022' 001406                        BEQ     7$
 1227  006024' 052767  000002  000150        BIS     #2,DLTFLG               ;SET SOFT FLAG
 1228  006032' 104403  000000' 012166'        MSGNS,BEGIN,IKERR       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1229  006040' 032767  100000  173004  7$:    BIT     #BIT15,S                ;SC ?
 1230  006046' 001406                        BEQ     8$
 1231  006050' 052767  000002  000124        BIS     #2,DLTFLG               ;SET FLAG
 1232  006056' 104403  000000' 012334'        MSGNS,BEGIN,SCERR       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1233  006064' 005767  172772        8$:     TST     S+10
 1234  006070' 100405                        BMI     10$
 1235  006072' 016767  174244  173136        MOV     RMDB,STORE
 1236  006100' 005067  174236                CLR     RMDB
 1237  006104' 005767  173130        10$:    TST     HRDERR                  ;ANNY HARD ERROR'S ?
 1238  006110' 100414                        BMI     12$                     ;IF TRUE THEN BR
 1239  006112' 032767  000001  000062        BIT     #1,DLTFLG               ;DLT ?  #DLATE IN SR1 MUST BE SET IF TRUE
 1240  006120' 001404                        BEQ     22$
 1241  006122' 022767  000003  000052        CMP     #3,DLTFLG               ;I; (SOFT & DLT NOT COUNTED )  ?
 1242  006130' 001007                        BNE     11$
 1243  006132'                        22$:
 1244                                        ;*****************************************************************
 1245  006132' 104406  000000' 002242'        SOFERS,BEGIN,TABLE      ;
 1246                                        ;*****************************************************************
 1247  006140' 000403                        BR      11$                     ;
 1248  006142'                        12$:
 1249                                        ;*****************************************************************
 1250  006142' 104405  000000' 002242'        HRDERS,BEGIN,TABLE      ;
 1251                                        ;*****************************************************************
 1252  006150' 005767  174166        11$:    TST     RMDB
 1253  006154' 001003                        BNE     9$
 1254  006156' 016767  173054  174156        MOV     STORE,RMDB
 1255  006164' 004767  001126        9$:     JSR     PC,NOTRDY
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 1256
 1257  006170' 104403  000000' 012470'        MSGNS,BEGIN,ASTER       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1258  006176' 000261                        SEC
 1259  006200' 000207                        RTS     PC
 1260
 1261  006202' 000000                DLTFLG: .WORD   0                       ;DLT FLAG TO BE USED FOR SOFT ERROR
 1262                                                                        ; & INHIBIT DLT COMPARISONS
 1263
 1264  006204' 052767  177777  173026  CHKCS2: BIS     #-1,HRDERR              ;SET HARD ERROR
 1265  006212' 104403  000000' 012340'        MSGNS,BEGIN,CS2HD       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1266  006220' 032767  020000  172634  1$:    BIT     #BIT13,S+10             ;UPE ?
 1267  006226' 001403                        BEQ     2$
 1268  006230' 104403  000000' 012344'        MSGNS,BEGIN,UPER        ;ASCII MESSAGE CALL WITH COMMON HEADER
 1269  006236' 032767  010000  172616  2$:    BIT     #BIT12,S+10             ;NED ?
 1270  006244' 001403                        BEQ     3$
 1271  006246' 104403  000000' 012350'        MSGNS,BEGIN,NEDER       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1272  006254' 032767  004000  172600  3$:    BIT     #BIT11,S+10             ;NXM ?
 1273  006262' 001403                        BEQ     4$
 1274  006264' 104403  000000' 012354'        MSGNS,BEGIN,NXM ;ASCII MESSAGE CALL WITH COMMON HEADER
 1275  006272' 032767  002000  172562  4$:    BIT     #BIT10,S+10
 1276  006300' 001403                        BEQ     5$
 1277  006302' 104403  000000' 012360'        MSGNS,BEGIN,PGERR       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1278  006310' 032767  001000  172544  5$:    BIT     #BIT9,S+10              ;MXF ?
 1279  006316' 001403                        BEQ     6$
 1280  006320' 104403  000000' 012364'        MSGNS,BEGIN,MXFER       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1281
 1282  006326' 032767  000400  172526  6$:    BIT     #BIT8,S+10
 1283  006334' 001403                        BEQ     7$
 1284  006336' 104403  000000' 012370'        MSGNS,BEGIN,MDPER       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1285  006344' 000207                7$:     RTS     PC
 1286
 1287  006346'                       CHKER1:
 1288  006346' 104403  000000' 012374'        MSGNS,BEGIN,ER1HD       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1289  006354' 032767  100000  172504        BIT     #BIT15,S+14             ;DATA CHECK ERROR ?
 1290  006362' 001406                        BEQ     1$
 1291  006364' 052767  000002  177610        BIS     #2,DLTFLG               ;SET SOFT ERR
 1292  006372' 104403  000000' 012400'        MSGNS,BEGIN,DCKER       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1293  006400' 032767  000020  172460  1$:    BIT     #BIT4,S+14              ;FORMAT ERROR ?
 1294  006406' 001423                        BEQ     2$
 1295  006410' 104403  000000' 012404'        MSGNS,BEGIN,FERER       ;ASCII MESSAGE CALL WITH COMMON HEADER
 1296  006416' 016767  172444  172612        MOV     S+14,STORE      ;SAVE ER1
 1297  006424' 042767  077757  172604        BIC     #77757,STORE
 1298  006432' 022767  100020  172576        CMP     #BIT15 ! BIT4,STORE
 1299  006440' 001003                        BNE     21$
 1300  006442' 052767  177777  172570        BIS     #-1,HRDERR              ;SET HARD ERROR INDICATOR
 1301  006450' 052767  000002  177524  21$:   BIS     #2,DLTFLG               ;SET SOFT ERR
 1302
 1303  006456' 032767  000400  172402  2$:    BIT     #BIT8,S+14              ;HCRC ?
 1304  006464' 001406                        BEQ     3$
 1305  006466' 052767  000002  177506        BIS     #2,DLTFLG               ;SET SOFT ERR
 1306  006474' 104403  000000' 012410'        MSGNS,BEGIN,HCRC        ;ASCII MESSAGE CALL WITH COMMON HEADER
 1307  006502' 032767  000200  172356  3$:    BIT     #BIT7,S+14              ;HEADER COMP ERR ?
 1308  006510' 001420                        BEQ     5$
 1309  006512' 104403  000000' 012414'        MSGNS,BEGIN,HCE ;ASCII MESSAGE CALL WITH COMMON HEADER
 1310  006520' 016767  172342  172510        MOV     S+14,STORE
 1311  006526' 042767  177177  172502        BIC     #177177,STORE           ;SAVE ONLY HCRC & HCE
```

```
1312  006534' 022767  000600  172474          CMP     #600,STORE
1313  006542' 001403                          BEQ     5$                      ;SOFT ERROR IF BOTH SET
1314  006544' 052767  177777  172466          BIS     #-1,HRDERR              ;SET HRD ERR .
1315  006552' 032767  077157  172306  5$:     BIT     #77157,S+14             ;ONLY HARD'S LEFT
1316  006560' 001001                          BNE     6$
1317  006562' 000207                          RTS     PC
1318
1319  006564' 052767  177777  172446  6$:     BIS     #-1,HRDERR              ;SET HRD ERR .
1320  006572' 032767  040000  172266          BIT     #BIT14,S+14             ;UNS ?
1321  006600' 001403                          BEQ     7$
1322  006602' 104403  000000' 012420'        MSGN$,BEGIN,UNSER       ;ASCII MESSAGE CALL WITH COMMON HEADER
1323  006610' 032767  020000  172250  7$:     BIT     #BIT13,S+14             ;OPI ?
1324  006616' 001403                          BEQ     8$
1325  006620' 104403  000000' 012424'        MSGN$,BEGIN,OPIER       ;ASCII MESSAGE CALL WITH COMMON HEADER
1326  006626' 032767  010000  172232  8$:     BIT     #BIT12,S+14             ;DTE ?
1327  006634' 001403                          BEQ     9$
1328  006636' 104403  000000' 012430'        MSGN$,BEGIN,DTER        ;ASCII MESSAGE CALL WITH COMMON HEADER
1329  006644' 032767  004000  172214  9$:     BIT     #BIT11,S+14             ;WLE ?
1330  006652' 001403                          BEQ     10$
1331  006654' 104403  000000' 012434'        MSGN$,BEGIN,WLER        ;ASCII MESSAGE CALL WITH COMMON HEADER
1332  006662' 032767  002000  172176  10$:    BIT     #BIT10,S+14             ;IAE ?
1333  006670' 001403                          BEQ     20$
1334  006672' 104403  000000' 012440'        MSGN$,BEGIN,IAER        ;ASCII MESSAGE CALL WITH COMMON HEADER
1335  006700' 032767  001000  172160  20$:    BIT     #BIT9,S+14              ;                       >
1336  006706' 001403                          BEQ     17$                     ;                       >
1337  006710' 104403  000000' 012474'        MSGN$,BEGIN,AUE ;ASCII MESSAGE CALL WITH COMMON HEADER
1338  006716' 032767  000040  172142  17$:    BIT     #BIT5,S+14              ;
1339  006724' 001403                          BEQ     11$                     ;
1340  006726' 104403  000000' 012500'        MSGN$,BEGIN,WCF ;ASCII MESSAGE CALL WITH COMMON HEADER
1341  006734' 032767  000100  172124  11$:    BIT     #BIT6,S+14              ;ECH ?
1342  006742' 001405                          BEQ     12$
1343  006744' 104403  000000' 012444'        MSGN$,BEGIN,ECHR        ;ASCII MESSAGE CALL WITH COMMON HEADER
1344  006752' 004767  000202                  JSR     PC,BAD
1345  006756' 032767  000010  172102  12$:    BIT     #BIT3,S+14              ;PAR  ?
1346  006764' 001403                          BEQ     13$
1347  006766' 104403  000000' 012450'        MSGN$,BEGIN,PAER        ;ASCII MESSAGE CALL WITH COMMON HEADER
1348  006774' 032767  000004  172064  13$:    BIT     #BIT2,S+14              ;RMR ?
1349  007002' 001403                          BEQ     14$
1350  007004' 104403  000000' 012454'        MSGN$,BEGIN,RMRR        ;ASCII MESSAGE CALL WITH COMMON HEADER
1351  007012' 032767  000002  172046  14$:    BIT     #BIT1,S+14              ;ILR ?
1352  007020' 001403                          BEQ     15$
1353  007022' 104403  000000' 012460'        MSGN$,BEGIN,ILRR        ;ASCII MESSAGE CALL WITH COMMON HEADER
1354  007030' 032767  000001  172030  15$:    BIT     #BIT0,S+14              ;ILF ?
1355  007036' 001403                          BEQ     16$
1356  007040' 104403  000000' 012464'        MSGN$,BEGIN,ILFR        ;ASCII MESSAGE CALL WITH COMMON HEADER
1357  007046' 000207                  16$:    RTS     PC
1358
1359                                          ;       R E V  D   END OF UPDATE
1360
1361
1362                                          ;////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\
1363                                          ;////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\
1364
1365
1366
1367  007050'                         ERRORS:                                                         ;DRB001
```



```
1368  007050' 005777  173244                  TST     @#HCS1          ;IF NO ERROR THEN                       ;DRB001
1369  007054' 100402                          BMI     1$              ;BEGIN                                  ;DRB001
1370  007056' 000241                          CLC                     ; SET NO ERROR                          ;DRB001
1371  007060' 000207                          RTS     PC
1372
1373                                                                  ;ELSE                                   ;DRB001
1374  007062' 032767  000006  172052  1$:     BIT     #6,TYPFLG       ; IF DRIVE TYPE IS RM02/3/ OR RM05       ;RMDB5
1375  007070' 001413                          BEQ     4$              ; (BR IF NOT RM)                        ;RMDB
1376  007072' 032777  100000  173262          BIT     #100000,@RPER3  ; AND IF BIT 15 (MSE) SET IN RMER2       ;RMDB1
1377                                                                  ; (NOTE: RPER3 = RMER2 SEE DOCUMENTATION) ;RMDB1
1378  007100' 001407                          BEQ     4$              ; (BR IF NOT MSE)                       ;RMDB
1379  007102' 000241                          CLC                     ; THEN DON'T COUNT THIS AS AN ERROR      ;RMDB
1380  007104' 004767  000050                  JSR     PC,BAD          ; THIS IS A BAD SECTOR SO ENTER II       ;RMDB1
1381  007110' 062706  000004                  ADD     #4,R6           ; ADJUST SP FOR RETURN TO LOOP2          ;RMDB1
1382  007114' 000167  173504                  JMP     LOOP2           ; GO DO NEXT COMPLETE CYCLE              ;RMDB1
1383
1384
1385  007120' 000261                  4$:     SEC                     ;SET C BIT TO INDICATE ERROR            ;RMDB
1386  007122' 005000                          CLR     R0              ;INIT INDEX
1387  007124' 016701  173170                  MOV     @#HCS1,R1       ; BEGIN OF REGISTER POINTERS            ;DRB001
1388  007130'                         3$:                             ; REPEAT                                ;DRB001
1389                                                                  ; BEGIN                                 ;DRB001
1390  007130' 012160  001052'                 MOV     (R1)+,S(R0)     ;  MOV REGISTER TO TEMPORARY            ;DRB001
1391  007134' 005720                          TST     (R0)+           ;  ADVANCE POINTER                      ;DRB001
1392  007136' 022760  177777  002242'         CMP     #-1,TABLE(R0)   ;END ?    REV D                         ;WRRMRP
1393  007144' 001401                          BEQ     33$             ;YES END OF TABLE                       ;DJM01
1394  007146' 000770                          BR      3$              ;  NO GO DO IT AGAIN                    ;DJM01
1395  007150' 004767  000476          33$:    JSR     PC,ERSUB1       ; GET SOME TRIVIAL INFO                 ;DRB001
1396
1397
1398
1399  007154' 000167  176332                  JMP     EROR            ;               REV. DO  ;RCF
1400
1401  007160'                         BAD:
1402  007160'                         11$:                            ;  BEGIN                                ;DRB001
1403  007160' 116767  172002  172004          MOVB    SECTOR,BADSEC   ;   SET CURRENT SECTOR                  MK002
1404  007166' 116767  171775  172000          MOVB    TRACK,BADTRK    ;   SET CURRENT TRACK                   ;MK002
1405  007174' 016767  171762  171760          MOV     CYLNDR,BADCYL   ;   SET CURRENT CYLINDER                ;MK002
1406  007202' 032767  000100  170606          BIT     #BDSPI,SR1      ;IF OPERATOR WANTS TYPEOUT      ;MK002
1407  007210' 001423                          BEQ     12$             ;ELSE BRANCH AROUND MSG ;MK002
1408                                          ;*****************************************************************
1409                                                                  ;CONVERT UNITNO TO ASCII AND
1410                                                                  ;STORE AT ADR1
1411  007212' 104420  000000' 001216'         OTOA$,BEGIN,UNITNO,ADR1
1412  007220' 012516'
1413                                          ;*****************************************************************
1414                                          ;*****************************************************************
1415
1416                                                                  ;CONVERT BADCYL TO ASCII AND
1417  007222' 104420  000000' 001170'         OTOA$,BEGIN,BADCYL,CYLNO        ;STORE AT CYLNO
1418  007230' 010562'
1419                                          ;*****************************************************************
1420                                          ;*****************************************************************
1421
1422                                                                  ;CONVERT BADTRK TO ASCII AND
1423  007232' 104420  000000' 001174'         OTOA$,BEGIN,BADTRK,TRKNO        ;STORE AT TRKNO
```

```
 1424  007240' 010600'
 1425                                   ;*************************************************************
 1426                                   ;*************************************************************
 1427
 1428                                                           ;CONVERT BADSEC TO ASCII AND
 1429  007242' 104420  000000' 001172'         OTOAS,BEGIN,BADSEC,SECNO  ;STORE AT SECNO
 1430  007250' 010616'
 1431                                   ;*************************************************************
 1432  007252' 104403  000000' 012232'         MSGNS,BEGIN,BADMES        ;ASCII MESSAGE CALL WITH COMMON HEADER
 1433  007260'                          12$:                             ;  END                          ;DRB001
 1434  007260' 026727  171652  001052'         CMP     NXTBBK,#ENDBBK    ;  IF MORE SPACE IN TABLE THEN  ;DRB001
 1435  007266' 002012                          BGE     13$               ;  BEGIN                        ;DRB001
 1436  007270' 016700  171642                  MOV     NXTBBK,R0         ;   R0 POINTS TO NEXT FREE SLOT IN TABLE;DRB001
 1437  007274' 016720  171670                  MOV     BADCYL,(R0)+      ;   STUFF CYLINDER NUMBER       ;DRB001
 1438  007300' 116720  171666                  MOVB    BADSEC,(R0)+      ;   STUFF REST OF DISK ADDRESS  ;MK002
 1439  007304' 116720  171664                  MOVB    BADTRK,(R0)+      ;                               ;MK002
 1440  007310' 010067  171622                  MOV     R0,NXTBBK         ;   UPDATE POINTER              ;DRB001
 1441  007314'                          13$:                             ;  END                          ;DRB001
 1442  007314' 000207                          RTS     PC
 1443
 1444
 1445
 1446
 1447
 1448  007316' 012767  077777  171706  NOTRDY: MOV     #77777,CLK        ; SET THE TIMER
 1449  007324'                          4$:
 1450  007324' 032777  004000  172766          BIT     #BIT11,@RHCS1     ;DO I HAVE THE DRIVE DVA?
 1451  007332' 001406                          BEQ     6$                ;NO
 1452  007334' 010046                          MOV     R0,-(SP)
 1453  007336' 012600                          MOV     (SP)+,R0          ;JUST WASTE A LITTLE TIME
 1454  007340' 032777  004000  172752          BIT     #BIT11,@PHCS1             ;STILL GOT IT?
 1455  007346' 001017                          BNE     2$
 1456  007350'                          6$:
 1457  007350' 104407  000000'                BREAKS,BEGIN              ;TEMPORARY RETURN TO MONITOR....
 1458  007354' 104407  000000'                BREAKS,BEGIN              ;THEN CONTINUE AT NEXT INSTRUCTION.
 1459  007360' 104407  000000'                BREAKS,BEGIN              ;TEMPORARY RETURN TO MONITOR....
 1460  007364' 104407  000000'                BREAKS,BEGIN              ;THEN CONTINUE AT NEXT INSTRUCTION.
 1461  007370' 005367  171636                  DEC     CLK               ;COUNT # OF TRIES
 1462  007374' 001353                          BNE     4$                ;NOT DONE YET
 1463  007376' 104403  000000' 012256'         MSGNS,BEGIN,NOT ;ASCII MESSAGE CALL WITH COMMON HEADER
 1464  007404' 000427                          BR      7$                ;COULD NOT GET DRIVE
 1465  007406' 004567  173626          2$:     JSR     R5,CLEAR          ;SET THE CONTROLLER AND DRIVE
 1466  007412' 004567  000076                  JSR     R5,READY          ; IS DRIVE READY ?
 1467  007416' 000435                          BR      1$                ; YES, CONTINUE
 1468  007420' 004767  000226          5$:     JSR     PC,ERSUB1         ; LOAD ERROR INFORMATION
 1469  007424' 005000                          CLR     R0                ;MOVE DRIVE REG INTO TABLE
 1470  007426' 016701  172666                  MOV     RHCS1,R1
 1471  007432' 012160  001052'          22$:    MOV     (R1)+,S(R0)
 1472  007436' 005720                          TST     (R0)+
 1473  007440' 022760  177777  002242'         CMP     #177777,TABLE(R0)                                 ;WMRMRP
 1474  007446' 001371                          BNE     22$
 1475  007450' 012767  000006  170430          MOV     #6,ERRTYP         ;DRIVE NOT READY
 1476                                   ;*************************************************************
 1477  007456' 104405  000000' 002242'         ERRORS,BEGIN,TABLE        ; DRIVE  NOT READY
 1478                                   ;*************************************************************
 1479                                                                     ;**-1                        ;DRB001
```



```
 1480  007464' 004767  173522          7$:     JSR     PC,RELESE         ;RELEASE THE DRIVE              ;DRB001
 1481  007470' 004767  175760                  JSR     PC,DROP           ; NO, DROP THE DRIVE
 1482  007474' 104403  000000' 012274'         MSGNS,BEGIN,DRP ;ASCII MESSAGE CALL WITH COMMON HEADER
 1483  007502' 016706  170324                  MOV     SPDINT,R6
 1484  007506' 000167  173112                  JMP     LOOP2
 1485  007512' 000207                  1$:     RTS     PC                ;RETURN
 1486                                   ;       ------------------------
 1487
 1488
 1489  007514' 016777  171476  172606  READY:  MOV     UNITNO,@RHCS2     ; LOAD UNIT ADDRESS
 1490  007522' 017700  172572                  MOV     @RHCS1,R0
 1491  007526' 032700  004000                  BIT     #BIT11,R0
 1492  007532' 001433                          BEQ     1$
 1493  007534' 017700  172572                  MOV     @RHDS,R0          ; SAVE STATUS IN R0
 1494  007540' 105700                          TSTB    R0                ; DRIVE READY ?
 1495  007542' 100027                          BPL     1$                ; NO
 1496  007544' 032700  000100                  BIT     #BIT6,R0          ; VOLUME VALID ?
 1497  007550' 001424                          BEQ     1$                ; NO
 1498  007552' 032700  000400                  BIT     #BIT8,R0          ; DRIVE PRESENT ?
 1499  007556' 001421                          BEQ     1$                ; NO
 1500  007560' 032700  004000                  BIT     #BIT11,R0         ; WRITE LOCKED ?
 1501  007564' 001016                          BNE     1$                ; YES
 1502  007566' 032700  010000                  BIT     #BIT12,R0         ; MEDIUM ON LINE ?
 1503  007572' 001413                          BEQ     1$                ; NO
 1504  007574' 032700  040000                  BIT     #BIT14,R0         ; ANY ERRORS ?
 1505  007600' 001010                          BNE     1$                ; YES
 1506  007602' 005700                          TST     R0                ; ATTENTION SET ?
 1507  007604' 100406                          BMI     1$                ; YES
 1508  007606' 032777  004000  172504          BIT     #BIT11,@RHCS1     ;DVA SET?
 1509  007614' 001402                          BEQ     1$                ;BR IF NOT
 1510                                                                     ;**-3                        ;DRB001
 1511  007616' 000261                          SEC                       ; READY                      ;DRB001
 1512  007620' 000401                          BR      2$                ; RETURN                     ;DRB001
 1513  007622' 000241                  1$:     CLC                       ; NOT READY                  ;DRB001
 1514  007624' 000205                  2$:     RTS     R5                ;RETURN                      ;DRB001
 1515                                   ;       ------------------------
 1516
 1517
 1518  007626' 014167  170254          ERSUB2: MOV     -(R1),ASB         ; LOAD THE DATA
 1519  007632' 010167  170244                  MOV     R1,SHADR          ; LOAD ADDRESS OF DATA WRITTEN
 1520  007636' 014267  170246                  MOV     -(R2),AWAS        ; LOAD THE DATA
 1521  007642' 010267  170236                  MOV     R2,WASADR         ; LOAD ADDRESS OF DATA READ
 1522  007646' 005721                          TST     (R1)+             ; RESET REG. 1
 1523  007650' 005722                          TST     (R2)+             ; RESET REG. 2
 1524
 1525  007652' 016767  172442  170220  ERSUB1: MOV     RHCS1,CSRA        ; LOAD ADR OF CURRENT CSR
 1526  007660' 017767  172434  170214          MOV     @RHCS1,ACSR       ; LOAD CONTENTS OF CURRENT CSR
 1527  007666' 000207                          RTS     PC                ; RETURN
 1528
 1529
 1530  007670'                  REZET:
 1531  007670' 012777  000040  172432  3$:     MOV     #BIT5,@RHCS2      ; ISSUE AN RH11 INIT
 1532  007676' 012767  077777  171326          MOV     #77777,CLK        ; SET THE TIMER
 1533  007704' 105777  172410          1$:     TSTB    @RHCS1            ; CONTROLLER READY ?
 1534  007710' 100417                          BMI     2$                ; YES, CONTINUE
 1535  007712' 104407  000000'                BREAKS,BEGIN              ;TEMPORARY RETURN TO MONITOR....
```

```
1536  007716' 104407  000000'                 BREAKS,BEGIN            ;THEN CONTINUE AT NEXT INSTRUCTION.
1537  007722' 005367  171304                 DEC     CLK             ; WAIT SOME MORE ?
1538  007726' 001366                         BNE     1$              ; YES
1539  007730' 012767  000003  170150         MOV     #3,ERRTYP       ;CONTROLLER NOT READY
1540                                          ;*****************************************************************
1541  007736' 104405  000000' 000000         ERDER$,BEGIN,NULL       ; CONTROLLER NOT READY
1542                                          ;*****************************************************************
1543  007744' 104410  000000'                 ENDS,BEGIN              ;
1544  007750' 017746  172362         2$:     MOV     @#PAS,-(SP)
1545  007754' 012677  172356                 MOV     (SP)+,@#PAS
1546  007760' 000207                         RTS     PC              ; RETURN
1547                                  ;       -------------------------
1548
1549
1550  007762' 016700  170020         SETUP:  MOV     ADDR,R0         ; GET DEVICE ADDRESS
1551  007766' 010067  172326                 MOV     R0,RHCS1        ; GENERATE REGISTER ADDRESSES
1552  007772' 062700  000002                 ADD     #2,R0
1553  007776' 010067  172320                 MOV     R0,RHWC
1554  010002' 062700  000002                 ADD     #2,R0
1555  010006' 010067  172312                 MOV     R0,RHBA
1556  010012' 062700  000002                 ADD     #2,R0
1557  010016' 010067  172304                 MOV     R0,RPDA
1558  010022' 062700  000002                 ADD     #2,R0
1559  010026' 010067  172276                 MOV     R0,RHCS2
1560  010032' 062700  000002                 ADD     #2,R0
1561  010036' 010067  172270                 MOV     R0,RPDS
1562  010042' 062700  000002                 ADD     #2,R0
1563  010046' 010067  172262                 MOV     R0,RPER1
1564  010052' 062700  000002                 ADD     #2,R0
1565  010056' 010067  172254                 MOV     R0,RPAS
1566  010062' 062700  000002                 ADD     #2,R0
1567  010066' 010067  172246                 MOV     R0,RPLA
1568  010072' 062700  000002                 ADD     #2,R0
1569  010076' 010067  172240                 MOV     R0,RHDR
1570  010102' 062700  000002                 ADD     #2,R0
1571  010106' 010067  172232                 MOV     R0,RPMR
1572  010112' 062700  000002                 ADD     #2,R0
1573  010116' 010067  172224                 MOV     R0,RPDT
1574  010122' 062700  000002                 ADD     #2,R0
1575  010126' 010067  172216                 MOV     R0,RPSN
1576  010132' 062700  000002                 ADD     #2,R0
1577  010136' 010067  172210                 MOV     R0,RPOF
1578  010142' 062700  000002                 ADD     #2,R0
1579  010146' 010067  172202                 MOV     R0,RPDC
1580  010152' 062700  000002                 ADD     #2,R0
1581  010156' 010067  172174                 MOV     R0,RPCC
1582  010162' 062700  000002                 ADD     #2,R0
1583  010166' 010067  172166                 MOV     R0,RPER2
1584  010172' 062700  000002                 ADD     #2,R0
1585  010176' 010067  172160                 MOV     R0,RPER3
1586  010202' 062700  000002                 ADD     #2,R0
1587  010206' 010067  172152                 MOV     R0,RPEC1
1588  010212' 062700  000002                 ADD     #2,R0
1589  010216' 010067  172144                 MOV     R0,RPEC2
1590                                                                          ;**-7           ;DRB001
1591  010222' 032767  001000  167626         BIT     #ADDR22,RES1    ;DO WE HAVE 22-BIT ADDR SUPPORT?  ;DRB001
```



```
1592  010230' 001415                         BEQ     1$              ;NO                             ;DRB001
1593  010232' 032767  000200  167556         BIT     #RH70,SR1       ;IS THIS AN RH70                ;DRB001
1594  010240' 001411                         BEQ     1$              ;NO                             ;DRB001
1595  010242' 062700  000002                 ADD     #2,R0
1596  010246' 010067  172116                 MOV     R0,RHBAE
1597  010252' 062700  000002                 ADD     #2,R0
1598  010256' 010067  172110                 MOV     R0,RHCS3
1599
1600  010262' 000403                         BR      2$                                              ;DRB001
1601  010264' 042767  001000  167564  1$:    BIC     #ADDR22,RES1    ; CAN'T USE 22 BIT ADDRESSING    ;DRB001
1602  010272' 016700  167512          2$:    MOV     VECTOR,R0       ; GET VECTOR ADDRESS
1603  010276' 012720  003452'                 MOV     #NTRUPT,(R0)+   ; SET POINTER JUST IN CASE
1604  010302' 116710  167504                 MOVB    BR1,(R0)        ; SET PRIORITY
1605  010306' 000207                         RTS     PC              ; RETURN
1606
```

```
                                        .SBTTL  MODULE MESSAGES                                         ;DRB001
                                                                                ;**-40                  ;DRB001
010310' 042440  051122  051117  MES1:   .ASCIZ  ' ERROR%'                                               ;DRB001
010316' 000045
010320' 050040  051101  052111  MES2:   .ASCIZ  ' PARITY'                                              ;DRB001
010326' 000131
010330' 042040  044522  042526  MES3:   .ASCIZ  ' DRIVE '                                               ;DRB001
010336' 000040
010340' 046440  051501  041123  MES4:   .ASCIZ  ' MASSBUS'                                            ;DRB001
010346' 051525     000
010351'     040  040504  040524  MES5:   .ASCIZ  ' DATA'                                              ;DRB001
010356'     000
010357'     040  042522  051124  MES6:   .ASCIZ  ' RETRY EXCEEDED%'                                    ;DRB001
010364' 020131  054105  042503
010372' 042105  042105  000045
010400' 046040  052101  000105  MES7:   .ASCIZ  ' LATE'                                              ;DRB001
010406' 047516  020124  042522  MES8:   .ASCIZ  'NOT READY%'                                         ;DRB001
010414' 042101  022531     000
010421'     040  047503  046125  MES9:   .ASCIZ  ' COULD NOT GET'                                     ;DRB001
010426' 020104  047516  020124
010434' 042507  000124
010440' 042040  047522  050120  MES10:  .ASCIZ  ' DROPPED'                                           ;DRB001
010446' 042105     000
010451'     072  047040  052117  MES11:  .ASCIZ  ': NOT AN RP04/5/6 OR AN RM02/3/5%'                  ;DRB001;WMRMRP
010456' 040440  020116  050122
010464' 032060  032457  033057
010472' 047440  020122  047101
010500' 051040  030115  027462
010506' 027463  022465     000
010513'     040  051124  047101  MES12:  .ASCIZ  ' TRANSFER'                                          ;DRB001
010520' 043123  051105     000
010525'     045     000         MES13:  .ASCIZ  '%'                                                 ;DRB001
010527'     072  041040  042101  MES15:  .ASCIZ  ': BADSPOT AT (OCTAL) CYL: '                         ;DRB001
010534' 050123  052117  040440
010542' 020124  047450  052103
010550' 046101  020051  054503
010556' 035114  000040
010562' 000002              CYLNO:  .BLKB   2                                                       ;DRB001
010564' 020040  020040  020054  MES16:  .ASCIZ  '    , TRK: '                                       ;DRB001
010572' 051124  035113  000040
010600' 000004              TRKNO:  .BLKB   4                                                       ;DRB001
010604' 020040  020054  042523  MES17:  .ASCIZ  '  , SEC: '                                         ;DRB001
010612' 035103  000040
010616' 000004              SECNO:  .BLKB   4                                                       ;DRB001
010622' 020040  000045      MES18:  .ASCIZ  '  %'                                                  ;DRB001
010626' 052440  045516  047516  MES19:  .ASCIZ  ' UNKNOWN'                                         ;DRB001
010634' 047127     000


                                        ;////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\
                                        ;////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\////\\\\


                                        ;REV D  UPDATES         ;MCP
```



```
010637'     110  051101  020104  MES20:  .ASCIZ  'HARD ERROR(S) SET IN RPER2  %'
010644' 051105  047522  024122
010652' 024523  051440  052105
010660' 044440  020116  050122
010666' 051105  020062  022440
010674'     000
010675'     110  051101  020104  MES21:  .ASCIZ  'HARD ERROR(S) SET IN RPER3  % '
010702' 051105  047522  024122
010710' 024523  051440  052105
010716' 044440  020116  050122
010724' 051105  020063  022440
010732' 000040
010734' 051127  052111  020105  MES22:  .ASCIZ  'WRITE CHECK ERROR  % '
010742' 044103  041505  020113
010750' 051105  047522  020122
010756' 022440  000040
010762' 041523  051440  052105  MES23:  .ASCIZ  'SC SET  %'
010770' 020040  000045
010774' 044124  020105  047506  MES24:  .ASCIZ  'THE FOLLOWING ERROR BITS ARE SET IN RPCS2 % % '
011002' 046114  053517  047111
011010' 020107  051105  047522
011016' 020122  044502  051524
011024' 040440  042522  051440
011032' 052105  044440  020116
011040' 050122  051503  020062
011046' 020045  020045     000
011053'     125  044516  052502  MES25:  .ASCIZ  'UNIBUS PARITY ERROR % '
011060' 020123  040520  044522
011066' 054524  042440  051122
011074' 051117  022440  000040
011102' 047516  020116  054105  MES26:  .ASCIZ  'NON EXISTANT DRIVE % '
011110' 051511  040524  052116
011116' 042040  044522  042526
011124' 022440  000040
011130' 054116  020115  022440  MES27:  .ASCIZ  'NXM  %'
011136'     000
011137'     120  047522  051107  MES28:  .ASCIZ  'PROGRAM ERROR  PGE  % '
011144' 046501  042440  051122
011152' 051117  020040  043520
011160' 020105  022440  000040
011166' 044515  051523  042105  MES29:  .ASCIZ  'MISSED TRANSFER  %  '
011174' 052040  040522  051516
011202' 042506  020122  022440
011210' 020040     000
011213'     115  051501  041123  MES30:  .ASCIZ  'MASSBUS DATA LINE PARITY ERROR  % '
011220' 051525  042040  052101
011226' 020101  044514  042516
011234' 050040  051101  052111
011242' 020131  051105  047522
011250' 020122  022440  000040
011256' 044124  020105  047506  MES31:  .ASCIZ  'THE FOLLOWING BITS ARE SET IN RPER1  % % '
011264' 046114  053517  047111
011272' 020107  044502  051524
011300' 040440  042522  051440
011306' 052105  044440  020116
011314' 050122  051105  020061
```

```
 1719  011322' 022440  022440  000040
 1720  011330' 040504  040524  041440  MES32:  .ASCIZ  'DATA CHECK ERROR  % '
 1721  011336' 042510  045503  042440
 1722  011344' 051122  051117  020040
 1723  011352' 020045     000
 1724  011355'    106  051117  040515  MES33:  .ASCIZ  'FORMAT ERROR  %  '
 1725  011362' 020124  051105  047522
 1726  011370' 020122  022440  020040
 1727  011376'    000
 1728  011377'    040  042510  042101  MES34:  .ASCIZ  ' HEADER CRC ERROR % '
 1729  011404' 051105  041440  041522
 1730  011412' 042440  051122  051117
 1731  011420' 022440  000040
 1732  011424' 042510  042101  051105  MES35:  .ASCIZ  'HEADER COMPARE ERROR  % '
 1733  011432' 041440  046517  040520
 1734  011440' 042522  042440  051122
 1735  011446' 051117  020040  020045
 1736  011454'    000
 1737  011455'    104  044522  042526  MES36:  .ASCIZ  'DRIVE UNSAFE  % '
 1738  011462' 052440  051516  043101
 1739  011470' 020105  022440  000040
 1740  011476' 050117  051105  052101  MES37:  .ASCIZ  'OPERATION INCOMPLETE % '
 1741  011504' 047511  020116  047111
 1742  011512' 047503  050115  042514
 1743  011520' 042524  022440  000040
 1744  011526' 051104  053111  020105  MES38:  .ASCIZ  'DRIVE TIMING ERROR % '
 1745  011534' 044524  044515  043516
 1746  011542' 042440  051122  051117
 1747  011550' 022440  000040
 1748  011554' 051127  052111  020105  MES39:  .ASCIZ  'WRITE LOCK ERROR % '
 1749  011562' 047514  045503  042440
 1750  011570' 051122  051117  022440
 1751  011576' 000040
 1752  011600' 047111  040526  044514  MES40:  .ASCIZ  'INVALID ADDRESS ERROR % '
 1753  011606' 020104  042101  051104
 1754  011614' 051505  020123  051105
 1755  011622' 047522  020122  020045
 1756  011630'    000
 1757  011631'    105  041503  044040  MES41:  .ASCIZ  'ECC HARD ERROR % '
 1758  011636' 051101  020104  051105
 1759  011644' 047522  020122  020045
 1760  011652'    000
 1761  011653'    120  051101  052111  MES42:  .ASCIZ  'PARITY ERROR % '
 1762  011660' 020131  051105  047522
 1763  011666' 020122  020045     000
 1764  011673'    122  043505  051511  MES43:  .ASCIZ  'REGISTER MODIFICATION REFUSED  % '
 1765  011700' 042524  020122  047515
 1766  011706' 044504  044506  040503
 1767  011714' 044524  047117  051040
 1768  011722' 043105  051525  042105
 1769  011730' 020040  020045     000
 1770  011735'    111  046114  043505  MES44:  .ASCIZ  'ILLEGAL REGISTER % '
 1771  011742' 046101  051040  043505
 1772  011750' 051511  042524  020122
 1773  011756' 020045     000
 1774  011761'    111  046114  043505  MES45:  .ASCIZ  'ILLEGAL FUNCTION % '
```



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 1775  011766' 046101  043040  047125
 1776  011774' 052103  047511  020116
 1777  012002' 020045     000
 1778  012005'    040  022445  020045  MES46:  .ASCIZ  ' %%%   ********************************** %% '
 1779  012012' 020040  025052  025052
 1780  012020' 025052  025052  025052
 1781  012026' 025052  025052  025052
 1782  012034' 025052  025052  025052
 1783  012042' 025052  025052  025052
 1784  012050' 025052  025052  025052
 1785  012056' 025052  022440  020045
 1786  012064'    000
 1787  012065'    101  042104  042522  MES47:  .ASCIZ  'ADDRESS OVERFLOW ERROR % '
 1788  012072' 051523  047440  042526
 1789  012100' 043122  047514  020127
 1790  012106' 051105  047522  020122
 1791  012114' 020045     000
 1792  012117'    127  044522  042524  MES48:  .ASCIZ  'WRITE LOCK FAILURE % '
 1793  012124' 046040  041517  020113
 1794  012132' 040506  046111  051125
 1795  012140' 020105  020045     000
 1796  012145'    040  020055  047514  MES49:  .ASCIZ  ' - LOAD MEDIA % '  ;RMDB1
 1797  012152' 042101  046440  042105
 1798  012160' 040511  022440  000040
 1799
 1800
 1801                                        ; R E V  D   END OF  UPDATE
 1802
 1803                                        ;/////\\\\\/////\\\\\/////\\\\\/////\\\\\/////\\\\\
 1804                                        ;/////\\\\\/////\\\\\/////\\\\\/////\\\\\/////\\\\\
 1805
 1806
 1807                                .EVEN                                                   ;DRB001
 1808                                                                                        ;DRB001
 1809  012166' 010513'               TRERR:  MES12                                           ;DRB001
 1810  012170' 010310'                       MES1                                            ;DRB001
 1811  012172' 177777                       177777                                          ;DRB001
 1812                                                                                        ;DRB001
 1813  012174' 010340'               MCPERR: MES4                                            ;DRB001
 1814  012176' 010320'                       MES2                                            ;DRB001
 1815  012200' 010310'                       MES1                                            ;DRB001
 1816  012202' 177777                       177777                                          ;DRB001
 1817                                                                                        ;DRB001
 1818  012204' 010340'               MDPERR: MES4                                            ;DRB001
 1819  012206' 010351'                       MES5                                            ;DRB001
 1820  012210' 010320'                       MES2                                            ;DRB001
 1821  012212' 010310'                       MES1                                            ;DRB001
 1822  012214' 177777                       177777                                          ;DRB001
 1823                                                                                        ;DRB001
 1824  012216' 010357'               EXCED:  MES6                                            ;DRB001
 1825  012220' 177777                       177777                                          ;DRB001
 1826                                                                                        ;DRB001
 1827  012222' 010351'               DLTERR: MES5                                            ;DRB001
 1828  012224' 010400'                       MES7                                            ;DRB001
 1829  012226' 010310'                       MES1                                            ;DRB001
 1830  012230' 177777                       177777                                          ;DRB001
```

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 1831
 1832  012232' 010330'                BADMES: MES3                                    ;DRB001
 1833  012234' 012523'                        NUMB                                    ;DRB001
 1834  012236' 010527'                        MES15                                   ;DRB001
 1835  012240' 010564'                        MES16                                   ;DRB001
 1836  012242' 010604'                        MES17                                   ;DRB001
 1837  012244' 010622'                        MES18                                   ;DRB001
 1838  012246' 177777                         177777                                  ;DRB001
 1839                                                                                  ;DRB001
 1840  012250' 010626'                UNKNWN: MES19                                   ;DRB001
 1841  012252' 010310'                        MES1                                    ;DRB001
 1842  012254' 177777                         177777                                  ;DRB001
 1843                                                                                  ;DRB001
 1844  012256' 010330'                NOT:    MES3                                    ;DRB001
 1845  012260' 010406'                        MES8                                    ;DRB001
 1846  012262' 177777                         177777                                  ;DRB001
 1847                                                                                  ;DRB001
 1848  012264' 010421'                TOUT:   MES9                                    ;DRB001
 1849  012266' 010330'                        MES3                                    ;DRB001
 1850  012270' 010525'                        MES13                                   ;DRB001
 1851  012272' 177777                         177777                                  ;DRB001
 1852                                                                                  ;DRB001
 1853  012274' 010330'                DRP:    MES3                                    ;DRB001
 1854  012276' 012523'                        NUMB                                    ;DRB001
 1855  012300' 010440'                        MES10                                   ;DRB001
 1856  012302' 010525'                        MES13                                   ;DRB001
 1857  012304' 177777                         177777                                  ;DRB001
 1858                                                                                  ;DRB001
 1859  012306' 010330'                BADTYP: MES3                                    ;DRB001
 1860  012310' 012523'                        NUMB                                    ;DRB001
 1861  012312' 010440'                        MES10                                   ;DRB001
 1862  012314' 010451'                        MES11                                   ;DRB001
 1863  012316' 177777                         177777                                  ;DRB001
 1864
 1865
 1866                                         ;/////\\\\\/////\\\\\/////\\\\\/////\\\\\
 1867                                         ;/////\\\\\/////\\\\\/////\\\\\/////\\\\\
 1868
 1869                                         ;R E V  D  UPDATES
 1870
 1871  012320' 010637'                ER2ERR: MES20
 1872  012322' 177777                         177777
 1873
 1874  012324' 010675'                ER3ERR: MES21
 1875  012326' 177777                         177777
 1876
 1877  012330' 010734'                WCEERR: MES22
 1878  012332' 177777                         177777
 1879
 1880  012334' 010762'                SCERR:  MES23
 1881  012336' 177777                         177777
 1882
 1883  012340' 010774'                CS2HD:  MES24
 1884  012342' 177777                         177777
 1885
 1886  012344' 011053'                UPER:   MES25
```



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 1887  012346' 177777                         177777
 1888
 1889  012350' 011102'                NEDER:  MES26
 1890  012352' 177777                         177777
 1891
 1892  012354' 011130'                NXM:    MES27
 1893  012356' 177777                         177777
 1894
 1895  012360' 011137'                PGERR:  MES28
 1896  012362' 177777                         177777
 1897
 1898  012364' 011166'                MXFER:  MES29
 1899  012366' 177777                         177777
 1900
 1901  012370' 011213'                MDPER:  MES30
 1902  012372' 177777                         177777
 1903
 1904  012374' 011256'                ER1HD:  MES31
 1905  012376' 177777                         177777
 1906
 1907  012400' 011330'                DCKER:  MES32
 1908  012402' 177777                         177777
 1909
 1910  012404' 011355'                FERER:  MES33
 1911  012406' 177777                         177777
 1912
 1913  012410' 011377'                HCRC:   MES34
 1914  012412' 177777                         177777
 1915
 1916  012414' 011424'                HCE:    MES35
 1917  012416' 177777                         177777
 1918
 1919  012420' 011455'                UNSER:  MES36
 1920  012422' 177777                         177777
 1921
 1922  012424' 011476'                UPIER:  MES37
 1923  012426' 177777                         177777
 1924
 1925  012430' 011526'                DTEF:   MES38
 1926  012432' 177777                         177777
 1927  012434' 011554'                WLER:   MES39
 1928  012436' 177777                         177777
 1929  012440' 011600'                IAER:   MES40
 1930  012442' 177777                         177777
 1931
 1932  012444' 011631'                ECHR:   MES41
 1933  012446' 177777                         177777
 1934
 1935  012450' 011653'                PARR:   MES42
 1936  012452' 177777                         177777
 1937
 1938  012454' 011673'                RMRR:   MES43
 1939  012456' 177777                         177777
 1940
 1941  012460' 011735'                ILRR:   MES44
 1942  012462' 177777                         177777
```

```
                                ILFR:   MES45
012464' 011761'                         177777
012466' 177777
                                ASTER:  MES46
012470' 012005'                         177777
012472' 177777

                                AOE:    MES47                   ;       REV. D0
012474' 012065'                         177777
012476' 177777

                                WCF:    MES48                   ;       REV. D0
012500' 012117'                         177777
012502' 177777

                                LODMED: MES3                    ; LOAD MEDIA    ;RMDB
012504' 010330'                         NUMB
012506' 012523'                         MES10
012510' 010440'                         MES49
012512' 012145'                         177777
012514' 177777


                                ;R E V  D  END UPDATE

                                ;////\\\\////\\\\////\\\\////\\\\////\\\\
                                ;////\\\\////\\\\////\\\\////\\\\////\\\\


012516' 000005                  ADR1:   .BLKB   5                                       ;DRB001
012523'    040      000         NUMB:   .ASCIZ  / /                                     ;DRB001
           012526'                         .EVEN                                       ;DRB001
                                                                                       ;DRB001
                                ;-----------------------------                         ;DRB001
                                                                                       ;DRB001
012526' 000024                  PATCH:
012526' 000000                          .WORD   0
012530' 000000                          .WORD   0
012532' 000000                          .WORD   0
012534' 000000                          .WORD   0
012536' 000000                          .WORD   0
012540' 000000                          .WORD   0
012542' 000000                          .WORD   0
012544' 000000                          .WORD   0
012546' 000000                          .WORD   0
012550' 000000                          .WORD   0
012552' 000000                          .WORD   0
012554' 000000                          .WORD   0
012556' 000000                          .WORD   0
012560' 000000                          .WORD   0
012562' 000000                          .WORD   0
012564' 000000                          .WORD   0
012566' 000000                          .WORD   0
012570' 000000                          .WORD   0
012572' 000000                          .WORD   0
012574' 000000                          .WORD   0
000001                          .END                                                   ;DRB001
```



```
ACSR    000102R          273#   1526*
ADDR    000006R          239#   1550
ADDR22= 001000           302#    767   1591    1601
ADR1    012516R         1165    1411   1969#
AOE     012474R         1337    1949#
APTPRE= 000200           302#
ASR     000106R          277#   1518*
ASTAT   000104R          275#
ASTER   012470R         1184    1257   1946#
AUTO  = 000010           302#
AWAS    000110R          278#   1520*
BAD     007160R          809    1344   1380    1401#
BADCYL  001170R          555#   1405*  1417    1437
BADMES  012232R         1432    1832#
BADSEC  001172R          556#   1403*  1429    1438
BADSPT  000252R          305#    528    633     939
BADTRK  001174R          557#   1404*  1423    1439
BADTYP  012306R         1115    1859#
BDSPT = 000100           506#   1406
BEGIN   000000R          236#    655    669     672     684     686     696     747     748     774     782     791     808
                         862    1115   1165    1184    1193    1197    1211    1216    1220    1224    1228    1232    1245
                        1250    1257   1265    1268    1271    1274    1277    1280    1284    1288    1292    1295    1306
                        1309    1322   1325    1328    1331    1334    1337    1340    1343    1347    1350    1353    1356
                        1411    1417   1423    1429    1432    1457    1458    1459    1460    1463    1477    1482    1535
                        1536    1541   1543
BITAB   003670R           785     828    840#
BIT0  = 000001           302#    915   1028    1034    1056    1064    1081    1091    1098    1108    1354
BIT1  = 000002           302#   1351
BIT10 = 002000           302#   1275   1332
BIT11 = 004000           302#   1272   1329    1450    1454    1491    1500    1508
BIT12 = 010000           302#    763   1269    1326    1502
BIT13 = 020000           302#   1194   1266    1323
BIT14 = 040000           302#    762   1201    1221    1225    1320    1504
BIT15 = 100000           302#   1186   1229    1289    1298
BIT2  = 000004           302#    503   1348
BIT3  = 000010           302#   1345
BIT4  = 000020           302#    504   1293    1298
BIT5  = 000040           302#    505   1338    1531
BIT6  = 000100           302#    506   1341    1496
BIT7  = 000200           302#    507   1307
BIT8  = 000400           302#   1282   1303    1498
BIT9  = 001000           302#   1276   1335
BPORT = 000020           504#    913
BREAK$= 104407           302#    747    748    1457    1458    1459    1460    1535    1536
BR1     000012R          241#   1604
BR2     000013R          242#
BTODS = 104421           302#
CAPRES= 000004           302#
CDATA$= 104412           302#    696
CDERCT  000144R          292#
CDMDCT  000146R          293#
CHKCS2  006204R         1200    1264#
CHKER1  006346R         1205    1287#
CKHNG$= 000001           302#
CLEAR   003240R          752#   1465
CLK     001232R          575#   1448*  1461*   1532*   1537*
```

```
CLKPRE= 000001          302#
CLKSPS= 104422          302#
CLRCOM  005444R        1150#   1152
CLRRB   005434R        1148#
CONFIG  000056R         261#
CSRA    000100R         271#   1525#
CS2HD   012340R        1265    1883#
CYCLE   002670R         679     690#
CYL     001164R         550#    657#   865#   892#   898    902#   906    909#   912    924#
CYLLIM  001140R         530#    898    907    917   1029#  1035#  1057#  1065#  1082#  1092#  1099#  1109#
CYLMSK  001154R         543#    864   1038#  1068#  1123#
CYLNDR  001162R         549#    722    732    742    912#   917#   919    921#   943    959   1405
CYLNO   010562R        1417    1644#
DATCKS= 104411          302#
DATERS= 104404          302#
DCRER   012400R        1292    1907#
DLATE = 000004          503#   1190
DLTCNT  001220R         570#   1188#
DLTERR  012222R        1193    1827#
DLTFLG  006202R        1183#   1189#  1223#  1227#  1231#  1239   1241   1261#  1291#  1301#  1305#
DRIVE   001214R         567#
DROP    005454R         653    1114   1155#  1481
DRP     012274R        1482    1853#
DSKADR  001166R         551#    658#   721    731    741    903#   925#
DTER    012430R        1328    1925#
DVICE   001212R         566#    638#   650    682    828   1161#
DVID1   000014R         243#    638
EA22    001134R         526#    776    777#   778#   779
ECCMEM= 000100          302#
ECHR    012444R        1343    1932#
ENDBBK  001052R         501#   1434
END1TS= 104413          302#    686
ENDS  = 104410          302#    684   1543
ERDR    005512R        1183#   1399
ERRORS  007050R         794    1367#
ERRTYP  000106R         276#   1475#  1539#
ERSUB1  007652R        1395    1468   1525#
ERSUB2  007626R        1518#
ER1HD   012374R        1288    1904#
ER2ERR  012320R        1211    1216   1871#
ER3ERR  012324R        1220    1874#
EXCED   012216R         808    1824#
EXITS = 104400          302#    782
FERADR  001230R         574#    716#   726#   736#   807
FERER   012404R        1295    1910#
FLAG    001210R         565#    915   1028#  1034#  1056#  1064#  1081#  1091#  1098#  1108#
FREE    000150R         294#
FUNC    001222R         571#    715#   725#   735#   780#   781
GETDVT  004552R         836    1016#
GETPAS= 104415          302#    669
GO      003324R         724     734    744    766#
GWBUFS= 104414          302#    672
HCE     012414R        1309    1916#
HCRC    012410R        1306    1913#
HRDCNT  000044R         256#
HRDCS2= 137400          508#   1198
```



```
HRDERR  001240R         578#    799   1185#  1192#  1196#  1210#  1215#  1219#  1237   1264#  1300#  1314#  1319#
HRDERS= 104405          302#   1250   1477   1541
HRDER1= 177777          509#   1203
HRDER2= 167777          510#   1213
HRDER3= 140153          511#   1217
HRDPAS  000050R         258#
IAER    012440R        1334    1929#
ICONT   000036R         253#
ICOUNT  000040R         254#
IDNUM   000122R         283#
ILER    012464R        1356    1944#
ILRR    012460R        1353    1941#
IMODX.= 000000          295#    673
INDPAR= 000040          302#
INIT    000030R         250#
INTR    000120R         282#    632#
KTPRES= 000400          302#
KTXINT= 040000          302#
LASCYL  001176R         559#    919    921   1011#  1030#  1036#  1058#  1066#  1083#  1093#  1100#  1110#
LASSEC  001202R         561#    930    932   1014#
LASTRK  001200R         560#    927    929   1013#
LODMED  012504R         655    1955#
LOOP1   002612R         671#    688
LOOP2   002624R         674#    680    814   1382   1481
MAP22S= 104416          302#    774
MCPERR  012174R        1197    1613#
MDPER   012370R        1284    1901#
MDPERP  012204R        1818#
MES1    010310R        1609#   1810   1815   1821   1829   1841
MES10   010440R        1628#   1855   1861   1957
MES11   010451R        1630#   1862
MES12   010513R        1636#   1809
MES13   010525R        1638#   1850   1856
MES15   010527R        1639#   1834
MES16   010564R        1645#   1835
MES17   010604R        1648#   1836
MES18   010622R        1651#   1837
MES19   010626R        1652#   1840
MES2    010320R        1611#   1814   1820
MES20   010637R        1663#   1871
MES21   010675R        1669#   1874
MES22   010734R        1675#   1877
MES23   010762R        1679#   1880
MES24   010774R        1681#   1883
MES25   011053R        1689#   1886
MES26   011102R        1693#   1889
MES27   011130R        1697#   1892
MES28   011137R        1699#   1895
MES29   011166R        1703#   1898
MES3    010330R        1613#   1832   1844   1849   1853   1859   1955
MES30   011213R        1707#   1901
MES31   011256R        1713#   1904
MES32   011330R        1720#   1907
MES33   011355R        1724#   1910
MES34   011377R        1728#   1913
MES35   011424R        1732#   1916
```

```
MES36   011455R          1737#   1919
MES37   011476R          1740#   1922
MES38   011526R          1744#   1925
MES39   011554R          1748#   1927
MES4    010340R          1615#   1813    1818
MES40   011600R          1752#   1929
MES41   011631R          1757#   1932
MES42   011653R          1761#   1935
MES43   011673R          1764#   1938
MES44   011735R          1770#   1941
MES45   011761R          1774#   1944
MES46   012005R          1778#   1946
MES47   012065R          1787#   1949
MES48   012117R          1792#   1952
MES49   012145R          1796#   1958
MES5    010351R          1617#   1819    1827
MES6    010357R          1619#   1824
MES7    010400R          1622#   1828
MES8    010406R          1623#   1845
MES9    010421R          1625#   1848
MODLUS  005422R           886     895     908    1137#
MODNAM  000000R           237#
MODSP   000252R           251     300#
MSGNS = 104403            302#    655     808    1115   1184   1193   1197   1411   1216   1220   1224   1228   1232
                         1257    1265    1268    1271   1274   1277   1280   1284   1288   1292   1295   1306   1309
                         1322    1325    1328    1331   1334   1337   1340   1343   1347   1350   1353   1356   1432
                         1463    1482
MSGSS = 104402            302#
MSGS  = 104401            302#
MXFER   012364R          1280    1898#
NCPUOP= 000020            302#
NEDER   012350R          1271    1889#
NUAPTY= 000002            302#
NORAND= 000040            505#    855     900    922
NOT     012256R          1463    1844#
NOTRDY  007316R           806     835    1255   1448#
NTRUPT  003452R           783#    1603
NULL  = 000000            302#    1541
NUMH    012523R          1833    1854    1860   1956   1970#
NXM     012354R          1274    1892#
NXTBBK  001136R           528#    637#    940    1434   1436   1440#
OPEN  = 000000            238     244     245    246    247    264    265    266    267    268    269    270    271
                          273     275     277    278    280    281    282    285    286    288    289    291    292
                          293     294     302#
OPIER   012424R          1325    1922#
OTOAS = 104420            302#    1165    1411   1417   1423   1429
PARPRE= 002000            302#
PARR    012450R          1347    1935#
PASCNT  000034R           252#
PATCH   012526R          1975#
PA1H    001126R           523#    769#    774
PA22    001132R           525#    775
PDPF11= 000002            302#
PDPLSI= 020000            302#
PDP44 = 100000            302#
PDP60 = 004000            302#
```



```
PDP70 = 010000            302#
PGERR   012360R          1277    1895#
PICKHK  003700R           692     812     846#   971
PICKOR  003606R           675     821#
PIRQS = 000004            302#    791
PUPSP = 005726            302#
POPSP2= 022626            302#
PRHMSS= 000002            302#
PRTY  = 000000            302#
PRTY0 = 000000            242     302#
PRTY1 = 000040            302#
PRTY2 = 000100            302#
PRTY3 = 000140            302#
PRTY4 = 000200            302#
PRTY5 = 000240            241     302#
PRTY6 = 000300            302#
PRTY7 = 000340            302#
PS    = 177776            302#
PSW   = 177776            302#
PUSH  = 005746            302#
PUSH2 = 024646            302#
PWRFLG= 000002            302#
QMON22= 000010            302#
RANDS = 104417            302#    862
RANNUM  000054R           260#    863     866    870
RBUF    001242R           284     579#   1148
RBUFEA  000130R           286#    744
RBUFPA  000126R           285#    696     740
RBUFSZ  000132R           287#    737    1149
RBUFVA  000124R           284#    669
READ    003116R           695     735#    736
READY   007514R           804     833    1466   1489#
RELESE  003212R           698     745#   1480
RESTRT  002604R           279     665     667#
RES1    000056R           262#    767    1591   1601#
RES2    000060R           263#
RESET   007670R           661    1530#
RHBA    002324R           608#    720*    730*   740*   769    775*   1555*
RHBAE   002370R           626#    776*   1596*
RHCS1   002320R           606#    746*    753*   756*   757    762*   781*   1194   1368   1387   1450   1454   1470
                         1490    1508    1525   1526   1533   1551*
RHCS2   002330R           610#    745*    752*   766*   1021*  1489*  1531*  1559*
RHCS3   002372R           627#   1598*
RHDB    002342R           615#   1235    1236*  1252   1254*  1569*
RHWC    002322R           607#    719*    729*   739*   1553*
RH70  = 000200            302#    507#    662    1593
RMRR    012454R          1350   1938#
RPAS    002336R           613#    760     761*   786    788*   1544   1545*  1565*
RPCC    002356R           621#   1581*
RPDA    002326R           609#    721*    731*   741*   1557*
RPDC    002354R           620#    722*    732*   742*   1579*
RPDS    002332R           611#   1493    1561*
RPDT    002346R           617#   1026    1032   1052   1054   1060   1062   1079   1086   1088   1096   1103   1105
                         1573#
RPEC1   002364R           624#   1587*
RPEC2   002366R           625#   1589*
```

```
RPER1   002334R          612#   1563*
RPER2   002360R          622#   1583*
RPER3   002362R          623#   1376   1585*
RPLA    002340R          614#   1567*
RPMR    002344R          616#   1571*
RPOF    002352R          619#    763*  1577*
RPSN    002350R          618#   1575*
RSTR1   000112R          279#
S       001052R          513#    582    583    584    585    586    587    588    589    590    591    592    593
                         594     595    596    597    598    599    600    601    602    603    666   1186   1198
                        1201    1203   1208   1213   1217   1221   1225   1229   1233   1266   1269   1272   1275
                        1278    1282   1289   1293   1296   1303   1307   1310   1315   1320   1323   1326   1329
                        1332    1335   1338   1341   1345   1348   1351   1354   1390*  1471*
SBADR   000102R          272#   1519*
SCERR   012334R         1232    1880#
SECLIM  001150R          541#    861    946   1000   1043*  1073*  1128*
SECLM1  001152R          542#    885    993    996   1004   1044*  1074*  1129*
SECMSK  001160R          545#    876   1040*  1070*  1125*
SECNO   010616R         1429    1650#
SECTOR  001166R          552#    857*   869*   881    884    887*   930    932*   941    967   1403
SETUP   007762R          660    1550#
SIZSEC  001206R          564#    945    998*
SIZTRK  001204R          563#    951    992*   995*  1007
SOFCNT  000042R          255#
SOFERR= 104406           302#   1245
SOFPAS  000046R          257#
SPOINT  000032R          251#   1483
SPSIZ = 000040             1#    295
SR1     000016R          244#    662    855    900    913    922   1190   1406   1593
SR2     000020R          245#
SR3     000022R          246#
SR4     000024R          247#
START   002374R          250     630#
STAT    000026R          249#
STOPE   001236R          577#   1235*  1254   1296*  1297*  1298   1310*  1311*  1312
SVR0    0000b2R          264#
SVR1    000064R          265#
SVR2    000066R          266#
SVR3    000070R          267#
SVR4    000072R          268#
SVR5    000074R          269#
SVR6    000076R          270#
SYSCNT  000052R          259#
TABLE   002242R          581#    664*   666*  1245   1250   1392   1473   1477
TIMER   001224R          572#
TOUT    012264R         1848#
TRACK   001167R          553#    879*   883*   890    893    896*   927    929*   942    963   1404
TRERR   012166R         1228    1809#
TRKLIM  001144R          539#    890    952    999   1041*  1071*  1126*
TRKLM1  001146R          540#    894   1010   1042*  1072*  1127*
TRKMSK  001156R          544#    868   1039*  1069*  1124*
TRKNO   010600R         1423    1647#
TRPDFD= 000023           302#
TRY     001234R          576#    678*   801*   802
TYPFLG  001142R          536#   1037*  1067*  1122*  1206   1374
UNITNO  001216R          568#    652*   671*   745    752    766    784    813*   822*   823   827   1021   1156
```



```
                        1165    1411   1489
UNKNWN  012250R         1840#
UNSER   012420R         1322    1919#
UPER    012344R         1268    1886#
USTACK= 000001           302#
VECTOR  000010R          240#   1602
WASADR  000104R          274#   1521#
WBUFEA  000136R          289#    724    734
WBUFPA  000134R          288#    720    730
WBUFRQ  000140R          290#
WBUFSZ  000142R          291#    717    727    989
WCEERR  012330R         1224    1877#
WCF     012500R         1340    1952#
WDER    000116R          281#    631*
WDTO    000114R          280#    630*
WLER    012434R         1331    1927#
WRITCK  003022R          694     725#   726
WRITE   002726R          693     715#   716
WRTLIM  004432R          677     979#
XFLAG   000005R          238#
XMEM    001130R          524#    724*   734*   744*   770*   771*   772*   773*   779*   780
ZERO    001226R          573#
.     = 012576R          579#    697   1644#  1647#  1650#  1969#  1971#
```

```
BKMOD       1#
BREAK       1#     747    1456    1459    1535
BTOD        1#
CKDATA      1#     696
CLKSP       1#
DATACK      1#
DATERR      1#
DFSEVN      1#     302
DSEVNT      1#     302
END         1#     684    1543
ENDIT       1#     685
ENDMOD      1#
EQUATS      1#     302
EXIT        1#     782
GETPA       1#     669
GWBUFF      1#     672
HRDER       1#    1248    1476    1540
IOMOD       1#
IOMODP      1#
IOMODR      1#
IOMODX      1#     230
LINEUP    702#     723     733     743
MAP22       1#     774
MODULE      1#     231
MSG         1#
MSGN        1#     655    1115    1184    1193    1197    1211    1216    1220    1224    1228    1232    1257    1265    1268
          1271    1274    1277    1280    1284    1287    1292    1295    1306    1309    1322    1325    1328    1331    1334
          1337    1340    1343    1347    1350    1353    1356    1432    1463    1482
MSGS        1#
NBKMOD      1#
OTOA        1#    1162    1408    1414    1420    1426
PIRQ        1#     790
RAND        1#     862
SBKMOD      1#
SOFER       1#    1244


. ABS.  000000     000
        012576     001

ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

XRMDB0,XRMDB0.SEQ/SOL/CRF/DOC=DDXCOM,XRMDB0
RUN-TIME:  2  5  .8 SECONDS
RUN-TIME RATIO: 38/9=4.1
CORE USED:  11K  (22 PAGES)

DOCUMENT PAGES:  47
```