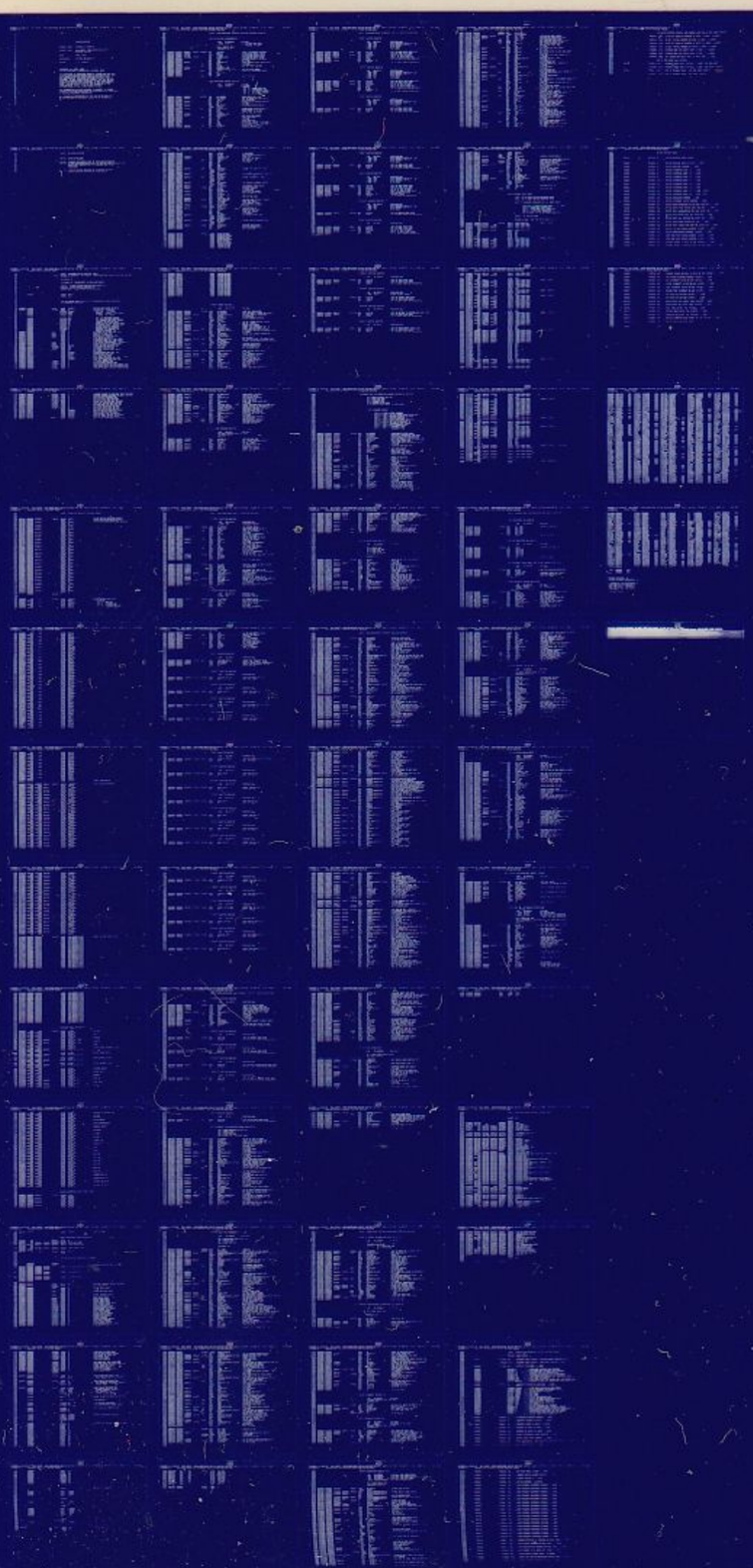
RP04/05/06

DEVICE ROUTINE (MPG)

MD-11-DTRPA-B

EP-DTRPA-B-DL-A NOV 1976

FICHE 1 OF 1 MADE IN U.S



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                        .REM    %


                                IDENTIFICATION
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PRODUCT CODE:           MAINDEC-11-DTRPA-B

PRODUCT NAME:           RH11/RH70 - RP04/RP05/RP06 DEVICE
                        ROUTINE FOR MPG

DATE:                   APRIL 1976

MAINTAINER:             SYSTEMS RELIABILITY

AUTHOR:                 C. E. HARPER
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                                .SBTTL  REVISION HISTORY


                        ;       APR 76  DTRPA-B RELEASE

                        ;       FEB 76  CHANGED THE DEVICE TYPE OF THIS DEVICE ROUTINE
                        ;       JAN 76  TO THE RP04/RP05/RP06 DISKS ON THE RH11/RH70 CONTROLLERS.
                        ;               ADDED FULL SUPPORT FOR I/O COMMANDS AND OTHER
                        ;               FUNCTIONS.

                        ;       AUG 75  DTRPA-A INITIAL RELEASE AS A MINIMUM SUPPORT
                        ;               DEVICE ROUTINE FOR THE RP11/RP03 DISK.
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                                        .SBTTL  STANDARD DEVICE ROUTINE TABLE
                                .TITLE  MAINDEC-11-DTRPA-B  RH11/RH70 - RP04/RP05/RP06 DEVICE ROUTINE FOR MPG

                                        ;REVISION 'B'

                                        ,FILENAME OF "TRPAB0.MPG" ON MPG/XXDP MEDIA

                                        ;MACY11:  DTRPA*,DTRPA*/CRF:SYM/DOC=DTRPA*.P11
                                        ;LNKX11:  DTRPA*.MPG/B:0+DTRPA*/E
                                        ;PAPER TAPE:  PUNCH DTRPA*.MPG/FILE:ELEV


000000'                                 .CSECT  RJP11
                                        .DSABL  GBL


                                        ;THE FOLLOWING TABLE IS IN THE STANDARDIZED FORMAT REQUIRED
                                        ;TO INTERFACE WITH MPG.

000000' 014002                  LOCZ:   .WORD   DVREND-.                ;DEVICE ROUT SIZE IN BYTES
000002' 000000                  DFLGWD: .WORD   0                       ;DEVICE ROUT FLAGWORD
                                        WAITMD= 100000                  ;  WAIT MD    - 0 = WAIT
                                        CORFLG= 2000                    ;  CORRECT MODE - 0 = CORON
                                        VVFLG=  1000                    ;  VV MODE    - 0 = VVON

                                        ANYIOI= 200                     ;  ANY I/O HAS BEEN ISSUED
                                        CMDISU= 100                     ;  I/O COMMAND HAS BEEN ISSUED
                                        SWOVTO= 40                      ;  TIMEOUT ON SWITCH OVER
                                        SWOIER= 20                      ;  ERROR ON INT FOR SWITCH OVER
                                        SWOVER= 10                      ;  ACQUIRING DISK - SWITCH OVER
                                        UNLDIP= 4                       ;  UNLOAD CMND IN PROGRESS
                                        DOTERM= 2                       ;  PROCESS I/O TERMINATION
                                        IOERR=  1                       ;  ERROR ON CURRENT I/O
000004' 000000                  CYL:    .WORD   0                       ;CYLINDER # (0 THRU 410./814.)
000006' 000000                  HEAD:   .WORD   0                       ;HEAD # (0 THRU 18.)
000010' 000000                  SECT:   .WORD   0                       ;SECTOR # (0 THRU 21./19.)
000012' 000003                  RTRY:   .WORD   3                       ;# OF RETRY ATTEMPTS
000014' 000000                          .WORD   0                       ;INTERFACE WORD # 5 (NOT USED)
000016' 000000                          .WORD   0                       ;INTERFACE WORD # 6 (NOT USED)
000020' 000000                  SIZE:   .WORD   0                       ;# OF BYTES TRANSFERRED / UNIMAP FLG
000022' 000000                  ERRI:   .WORD   0                       ;ERROR ON LAST I/O INDICATOR
000024' 176700                  DREGAD: .WORD   176700                  ;FIRST DEVICE REGISTER ADR
000026' 000254                  IVCTAD: .WORD   254                     ;INTERRUPT VECTOR ADR
000030' 000240                  PSWD:   .WORD   240                     ;INT PROC STATUS WORD (BR 5)
000032' 000000                          .WORD   0                       ;NOT USED
000034' 002414                          .WORD   HSKEEP-.                ;HOUSEKEEPING ROUT REL ADR
000036' 002472                          .WORD   REPORT-.                ;REPORT ROUT REL ADR
000040' 003330                          .WORD   KILL-.                  ;KILL ROUT REL ADR
000042' 002254                          .WORD   DATAER-.                ;DATA ERROR COUNTER REL ADR
000044' 003030                          .WORD   TOUTER-.                ;TIME OUT ERROR ROUT REL ADR
000046' 000000                  CIOBSY: .WORD   0                       ;I/O BUSY BRANCH ADR
000050' 000000                  CUPGER: .WORD   0                       ;DEVICE ERROR BRANCH ADR
000052' 000000                  ULIST:  .WORD   0                       ;USER MODE PRINT ROUTINE BRANCH ADR
000054' 000000                  CLIST:  .WORD   0                       ;CMND MODE PRINT ROUTINE BRANCH ADR
000056' 000000                  BINASC: .WORD   0                       ;CONVERT BINARY TO ASCII ROUT BR ADR
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  114  000060' 000000                BTASLZ: .WORD   0                       ;CONVERT BINARY TO DECIMAL ASCII BR ADR
  115  000062' 000000                DECASC: .WORD   0                       ;CONVERT PACKED DECIMAL TO ASCII BR ADR
  116  000064' 000000                CSYSFW: .WORD   0                       ;MPG SYSTEM FLAGWORD ADR
  117  000066' 000000                SETVEC: .WORD   0                       ;SET INT VECT ROUT BR ADR
  118  000070' 000000                CLRVEC: .WORD   0                       ;CLEAR INT VECTOR ROUT BR ADR
  119  000072' 000000                TSTVEC: .WORD   0                       ;TEST INT VECTOR ROUT BR ADR
  120  000074' 000000                RTNINT: .WORD   0                       ;RETURN FROM INT ROUT BR ADR
  121  000076' 000000                GETBYT: .WORD   0                       ;GET DATA BYTE ROUT BR ADR
  122  000100' 000000                PUTBYT: .WORD   0                       ;PUT DATA BYTE ROUT BR ADR
  123  000102' 000014                        .WORD   DVREGS-.                ;ADR OF DEVICE REGISTER NAMES
  124  000104' 000216                        .WORD   DVCMDS-.                ;ADR OF DEVICE FUNCTIONS
  125  000106' 000452                        .WORD   DVPKTE-.                ;ADR OF PACK TBL EXTENSION
  126  000110' 001120                        .WORD   DVMVTE-.                ;ADR OF MODEL VECTOR TBL EXTEN.
  127  000112' 001342                        .WORD   DVCPTE-.                ;ADR OF COMPILER TBL EXTEN.
  128  000114' 001740                        .WORD   DVIWST-.                ;ADR OF DEV INTERFACE WD SYM TBL
```

```
                                        .SBTTL  COMPILER TABLES & CONSTANT AREAS
                                
                                
                                
000116' 050122  030503          DVREGS: .ASCII  /RPC1/                  ;VALID DEVICE REGISTER NAMES &
000122' 000000                          .WORD   0                       ;THEIR POSITIONS RELATIVE TO
000124' 050122  041527                  .ASCII  /RPWC/                  ;THE DEVICE REGISTERS BASE ADDRESS.
000130' 000002                          .WORD   2
000132' 050122  040502                  .ASCII  /RPBA/
000136' 000004                          .WORD   4
000140' 050122  040504                  .ASCII  /RPDA/
000144' 000006                          .WORD   6
000146' 050122  031103                  .ASCII  /RPC2/
000152' 000010                          .WORD   10
000154' 050122  051504                  .ASCII  /RPDS/
000160' 000012                          .WORD   12
000162' 050122  030505                  .ASCII  /RPE1/
000166' 000014                          .WORD   14
000170' 050122  051501                  .ASCII  /RPAS/
000174' 000016                          .WORD   16
000176' 050122  040514                  .ASCII  /RPLA/
000202' 000020                          .WORD   20
000204' 050122  041104                  .ASCII  /RPDB/
000210' 000022                          .WORD   22
000212' 050122  051115                  .ASCII  /RPMR/
000216' 000024                          .WORD   24
000220' 050122  052104                  .ASCII  /RPDT/
000224' 000026                          .WORD   26
000226' 050122  047123                  .ASCII  /RPSN/
000232' 000030                          .WORD   30
000234' 050122  043117                  .ASCII  /RPOF/
000240' 000032                          .WORD   32
000242' 050122  041504                  .ASCII  /RPDC/
000246' 000034                          .WORD   34
000250' 050122  041503                  .ASCII  /RPCC/
000254' 000036                          .WORD   36
000256' 050122  031105                  .ASCII  /RPE2/
000262' 000040                          .WORD   40
000264' 050122  031505                  .ASCII  /RPE3/
000270' 000042                          .WORD   42
000272' 050122  047520                  .ASCII  /RPPO/
000276' 000044                          .WORD   44
000300' 050122  040520                  .ASCII  /RPPA/
000304' 000046                          .WORD   46
000306' 050122  042501                  .ASCII  /RPAE/
000312' 000050                          .WORD   50
000314' 050122  031503                  .ASCII  /RPC3/
000320' 000052                          .WORD   52
        000322'                 DVREGE= .
                                
                                
000322'    120      211         DVCMDS: .BYTE   120,211                 ;VALID DEVICE FUNCTIONS
000324' 004636                          .WORD   READ-.                  ;  FLAG BYTE:
000326'    130      211                 .BYTE   130,211                 ;    BIT 7 = NPR DEV
000330' 004662                          .WORD   WRITE-.                 ;    BIT 3 = MASSBUS DEV
000332'    376      000                 .BYTE   376,0                   ;    BIT 0 = 2 WORDS FOR ADR
000334' 003322                          .WORD   NOWAIT-.                ;            (18 BIT ADRS)
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  186  000336'    375     000              .BYTE   375,0
  187  000340' 003276                      .WORD   WAIT-.
  188  000342'    374     000              .BYTE   374,0
  189  000344' 002164                      .WORD   REPORT-.
  190  000346'    373     000              .BYTE   373,0
  191  000350' 002160                      .WORD   REPORT-.
  192  000352'    372     000              .BYTE   372,0
  193  000354' 004750                      .WORD   SEEK-.
  194  000356'    371     211              .BYTE   371,211
  195  000360' 004736                      .WORD   WRCKHD-.
  196  000362'    370     211              .BYTE   370,211
  197  000364' 004702                      .WORD   WRCK-.
  198  000366'    367     211              .BYTE   367,211
  199  000370' 004652                      .WORD   RDHD-.
  200  000372'    366     211              .BYTE   366,211
  201  000374' 004660                      .WORD   WRHD-.
  202  000376'    365     000              .BYTE   365,0
  203  000400' 003466                      .WORD   CRESET-.
  204  000402'    364     000              .BYTE   364,0
  205  000404' 003532                      .WORD   DRESET-.
  206  000406'    363     000              .BYTE   363,0
  207  000410' 004736                      .WORD   SEARCH-.
  208  000412'    362     000              .BYTE   362,0
  209  000414' 003006                      .WORD   STEPUP-.
  210  000416'    361     000              .BYTE   361,0
  211  000420' 003150                      .WORD   STEPDN-.
  212  000422'    360     000              .BYTE   360,0
  213  000424' 004734                      .WORD   OFFSET-.
  214  000426'    357     000              .BYTE   357,0
  215  000430' 004742                      .WORD   RETCTR-.
  216  000432'    356     000              .BYTE   356,0
  217  000434' 003510                      .WORD   UNLOAD-.
  218  000436'    355     000              .BYTE   355,0
  219  000440' 004744                      .WORD   RECAL-.
  220  000442'    354     000              .BYTE   354,0
  221  000444' 003506                      .WORD   PAKACK-.
  222  000446'    353     000              .BYTE   353,0
  223  000450' 003510                      .WORD   RDPSET-.
  224  000452'    352     000              .BYTE   352,0
  225  000454' 003512                      .WORD   REL-.
  226  000456'    351     000              .BYTE   351,0
  227  000460' 003206                      .WORD   APORT-.
  228  000462'    350     000              .BYTE   350,0
  229  000464' 003212                      .WORD   BPORT-.
  230  000466'    347     000              .BYTE   347,0
  231  000470' 003356                      .WORD   FMT22-.
  232  000472'    346     000              .BYTE   346,0
  233  000474' 003362                      .WORD   FMT20-.
  234  000476'    345     000              .BYTE   345,0
  235  000500' 003206                      .WORD   ODD-.
  236  000502'    344     000              .BYTE   344,0
  237  000504' 003212                      .WORD   EVEN-.
  238  000506'    343     000              .BYTE   343,0
  239  000510' 003216                      .WORD   ECION-.
  240  000512'    342     000              .BYTE   342,0
  241  000514' 003222                      .WORD   ECIOFF-.
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000516'    341     000                       .BYTE   341,0
000520'  003226                              .WORD   HCION-.
000522'    340     000                       .BYTE   340,0
000524'  003232                              .WORD   HCIOFF-.
000526'    337     000                       .BYTE   337,0
000530'  003236                              .WORD   BAION-.
000532'    336     000                       .BYTE   336,0
000534'  003242                              .WORD   BAIOFF-.
000536'    335     000                       .BYTE   335,0
000540'  003246                              .WORD   CORON-.
000542'    334     000                       .BYTE   334,0
000544'  003252                              .WORD   COROFF-.
000546'    333     000                       .BYTE   333,0
000550'  003256                              .WORD   VVON-.
000552'    332     000                       .BYTE   332,0
000554'  003262                              .WORD   VVOFF-.
000556'  177777                              .WORD   177777                  ;TABLE TERMINATOR

000560'  047516  040527  052111   DVPKTE:   .ASCII  /NOWAIT/                ;PACK TABLE EXTENSION
000566'    376     000                       .BYTE   376,0
000570'  020040  040527  052111             .ASCII  /  WAIT/
000576'    375     000                       .BYTE   375,0
000600'  052123  052101  051525             .ASCII  /STATUS/
000606'    374     000                       .BYTE   374,0
000610'  047503  047125  051524             .ASCII  /COUNTS/
000616'    373     000                       .BYTE   373,0
000620'  020040  042523  045505             .ASCII  /  SEEK/
000626'    372     000                       .BYTE   372,0
000630'  051127  045503  042110             .ASCII  /WRCKHD/
000636'    371     000                       .BYTE   371,0
000640'  020040  051127  045503             .ASCII  /  WRCK/
000646'    370     000                       .BYTE   370,0
000650'  020040  042122  042110             .ASCII  /  RDHD/
000656'    367     000                       .BYTE   367,0
000660'  020040  051127  042110             .ASCII  /  WRHD/
000666'    366     000                       .BYTE   366,0
000670'  051103  051505  052105             .ASCII  /CRESET/
000676'    365     000                       .BYTE   365,0
000700'  051104  051505  052105             .ASCII  /DRESET/
000706'    364     000                       .BYTE   364,0
000710'  042523  051101  044103             .ASCII  /SEARCH/
000716'    363     000                       .BYTE   363,0
000720'  052123  050105  050125             .ASCII  /STEPUP/
000726'    362     000                       .BYTE   362,0
000730'  052123  050105  047104             .ASCII  /STEPDN/
000736'    361     000                       .BYTE   361,0
000740'  043117  051506  052105             .ASCII  /OFFSET/
000746'    360     000                       .BYTE   360,0
000750'  042522  041524  051124             .ASCII  /RETCTR/
000756'    357     000                       .BYTE   357,0
000760'  047125  047514  042101             .ASCII  /UNLOAD/
000766'    356     000                       .BYTE   356,0
000770'  051040  041505  046101             .ASCII  / RECAL/
000776'    355     000                       .BYTE   355,0
001000'  040520  040513  045503             .ASCII  /PAKACK/
001006'    354     000                       .BYTE   354,0
```

```
                                                .ASCII  /RDPSET/
                                                .BYTE   353,0
                                                .ASCII  /   REL/
                                                .BYTE   352,0
                                                .ASCII  / APORT/
                                                .BYTE   351,0
                                                .ASCII  / BPORT/
                                                .BYTE   350,0
                                                .ASCII  / FMT22/
                                                .BYTE   347,0
                                                .ASCII  / FMT20/
                                                .BYTE   346,0
                                                .ASCII  /   ODD/
                                                .BYTE   345,0
                                                .ASCII  /  EVEN/
                                                .BYTE   344,0
                                                .ASCII  / ECION/
                                                .BYTE   343,0
                                                .ASCII  /ECIOFF/
                                                .BYTE   342,0
                                                .ASCII  / HCION/
                                                .BYTE   341,0
                                                .ASCII  /HCIOFF/
                                                .BYTE   340,0
                                                .ASCII  / BAION/
                                                .BYTE   337,0
                                                .ASCII  /BAIOFF/
                                                .BYTE   336,0
                                                .ASCII  / CORON/
                                                .BYTE   335,0
                                                .ASCII  /COROFF/
                                                .BYTE   334,0
                                                .ASCII  /  VVON/
                                                .BYTE   333,0
                                                .ASCII  / VVOFF/
                                                .BYTE   332,0

DVMVTE:                                         .WORD   376,MSFMT1-LOCZ         ;MODEL VECTOR TABLE EXTEN.
                                                .WORD   375,MSFMT1-LOCZ
                                                .WORD   374,MSFMT1-LOCZ
                                                .WORD   373,MSFMT1-LOCZ
                                                .WORD   372,MSFMT1-LOCZ
                                                .WORD   371,MSFMT2-LOCZ
                                                .WORD   370,MSFMT2-LOCZ
                                                .WORD   367,MSFMT3-LOCZ
                                                .WORD   366,MSFMT4-LOCZ
                                                .WORD   365,MSFMT1-LOCZ
                                                .WORD   364,MSFMT1-LOCZ
                                                .WORD   363,MSFMT1-LOCZ
                                                .WORD   362,MSFMT5-LOCZ
                                                .WORD   361,MSFMT5-LOCZ
                                                .WORD   360,MSFMT5-LOCZ
                                                .WORD   357,MSFMT1-LOCZ
                                                .WORD   356,MSFMT1-LOCZ
                                                .WORD   355,MSFMT1-LOCZ
                                                .WORD   354,MSFMT1-LOCZ
```

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001344' 000353 002106                   .WORD   353,MSFMT1-LOCZ
001350' 000352 002106                   .WORD   352,MSFMT1-LOCZ
001354' 000351 002106                   .WORD   351,MSFMT1-LOCZ
001360' 000350 002106                   .WORD   350,MSFMT1-LOCZ
001364' 000347 002106                   .WORD   347,MSFMT1-LOCZ
001370' 000346 002106                   .WORD   346,MSFMT1-LOCZ
001374' 000345 002106                   .WORD   345,MSFMT1-LOCZ
001400' 000344 002106                   .WORD   344,MSFMT1-LOCZ
001404' 000343 002106                   .WORD   343,MSFMT1-LOCZ
001410' 000342 002106                   .WORD   342,MSFMT1-LOCZ
001414' 000341 002106                   .WORD   341,MSFMT1-LOCZ
001420' 000340 002106                   .WORD   340,MSFMT1-LOCZ
001424' 000337 002106                   .WORD   337,MSFMT1-LOCZ
001430' 000336 002106                   .WORD   336,MSFMT1-LOCZ
001434' 000335 002106                   .WORD   335,MSFMT1-LOCZ
001440' 000334 002106                   .WORD   334,MSFMT1-LOCZ
001444' 000333 002106                   .WORD   333,MSFMT1-LOCZ
001450' 000332 002106                   .WORD   332,MSFMT1-LOCZ

                                ;
                                ;       COMPILER TABLE EXTENSION
                                ;
001454'    003    376           DVCPTE: .BYTE   3,376                   ;NO WAIT
001456' 004537 000012                   .WORD   4537,10.
001462'    003    375                   .BYTE   3,375                   ;WAIT
001464' 004537 000012                   .WORD   4537,10.
001470'    004    374                   .BYTE   4,374                   ;STATUS
001472' 004537 000012 001002            .WORD   4537,10.,1002
001500'    004    373                   .BYTE   4,373                   ;COUNTS
001502' 004537 000012 001001            .WORD   4537,10.,1001
001510'    003    372                   .BYTE   3,372                   ;SEEK
001512' 004537 000012                   .WORD   4537,10.
001516'    006    371                   .BYTE   6,371                   ;WRITE CHECK HEADER & DATA
001520' 004537 000012 000000            .WORD   4537,10.,0,2,2
001526' 000002 000002
001532'    006    370                   .BYTE   6,370                   ;WRITE CHECK DATA
001534' 004537 000012 000000            .WORD   4537,10.,0,2,2
001542' 000002 000002
001546'    006    367                   .BYTE   6,367                   ;READ HEADER & DATA
001550' 004537 000012 000000            .WORD   4537,10.,0,2,2
001556' 000002 000002
001562'    006    366                   .BYTE   6,366                   ;WRITE HEADER & DATA
001564' 004537 000012 000000            .WORD   4537,10.,0,2,2
001572' 000002 000002
001576'    003    365                   .BYTE   3,365                   ;CONTROL RESET
001600' 004537 000012                   .WORD   4537,10.
001604'    003    364                   .BYTE   3,364                   ;DRIVE RESET
001606' 004537 000012                   .WORD   4537,10.
001612'    003    363                   .BYTE   3,363                   ;SEARCH
001614' 004537 000012                   .WORD   4537,10.
001620'    004    362                   .BYTE   4,362                   ;STEP UP
001622' 004537 000012 000000            .WORD   4537,10.,0
001630'    004    361                   .BYTE   4,361                   ;STEP DOWN
001632' 004537 000012 000000            .WORD   4537,10.,0
001640'    004    360                   .BYTE   4,360                   ;OFFSET
001642' 004537 000012 000000            .WORD   4537,10.,0
```

```
001650'    003     357                .BYTE   3,357          ;RETURN TO CENTERLINE
001652' 004537  000012                .WORD   4537,10.
001656'    003     356                .BYTE   3,356          ;UNLOAD
001660' 004537  000012                .WORD   4537,10.
001664'    003     355                .BYTE   3,355          ;RECALIBRATE
001666' 004537  000012                .WORD   4537,10.
001672'    003     354                .BYTE   3,354          ;PACK ACKNOWLEDGE
001674' 004537  000012                .WORD   4537,10.
001700'    003     353                .BYTE   3,353          ;READIN PRESET
001702' 004537  000012                .WORD   4537,10.
001706'    003     352                .BYTE   3,352          ;RELEASE
001710' 004537  000012                .WORD   4537,10.
001714'    003     351                .BYTE   3,351          ;A PORT
001716' 004537  000012                .WORD   4537,10.
001722'    003     350                .BYTE   3,350          ;B PORT
001724' 004537  000012                .WORD   4537,10.
001730'    003     347                .BYTE   3,347          ;FORMAT 22
001732' 004537  000012                .WORD   4537,10
001736'    003     346                .BYTE   3,346          ;FORMAT 20
001740' 004537  000012                .WORD   4537,10.
001744'    003     345                .BYTE   3,345          ;ODD
001746' 004537  000012                .WORD   4537,10.
001752'    003     344                .BYTE   3,344          ;EVEN
001754' 004537  000012                .WORD   4537,10.
001760'    003     343                .BYTE   3,343          ;ECI ON
001762' 004537  000012                .WORD   4537,10.
001766'    003     342                .BYTE   3,342          ;ECI OFF
001770' 004537  000012                .WORD   4537,10.
001774'    003     341                .BYTE   3,341          ;HCI ON
001776' 004537  000012                .WORD   4537,10.
002002'    003     340                .BYTE   3,340          ;HCI OFF
002004' 004537  000012                .WORD   4537,10.
002010'    003     337                .BYTE   3,337          ;BAI ON
002012' 004537  000012                .WORD   4537,10.
002016'    003     336                .BYTE   3,336          ;BAI OFF
002020' 004537  000012                .WORD   4537,10.
002024'    003     335                .BYTE   3,335          ;CORRECTION ON
002026' 004537  000012                .WORD   4537,10.
002032'    003     334                .BYTE   3,334          ;CORRECTION OFF
002034' 004537  000012                .WORD   4537,10.
002040'    003     333                .BYTE   3,333          ;VOLUME VALID ON
002042' 004537  000012                .WORD   4537,10.
002046'    003     332                .BYTE   3,332          ;VOLUME VALID OFF
002050' 004537  000012                .WORD   4537,10.

                             ;
                             ;        DEVICE INTERFACE WORD SYMBOL TABLE
                             ;
002054' 054503  020114       DVIWST:  .ASCII  /CYL /
002060' 000004                        .WORD   DEVIW1
002062' 042510  042101                .ASCII  /HEAD/
002066' 000006                        .WORD   DEVIW2
002070' 042523  052103                .ASCII  /SECT/
002074' 000010                        .WORD   DEVIW3
002076' 052122  054522                .ASCII  /RTRY/
002102' 000012                        .WORD   DEVIW4
```

```
                                                .WORD   177777                  ;END OF TABLE

                                                ;
                                                ;       MODEL STATEMENT TABLE EXTENSION
                                                ;
002106' 000                             MSFMT1: .BYTE   0
002107' 377 052101 000377               MSFMT2: .ASCIZ  <377>/AT/<377>
002114' 044777 052116 177517            MSFMT3: .ASCIZ  <377>/INTO/<377>
002122' 000
002123' 377 051106 046517               MSFMT4: .ASCIZ  <377>/FROM/<377>
002130' 000377
002132' 377 000                         MSFMT5: .BYTE   377,0
                                                .EVEN


                                                ;DEVICE ROUTINE CONSTANTS & EQUATES


002134'                                 HSKPST= .
002134'                                 ISTAT=  .                               ;STORAGE FOR DEV REG'S AT INT
002134' 000000 000000 000000                    .WORD   0,0,0,0,0,0,0,0
002142' 000000 000000 000000
002150' 000000 000000
002154' 000000 000000 000000                    .WORD   0,0,0,0,0,0,0
002162' 000000 000000 000000
002170' 000000
002172' 000000 000000 000000                    .WORD   0,0,0,0,0,0,0
002200' 000000 000000 000000
002206' 000000


002210' 000026                          CSTAT:  .BLKW   22.                     ;DEV REG CURRENT VALUES STORAGE
002264'                                 COUNTS:
002264' 000000                          BYRD:   .WORD   0                       ;BYTES READ COUNT
002266' 000000                                  .WORD   0
002270' 000000                          BYWR:   .WORD   0                       ;BYTES WRITTEN COUNT
002272' 000000                                  .WORD   0
002274' 000000                          BYCK:   .WORD   0                       ;BYTES CHECKED COUNT
002276' 000000                                  .WORD   0
002300' 000000                          RDCNT:  .WORD   0                       ;READ CMND COUNT
002302' 000000                          WRCNT:  .WORD   0                       ;WRITE CMND COUNT
002304' 000000                          CKCNT:  .WORD   0                       ;CHECK CMND COUNT
002306' 000000                          SKCNT:  .WORD   0                       ;SEEK/SEARCH CMND COUNT
002310' 000000                          MISCNT: .WORD   0                       ;MISC. CMND COUNT
002312' 000000                          ERRCNT: .WORD   0                       ;DEVICE ERRORS COUNT
002314' 000000                          CECCER: .WORD   0                       ;CORRECTABLE ECC ERRORS
002316' 000000                          DATAER: .WORD   0                       ;DATA ERRORS COUNT
002320' 000000                          DLTCNT: .WORD   0                       ;DATA LATE ERRORS
002322' 000000                          DTECNT: .WORD   0                       ;DRIVE TIMING ERRORS
002324' 000000                          HCRCNT: .WORD   0                       ;HEADER CRC ERRORS
002326' 000000                          FERCNT: .WORD   0                       ;FORMAT ERRORS
002330' 000000                          HCECNT: .WORD   0                       ;HEADER COMPARE ERRORS
002332' 000000                          DCKCNT: .WORD   0                       ;DATA CHECK ERRORS
002334' 000000                          WCECNT: .WORD   0                       ;WRITE CHECK ERRORS
002336  000000                          RETRYS: .WORD   0                       ;# OF RETRIES ON I/O CMNDS
002340' 000000                          INTCNT: .WORD   0                       ;INTERRUPTS COUNT
```

```
                002342' 000000          ERRADR: .WORD   0               ;CURR ADR IN USER PROG
                002344' 000000          CNTADR: .WORD   0               ;ADR OF BYTE COUNT TOTALS
                002346' 000000          CURFLG: .WORD   0               ;FLAG WORD OF CURR CMND
                002350' 000000          CURCMD: .WORD   0               ;CURR CMND CODE
                002352' 000000          CURADR: .WORD   0               ;CURR BUS ADDRESS
                002354' 000000                  .WORD   0
                002356' 000000          CURCNT: .WORD   0               ;NEG WORD CNT FOR CURR CMND
                002360' 000000          CURPBC: .WORD   0               ;POSITIVE BYTE CNT FOR CURR CMND
                002362' 000000          FINCNT: .WORD   0               ;FINAL WORD CNT (RPWC)
                002364' 000000          CURRTY: .WORD   0               ;CURR RETRY COUNT
                002366' 000000          RTRYIP: .WORD   0               ;RETRY IN PROGRESS FLAG
                002370' 000000          CURPSW: .WORD   0               ;PSW STORAGE AREA
                        002372'         HSKPEN= .

                002372' 000000          RPCS1V: .WORD   0               ;BASE VALUE FOR RPCS1 REG
                        002000                  PORT=   2000            ;  PORT SELECT BIT - 1 = PORT B

                002374' 000000          RPCS2V: .WORD   0               ;BASE VALUE FOR RPCS2 REG
                        000010                  BAI=    10              ;  BUS ADDRESS INCREMENT INHIBIT = 1
                        000020                  PARITY= 20              ;  PARITY MODE - 1 = EVEN

                002376' 010000          RPOFV:  .WORD   10000           ;BASE VALUE FOR RPOF REG
                        002000                  HCI=    2000            ;  HEADER COMPARE INHIBIT = 1
                        004000                  ECI=    4000            ;  ECC INHIBIT = 1
                        010000                  FMT22B= 10000           ;  FORMAT 16 BIT WORDS = 1

                        000000                  XXXX=   0               ;VALUE TO BE TAILORED BY DEV ROUT

                        177776                  PS=     177776          ;PSW ADDRESS

                        000026                  REGNUM= 22.             ;# OF DEVICE REGISTERS
                        000027                  CNTNUM= 23.             ;# OF STATISTICAL COUNT WORDS

                        000001                  MMVER=  1               ;SYS FLGWD BIT DEFINITIONS
                        000002                  USMTPS= 2
                        000010                  CPU70=  10

                        172350                  KPAR4=  172350          ;MEMORY MANAGEMENT EQUATES
                        172310                  KPDR4=  172310
                        100000                  P4CONS= 100000
                        077406                  PDRCON= 077406

                        000000                  RPCS1=  0               ;EQUATES FOR DEVICE REGISTER NAMES
                        000002                  RPWC=   2
                        000004                  RPBA=   4
                        000006                  RPDA=   6
                        000010                  RPCS2=  10
                        000012                  RPDS=   12
                        000014                  RPER1=  14
                        000016                  RPAS=   16
                        000020                  RPLA=   20
                        000022                  RPDB=   22
                        000024                  RPMR=   24
                        000026                  RPDT=   26
                        000030                  RPSN=   30
                        000032                  RPOF=   32
```

```
                                RPDC=   34
                                RPCC=   36
                                RPER2=  40
                                RPER3=  42
                                RPEC1=  44
                                RPEC2=  46
                                RPBAE=  50
                                RPCS3=  52


                                ;RPCS1                          DEVICE BIT EQUATES

                        040000  TRE=    40000
                        020000  MCPE=   20000
                        004000  DVA=    4000

                                ;RPCS2

                        010000  NED=    10000

                                ;RPDS

                        100000  ATA=    100000
                        040000  ERR=    40000
                        010000  MOL=    10000
                        000400  DPR=    400
                        000100  VV=     100

                                ;RPER1

                        040000  UNS=    40000


002400'                 PATCH:  .REPT   20.                     ;PATCH AREA
                                .WORD   0
                                .ENDR
```

```
                                        .SBTTL  RP04/RP05/RP06 SUPPORT ROUTINES ENTERED FROM MPG


                                        ;DEVICE ROUTINE HOUSEKEEPING

                                                ;JSR    R5,HSKEEP       S/R CALL
                                                ;.WORD  0 OR 1          0 = DO HSKP PER OPSW
                                                ;                       1 = UNCOND. DO HSKP
                                                ;R2 = PROG'S OPSW
                                                ;DESTROYS R0,R1

002450' 012767  000003  175334  HSKEEP:  MOV     #3,RTRY                 ;INIT # OF RETRY ATTEMPTS
002456' 005067  177710                   CLR     RPCS1V                  ;INITIALIZE RPCS1 VALUE
002462' 005067  177706                   CLR     RPCS2V                  ;INITIALIZE RPCS2 VALUE
002466' 012767  010000  177702           MOV     #10000,RPOFV            ;INITIALIZE RPOF VALUE
002474' 005725                           TST     (R5)+                   ;UNCONDITIONALLY DO HSKP?
002476' 001003                           BNE     10$                     ;N,Y-10$
002500' 032702  000004                   BIT     #HSKPEP,R2              ;OPSW SPECIFY EACH PASS HSKP?
002504' 001010                           BNE     30$                     ;Y,N-30$
002506' 010700                  10$:     MOV     PC,R0                   ;SET UP FIRST WD ADR
002510' 062700  177424                   ADD     #HSKPST-.,R0
002514' 012701  000117                   MOV     #HSKPEN-HSKPST/2,R1     ;SET UP # OF WORDS
002520' 005020                  20$:     CLR     (R0)+                   ;HSKP ALL NECESSARY AREAS
002522' 005301                           DEC     R1
002524' 001375                           BNE     20$
002526' 000205                  30$:     RTS     R5                      ;EXIT IN-LINE


                                        ;RP04/RP05/RP06 REPORT ROUTINE

                                                ;JSR    R5,REPORT       S/R CALL
                                                ;.WORD  FLGWD           FLAGWORD
                                                ;                         BIT 15 = CMND MODE CALL
                                                ;                         BIT  9 = PROG STMNT CALL
                                                ;                         BIT  1 = DO STATUS REPORT
                                                ;                         BIT  0 = DO COUNTS REPORT

002530' 004067  006604          REPORT:  JSR     R0,SAVREG               ;SAVE REG'S R0 - R5
002534' 004767  006632                   JSR     PC,SUPTAD               ;SET UP PROG TBL ADR IN R3
002540' 011504                           MOV     (R5),R4                 ;GET FLAGWORD
002542' 032704  000002                   BIT     #2,R4                   ;GOING TO DO STATUS DISPLAY?
002546' 001403                           BEQ     5$                      ;Y,N-5$
002550' 004567  006636                   JSR     R5,STSTAT               ;GO STORE STATUS REG'S
002554' 177434                           .WORD   CSTAT-.
002556' 032704  177776          5$:      BIT     #177776,R4              ;DISPLAYING CNTS AT END OF
002562' 001012                           BNE     15$                     ;PROG PASS? (Y,N-15$)
002564' 010700                           MOV     PC,R0                   ;SET UP ADR OF CNTS
002566' 062700  177476                   ADD     #COUNTS-.,R0
002572' 012701  000027                   MOV     #CNTNUM,R1              ;GET # OF CNT WORDS
002576' 005720                  10$:     TST     (R0)+                   ;THIS CNT WORD = 0?
002600' 001003                           BNE     15$                     ;Y,N-15$
002602' 005301                           DEC     R1                      ;DECR WORD CNT
002604' 001374                           BNE     10$                     ;CK'ED ALL WORDS? (Y,N-10$)
002606' 000477                           BR      DVREX                   ;GO TO EXIT -- ALL CNTS ARE 0'S
002610' 004767  006706          15$:     JSR     PC,DEVID                ;DISPLAY DEVICE I.D.
002614' 032704  000002                   BIT     #2,R4                   ;DOING STATUS DISPLAY?
```

```
                                                BEQ     DISCNT                  ;Y,N-DISCNT
                                                MOV     PC,R0                   ;SET UP ADR OF REG'S AT
                                                ADD     #ISTAT-.,R0             ;LAST INT
                                                MOV     #REGNUM,R1              ;SET UP # OF REG'S
                                        20$:    TST     (R0)+                   ;ALL REG'S = 0?
                                                BNE     30$                     ;N,Y-40$
                                                DEC     R1
                                                BNE     20$
                                                BR      40$
                                        30$:    JSR     R5,PRINT                ;ISSUE 'AT LAST INT' MSG
                                                .WORD   ATIMSG-.
                                                .WORD   12.
                                                JSR     R5,DISPST               ;GO DISPLAY STATUS AT LAST INT
                                                .WORD   ISTAT-.
                                        40$:    JSR     R5,PRINT                ;ISSUE 'CURRENTLY' MSG
                                                .WORD   CURMSG-.
                                                .WORD   10.
                                                JSR     R5,DISPST               ;GO DISPLAY CURRENT STATUS
                                                .WORD   CSTAT-.
                                                JSR     PC,PRTIWD               ;GO DISPLAY INFO WORDS
                                        DISCNT: BIT     #1,R4                   ;DISPLAY COUNTS?
                                                BEQ     RPTEND                  ;Y,N-RPTEND
                                                MOV     #CNTNUM,R0              ;SET UP # OF WORDS
                                                MOV     PC,R1                   ;SET UP ADR OF CNTS
                                                ADD     #COUNTS-.,R1
                                                MOV     PC,R2                   ;SET UP TBL ADR
                                                ADD     #REPTBL-.,R2
                                        RPTLP:  MOV     (R2)+,RPTBAS            ;MOV MSG ADR TO S/R LINKAGE
                                                JSR     R0,SAVREG               ;SAVE ALL REG'S
                                                MOV     (R1),R0                 ;GET CURRENT COUNT
                                                JSR     R5,@#INASC              ;CONVERT IT TO ASCII
                                        RPTBAS: .WORD   XXXX
                                                JSR     R0,RESREG               ;RESTORE REG'S
                                                TST     (R1)+                   ;POINT AT NXT CNT
                                                DEC     R0                      ;DONE ALL WORDS?
                                                BNE     RPTLP                   ;Y,N-RPTLP
                                                JSR     R5,PRINT                ;GO ISSUE COUNTS MSG
                                                .WORD   CNTSMG-.
                                                .WORD   CNTSEN-CNTSMG
                                        RPTEND: JSR     R5,PRINT                ;ISSUE "END OF REPORT" MSG
                                                .WORD   RENDMG-.
                                                .WORD   -13.
                                        DVREX:  JSR     R0,RESREG               ;RESTORE REGISTERS
                                                TST     (R5)+                   ;SET UP RETURN POINT
                                                RTS     R5                      ;EXIT IN-LINE


                                        REPTBL: .WORD   BCMRD-RPTBAS
                                                .WORD   BCMRD+6-RPTBAS
                                                .WORD   BCMWR-RPTBAS
                                                .WORD   BCMWR+6-RPTBAS
                                                .WORD   BCMCK-RPTBAS
                                                .WORD   BCMCK+6-RPTBAS
                                                .WORD   CMDCRD-RPTBAS
                                                .WORD   CMDCWR-RPTBAS
                                                .WORD   CMDCCK-RPTBAS
```

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003040' 007617                          .WORD   CMDCSK-RPTBAS
003042' 007634                          .WORD   CMDCMS-RPTBAS
003044' 007662                          .WORD   CNTERR-RPTBAS
003046' 007703                          .WORD   CNTCEC-RPTBAS
003050' 007720                          .WORD   CNTDER-RPTBAS
003052' 007746                          .WORD   CNTDLT-RPTBAS
003054' 007762                          .WORD   CNTDTE-RPTBAS
003056' 007777                          .WORD   CNTHCR-RPTBAS
003060' 010016                          .WORD   CNTFER-RPTBAS
003062' 010032                          .WORD   CNTHCE-RPTBAS
003064' 010046                          .WORD   CNTDCK-RPTBAS
003066' 010065                          .WORD   CNTWCE-RPTBAS
003070' 010114                          .WORD   CNTRTY-RPTBAS
003072' 010142                          .WORD   CNTINT-RPTBAS


                                        ;TIMEOUT ERROR ROUTINE

                                                ;JSR    R5,TOUTER       S/R CALL

003074' 004067  006240          TOUTER: JSR     R0,SAVREG               ;SAVE ALL REGISTERS
003100' 004767  006266                  JSR     PC,SUPTAD               ;SET UP RPCS1 & PROG TBL ADR'S
003104' 032767  000004  174670          BIT     #UNLDIP,DFLGWD          ;UNLOAD CMND IN PROGRESS?
003112' 001037                          BNE     CKUNLD                  ;N,Y-CKUNLD
003114' 004567  006272                  JSR     R5,STSTAT               ;STORE CURRENT STATUS
003120' 177070                          .WORD   CSTAT-.
003122' 004567  004526                  JSR     R5,TVECT                ;CK IF I HAVE VECTOR CONTROL
003126' 000404                          BR      10$                     ;BR IF I DON'T
003130' 142714  000100                  BICB    #100,(R4)               ;RESET INT ENABLE
003134' 004767  004470                  JSR     PC,RINTV                ;RESET THE INTERRUPT VEC  R
003140' 042713  000010          10$:    BIC     #WT4IOT,(R3)            ;RESET WAITING FOR I/O F_G
003144' 032767  000010  174630          BIT     #SWOVER,DFLGWD          ;T/O WHILE TRYING TO ACQUIRE DISK?
003152' 001004                          BNE     20$                     ;N,Y-20$
003154' 004567  004532                  JSR     R5,ERRCS1               ;ISSUE I/O TIMEOUT ERROR MSG
003160' 003315                          .WORD   IOTO-ERMBAS
003162' 000406                          BR      30$                     ;GO TO EXIT
003164' 052767  000040  174610  20$:    BIS     #SWOVTO,DFLGWD          ;SET SWITCH OVER T/O ERROR FLAG
003172' 004567  004514                  JSR     R5,ERRCS1               ;ISSUE T/O ON DISK ACQUIRE ERR MSG
003176' 003334                          .WORD   ACQTO-ERMBAS
003200' 004067  006150          30$:    JSR     R0,RESREG               ;RESTORE REGISTERS
003204' 012605                          MOV     (SP)+,R5                ;REMOVE RETURN ADR
003206' 000177  174636                  JMP     @CUPGER                 ;GO TO ERROR EXIT

003212' 032777  000002  174644  CKUNLD: BIT     #USMTPS,@CSYSFW         ;NEED TO USE MTPS INST?
003220' 001007                          BNE     32$                     ;N,Y-32$
003222' 113767  177776  177140          MOVB    @#PS,CURPSW             ;SAVE CURRENT PRIORITY
003230' 152737  000340  177776          BISB    #340,@#PS               ;SET PRIORITY TO 7
003236' 000404                          BR      34$                     ;GO SET UP UNIT #
003240' 106767  177124          32$:    MFPS    CURPSW                  ;SAVE CURR PRIORITY
003244' 106427  000340                  MTPS    #340                    ;SET PRIORITY TO 7
003250' 016400  000010          34$:    MOV     RPCS2(R4),R0            ;GET CURR UNIT #
003254' 010001                          MOV     R0,R1                   ;SAVE IT
003256' 042700  177747                  BIC     #177747,R0              ;RESET UNIT # & OTHER BITS
003262' 156300  000035                  BISB    PCURDV(R3),R0           ;SET IN MY UNIT #
```

```
                                MOVB    RO,RPCS2(R4)            ;MOVE UNIT # TO RH11
                                TST     (R4)                    ;SELECT MY DRIVE
                                MOV     RPDS(R4),RO             ;GET DRIVE'S STATUS
                                COM     RO                      ;FLIP THE BITS
                                BIT     #10200,RO               ;WERE MOL & DRY BOTH SET?
                                BNE     40$                     ;Y,N-40$
                                BIC     #WT4IOT,(R3)            ;RESET WAITING FOR I/O TERM FLAG
                                BIC     #UNLDIP,DFLGWD          ;RESET UNLOAD IN PROGRESS FLAG
                                MOV     #3000.,PTOCNT(R3)       ;RESTORE 1 SECOND T/O COUNT
                                MOVB    R1,RPCS2(R4)            ;RESTORE ORIG UNIT #
                                TST     (R4)                    ;RESELECT ORIG DRIVE
                                BIT     #USMTPS,@CSYSFW         ;NEED TO USE MTPS INST?
                                BNE     50$                     ;N,Y-50$
                                MOVB    CURPSW,@#PS             ;RESTORE ORIG PRIORITY
                                BR      60$                     ;GO TO EXIT
                        50$:    MTPS    CURPSW                  ;RESTORE ORIG PRIORITY
                        60$:    JSR     R0,RESREG               ;RESTORE REGISTERS
                                RTS     R5                      ;RETURN IN-LINE


                                ;KILL USER PROGRAM ROUTINE

                                        ;JSR    R5,KILL         S/R CALL
                                        ;R3 MUST CONTAIN PROG TBL ADR
                                        ;DESTROYS R0,R1

                        KILL:   MOV     DREGAD,R1               ;GET DEV REG ADR
                                JSR     R5,TVECT                ;DO I HAVE VECTOR CONTROL?
                                BR      KILLEX                  ;BR IF I DON'T
                                BITB    #100,(R1)               ;IS INT ENABLE SET?
                                BEQ     10$                     ;Y,N-10$
                                BICB    #100,(R1)               ;RESET INT ENABLE
                        10$:    JSR     PC,RINTV                ;RESET INT VECTOR INFO
                        KILLEX: RTS     R5                      ;EXIT IN-LINE
```

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                                        .SBTTL  RP04/RP05/RP06 NON-I/O FUNCTION ROUTINES


                                        ;"STEPUP" FUNCTION ROUTINE

                                                ;JSR     R5,STEPUP       FUNCTION CALL
                                                ;.WORD   NBR             INCREMENT FACTOR

003422' 004767  000060          STEPUP: JSR     PC,STPCOM               ;DO COMMON SETUP
003426' 062502                          ADD     (R5)+,R2                ;ADD INCR VALUE TO SECT #
003430' 020203                  10$:    CMP     R2,R3                   ;SECT # IN RANGE?
003432' 103403                          BLO     15$                     ;N,Y-15$
003434' 160302                          SUB     R3,R2                   ;ADJ SECT # DOWNWARDS
003436' 005201                          INC     R1                      ;ADD 1 TO HEAD #
003440' 000773                          BR      10$                     ;GO CK NEW SECT # VALUE
003442' 020127  000023          15$:    CMP     R1,#19.                 ;HEAD # IN RANGE?
003446' 103404                          BLO     20$                     ;N,Y-20$
003450' 162701  000023                  SUB     #19.,R1                 ;ADJ HEAD # DOWNWARDS
003454' 005200                          INC     R0                      ;ADD 1 TO CYL #
003456' 000771                          BR      15$                     ;GO CHECK NEW HEAD #
003460' 020004                  20$:    CMP     R0,R4                   ;CYL # IN RANGE?
003462' 103402                          BLO     STEPEX                  ;N,Y-STEPEX
003464' 160400                          SUB     R4,R0                   ;ADJ CYL # DOWNWARDS
003466' 000774                          BR      20$                     ;GO CK IT NOW
003470' 010067  174310          STEPEX: MOV     R0,CYL                  ;STORE NEW CYL,HEAD,SECT VALUES
003474' 010167  174306                  MOV     R1,HEAD
003500' 010267  174304                  MOV     R2,SECT
003504' 000205                          RTS     R5                      ;EXIT TO USER PROG


003506' 016700  174272          STPCOM: MOV     CYL,R0                  ;GET CYL, HEAD, & SECT VALUES
003512' 016701  174270                  MOV     HEAD,R1                 ;IN REGISTERS
003516' 016702  174266                  MOV     SECT,R2
003522' 004767  005644                  JSR     PC,SUPTAD               ;GET PROG TBL ADR IN R3
003526' 012704  000633                  MOV     #411.,R4                ;PRESET # OF CYL'S TO RP04/RP05
003532' 032763  000040  000032          BIT     #40,PMDLCD(R3)          ;THIS AN RP06?
003540' 001402                          BEQ     STPC10                  ;Y,N-STPC10
003542' 012704  001457                  MOV     #815.,R4                ;SET UP # OF RP06 CYL'S
003546' 012703  000026          STPC10: MOV     #22.,R3                 ;PRESET TO # OF 16 BIT WD SECTORS
003552' 032767  010000  176616          BIT     #FMT22B,RPOFV           ;USING 16 BIT WORD FORMAT?
003560' 001002                          BNE     STPCEX                  ;N,Y-STPCEX
003562' 012703  000024                  MOV     #20.,R3                 ;SET UP # OF 18 BIT WD SECTORS
003566' 000207                  STPCEX: RTS     PC                      ;EXIT IN-LINE


                                        ;"STEPDN" FUNCTION ROUTINE

                                                ;JSR     R5,STEPDN       FUNCTION CALL
                                                ;.WORD   NBR             DECREMENT FACTOR

003570' 004767  177712          STEPDN: JSR     PC,STPCOM               ;DO COMMON SETUP
003574' 162502                          SUB     (R5)+,R2                ;SUB DECR FACTOR FROM SECT #
003576' 020203                  40$:    CMP     R2,R3                   ;SECT # IN RANGE?
003600' 103403                          BLO     45$                     ;N,Y-45$
003602' 060302                          ADD     R3,R2                   ;ADJ SECT # UPWARDS
003604' 005301                          DEC     R1                      ;DECR HEAD # BY 1
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003606' 000773                          BR      40$                     ;GO CK NEW SECT # VALUE
003610' 020127  000023          45$:    CMP     R1,#19.                 ;HEAD # IN RANGE?
003614' 103404                          BLO     5C$                     ;N,Y-50$
003616' 062701  000023                  ADD     #19.,R1                 ;ADJ IT UPWARDS
003622' 005300                          DEC     R0                      ;DECR CYL # BY 1
003624' 000771                          BR      45$                     ;GO CHECK NEW HEAD #
003626' 020004                  50$:    CMP     R0,R4                   ;CYL # IN RANGE?
003630' 103717                          BLO     STEPEX                  ;N,Y-STEPEX
003632' 060400                          ADD     R4,R0                   ;ADJ IT UPWARDS
003634' 000774                          BR      50$                     ;GO CK IT NOW


                                        ;"WAIT" FUNCTION ROUTINE

                                                ;JSR    R5,WAIT         FUNCTION CALL

003636' 042767  100000  174136  WAIT:   BIC     #WAITMD,DFLGWD          ;RESET THE "NOWAIT" FLAG
003644' 004767  003464                  JSR     PC,CKDBSY               ;WAIT IF BUSY & DO TERMINATION
003650' 004767  003754                  JSR     PC,RINTV                ;RESET THE INTERRUPT VECTOR
003654' 000205                          RTS     R5                      ;EXIT IN-LINE


                                        ;"NOWAIT" FUNCTION ROUTINE

                                                ;JSR    R5,NOWAIT       FUNCTION CALL

003656' 052767  100000  174116  NOWAIT: BIS     #WAITMD,DFLGWD          ;SET THE "NOWAIT" FLAG
003664' 000205                          RTS     R5                      ;EXIT IN-LINE


                                        ;"APORT" FUNCTION ROUTINE

                                                ;JSR    R5,APORT        FUNCTION CALL

003666' 042767  002000  176476  APORT:  BIC     #PORT,RPCS1V            ;RESET THE PORT BIT
003674' 000205                          RTS     R5                      ;EXIT IN-LINE


                                        ;"BPORT" FUNCTION ROUTINE

                                                ;JSR    R5,BPORT        FUNCTION CALL

003676' 052767  002000  176466  BPORT:  BIS     #PORT,RPCS1V            ;SET THE PORT BIT TO B PORT
003704' 000205                          RTS     R5                      ;EXIT IN-LINE


                                        ;"ODD" FUNCTION ROUTINE

                                                ;JSR    R5,ODD          FUNCTION CALL

003706' 042767  000020  176460  ODD:    BIC     #PARITY,RPCS2V          ;RESET THE PARITY BIT
003714' 000205                          RTS     R5                      ;EXIT IN-LINE
```

```
                                        ;"EVEN" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,EVEN         FUNCTION CALL
                                        ;
003716' 052767  000020  176450  EVEN:   BIS     #PARITY,RPCS2V          ;SET THE PARITY BIT FOR EVEN
003724' 000205                          RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"ECION" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,ECION        FUNCTION CALL
                                        ;
003726' 052767  004000  176442  ECION:  BIS     #ECI,RPOFV              ;SET THE ECI BIT
003734' 000205                          RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"ECIOFF" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,ECIOFF       FUNCTION CALL
                                        ;
003736' 042767  004000  176432  ECIOFF: BIC     #ECI,RPOFV              ;RESET THE ECI BIT
003744' 000205                          RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"HCION" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,HCION        FUNCTION CALL
                                        ;
003746' 052767  002000  176422  HCION:  BIS     #HCI,RPOFV              ;SET THE HCI BIT
003754' 000205                          RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"HCIOFF" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,HCIOFF       FUNCTION CALL
                                        ;
003756' 042767  002000  176412  HCIOFF: BIC     #HCI,RPOFV              ;RESET THE HCI BIT
003764' 000205                          RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"BAION" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,BAION        FUNCTION CALL
                                        ;
003766' 052767  000010  176400  BAION:  BIS     #BAI,RPCS2V             ;SET THE BAI BIT
003774' 000205                          RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"BAIOFF" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,BAIOFF       FUNCTION CALL
                                        ;
003776' 042767  000010  176370  BAIOFF: BIC     #BAI,RPCS2V             ;RESET THE BAI BIT
004004' 000205                          RTS     R5                      ;EXIT IN-LINE
```

```
                                        ;"CORON" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,CORON        FUNCTION CALL
                                        ;
004006' 042767  002000  173766  CORON: BIC     #CORFLG,DFLGWD          ;RESET THE COR INH FLAG
004014' 000205                  RTS     R5                              ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"COROFF" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,COROFF       FUNCTION CALL
                                        ;
004016' 052767  002000  173756  COROFF: BIS     #CORFLG,DFLGWD          ;SET THE COR INH FLAG
004024' 000205                  RTS     R5                              ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"VVON" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,VVON         FUNCTION CALL
                                        ;
004026' 042767  001000  173746  VVON:   BIC     #VVFLG,DFLGWD           ;RESET THE VV INH FLAG
004034' 000205                  RTS     R5                              ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"VVOFF" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,VVOFF        FUNCTION CALL
                                        ;
004036' 052767  001000  173736  VVOFF:  BIS     #VVFLG,DFLGWD           ;SET THE VV INH FLAG
004044' 000205                  RTS     R5                              ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"FMT22" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,FMT22        FUNCTION CALL
                                        ;
004046' 052767  010000  176322  FMT22:  BIS     #FMT22B,RPOFV           ;SET THE FORMAT 22 BIT
004054' 000205                  RTS     R5                              ;EXIT IN-LINE
                                        ;
                                        ;
                                        ;"FMT20" FUNCTION ROUTINE
                                        ;
                                                ;JSR     R5,FMT20        FUNCTION CALL
                                        ;
004056' 042767  010000  176312  FMT20:  BIC     #FMT22B,RPOFV           ;RESET THE FORMAT 22 BIT
004064' 000205                  RTS     R5                              ;EXIT IN-LINE
```

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                                        .SBTTL  RP04/RP05/RP06 NON-INTERRUPT TYPE I/O FUNCTION ROUTINES


                                        ;"CRESET" FUNCTION ROUTINE

                                                ;JSR    R5,CRESET       FUNCTION CALL

004066' 004767  003242          CRESET: JSR     PC,CKDBSY               ;GO CK IF DEV IS BUSY
004072' 005267  176212                  INC     MISCNT                  ;ADD 1 TO MISC. CMND CNT
004076' 005067  173720                  CLR     ERRI                    ;RESET THE ERROR INDICATOR
004102' 005000                          CLR     R0                      ;INITIALIZE TIME OUT COUNT
004104' 052764  000040  000010          BIS     #40,RPCS2(R4)           ;SET THE CLR BIT IN RPCS2
004112' 105714                  10$:    TSTB    (R4)                    ;READY SET YET?
004114' 100407                          BMI     20$                     ;N,Y-20$
004116' 005300                          DEC     R0                      ;TIMED OUT?
004120' 100774                          BMI     10$                     ;Y,N-10$
004122' 004567  003556                  JSR     R5,ERRCS                ;GO ISSUE CRESET TIMEOUT ERROR
004126' 003277                          .WORD   CRTO-ERMBAS
004130' 000177  173714                  JMP     @CUPGER                 ;GO TO ERR RET POINT IN MPG
004134' 000205                  20$:    RTS     R5                      ;EXIT IN-LINE TO USER'S PROG


                                        ;"DRESET" FUNCTION ROUTINE

                                                ;JSR    R5,DRESET       FUNCTION CALL

004136' 012702  000011          DRESET: MOV     #011,R2                 ;SET UP DRESET CMND CODE
004142' 000414                          BR      NOICOM                  ;GO TO NO INT CMND COM PROCESSING


                                        ;"UNLOAD" FUNCTION ROUTINE

                                                ;JSR    R5,UNLOAD       FUNCTION CALL

004144' 012702  000003          UNLOAD: MOV     #003,R2                 ;SET UP UNLOAD CMND CODE
004150' 000411                          BR      NOICOM                  ;GO TO NO INT CMND COM PROCESSING


                                        ;"PAKACK" FUNCTION ROUTINE

                                                ;JSR    R5,PAKACK       FUNCTION CALL

004152' 012702  000023          PAKACK: MOV     #023,R2                 ;SET UP PACK ACKNOWLEDGE CMND CODE
004156' 000406                          BR      NOICOM                  ;GO TO NO INT CMND COM PROCESSING


                                        ;"RDPSET" FUNCTION ROUTINE

                                                ;JSR    R5,RDPSET       FUNCTION CALL

004160' 012702  000021          RDPSET: MOV     #021,R2                 ;SET UP READ IN PRESET CMND CODE
004164' 000403                          BR      NOICOM                  ;GO TO NO INT CMND COM PROCESSING
```

```
                                        ;"REL" FUNCTION ROUTINE
                                                ;JSR    R5,REL          FUNCTION CALL
004166' 012702  000013          REL:    MOV     #013,R2                 ;SET UP RELEASE CMND CODE
004172' 000400                  BR      NOICOM                          ;GO TO NO INT CMND COM PROCESSING

                                        ;NON INTERRUPT I/O FUNCTION COMMON PROCESSING
                                                ;R5 = USER PROGRAM RETURN ADR
                                                ;R4 = RPCS1 ADR
                                                ;R3 = PROG TBL ADR
                                                ;R2 = FUNCTION'S COMMAND CODE
004174' 004767  003134          NOICOM: JSR     PC,CKDBSY               ;GO CK IF DEV IS BUSY
004200' 005267  176104                  INC     MISCNT                  ;ADD 1 TO MISC. CMND CNT
004204' 004767  000202                  JSR     PC,ACQHSK               ;ACQUIRE & HOUSEKEEP THE DISK
004210' 016764  176162  000032          MOV     RPOFV,RPOF(R4)          ;SET UP BITS IN RPOF
004216' 020227  000003                  CMP     R2,#003                 ;UNLOAD CMND?
004222' 001403                          BEQ     10$                     ;N,Y-10$
004224' 020227  000013                  CMP     R2,#013                 ;RELEASE CMND?
004230' 001012                          BNE     20$                     ;Y,N-20$
004232' 032767  001000  173542  10$:    BIT     #VVFLG,DFLGWD           ;VVON STATEMENT IN EFFECT?
004240' 001006                          BNE     20$                     ;Y,N-20$
004242' 032764  000100  000012          BIT     #VV,RPDS(R4)            ;IS THE VV BIT SET?
004250' 001002                          BNE     20$                     ;N,Y-20$
004252' 112714  000023                  MOVB    #023,(R4)               ;ISSUE THE PACK ACKNOWLEDGE CMND
004256' 056702  176110          20$:    BIS     RPCS1V,R2               ;SET PORT SELECT BIT INTO CMND WORD
004262' 052767  000300  173E_2          BIS     #CMDISU+ANYIOI,DFLGWD   ;SET CMND ISSUED FLAGS
004270' 010214                          MOV     R2,(R4)                 ;ISSUE SPECIFIED CMND
004272' 012700  000012                  MOV     #10.,R0                 ;SET UP DELAY CNT
004276' 005300                  30$:    DEC     R0                      ;DELAY FOR A FEW MICROSECONDS
004300' 001376                          BNE     30$
004302' 005714                          TST     (R4)                    ;IS 'SC' ERROR BIT SET?
004304' 100021                          BPL     50$                     ;Y,N-50$
004306' 032714  060000                  BIT     #TRE+MCPE,(R4)          ;TRE OR MCPE ERR BITS SET?
004312' 001011                          BNE     40$                     ;N,Y-40$
004314' 032764  040000  000012          BIT     #ERR,RPDS(R4)           ;ERROR SUMMARY BIT SET?
004322' 001005                          BNE     40$                     ;N,Y-40$
004324' 016400  000016                  MOV     RPAS(R4),R0             ;GET ATA SUMMARY REG
004330' 036700  000622                  BIT     MYATA,R0                ;IS IT MY ATA LINE?
004334' 001405                          BEQ     50$                     ;Y,N-50$
004336' 004567  003342          40$:    JSR     R5,ERRCS                ;REPORT NON-INT TERM ERROR
004342' 003473                          .WORD   NOITER-ERMBAS
004344' 000177  173500                  JMP     @CUPGER                 ;GO TO MPG'S ERROR RETURN POINT
004350' 120227  000003          50$:    CMPB    R2,#003                 ;IS THIS THE UNLOAD CMND?
004354' 001015                          BNE     60$                     ;Y,N-60$
004356' 012763  005670  000030          MOV     #3000.,PTOCNT(R3)       ;INITIALIZE 1 SECOND T/O CNT
004364' 052767  000004  173410          BIS     #UNLDIP,DFLGWD          ;SET UNLOAD IN PROGRESS FLAG
004372' 005767  173404                  TST     DFLGWD                  ;"NOWAIT" FLAG SET?
004376' 100404                          BMI     60$                     ;N,Y-60$
004400' 052713  000010                  BIS     #WT4IOT,(R3)            ;SET WAITING FOR I/O TERM FLAG
004404' 004577  173436                  JSR     R5,@CIOBSY              ;RELEASE CNTRL UNTIL UNIT IS ON-LINE
004410' 000205                  60$:    RTS     R5                      ;EXIT TO USER PROG
```

```
                                        ;ACQUIRE DISK AND HOUSEKEEP IT
                                        ;
                                        ;JSR    PC,ACQHSK       S/R CALL
                                        ;
                                        ;R5 = ADR AFTER USER PROG JSR
                                        ;R4 = RPCS1 ADR
                                        ;R3 = PROG TBL ADR
                                        ;
                                        ;DESTROYS R0
                                        ;
004412' 010146          ACQHSK: MOV     R1,-(SP)                ;SAVE R1
004414' 005063  000030  ACQRTY: CLR     PTOCNT(R3)              ;SET T/O CNT TO MAX VALUE
004420' 042767  000174  173354  BIC     #SWOVER+SWOIER+SWOVTO+UNLDIP+CMDISU,DFLGWD ;HSKP FLAG BITS
004426' 116300  000035          MOVB    PCURDV(R3),R0           ;GET MY UNIT #
004432' 020027  000007          CMP     R0,#7                   ;VALID UNIT #?
004436' 101411                  BLOS    10$                     ;N,Y-10$
004440' 012767  003663  000446  MOV     #INVDVN-ERMBAS,ACQEAD   ;SET UP ADR OF INV UNIT # ERR MSG
004446' 005267  175644          INC     DATAER                  ;ADJ ERROR COUNTS
004452' 005367  175634          DEC     ERRCNT
004456' 000167  000422          JMP     ACQERR                  ;GO REPORT THE ERROR
004462' 010001          10$:    MOV     R0,R1                   ;GET DISPLACEMENT INTO
004464' 006301                  ASL     R1                      ;THE ATA TABLE FOR
004466' 060701                  ADD     PC,R1                   ;THIS UNIT #
004470' 062701  000446          ADD     #ATATBL-.,R1
004474' 112167  000456          MOVB    (R1)+,MYATA             ;STORE ATA BIT MASKS FOR
004500' 111167  000454          MOVB    (R1),OTHATA             ;THIS UNIT #
004504' 056700  175664          BIS     RPCS2V,R0               ;SET PAT & BAI BITS IN UNIT #
004510' 005001                  CLR     R1                      ;HSKP 1ST TIME FLAG
004512' 010064  000010  12$:    MOV     R0,RPCS2(R4)            ;MOVE UNIT # TO RH11
004516' 005714                  TST     (R4)                    ;SELECT THE DRIVE
004520' 032764  010000  000010  BIT     #NED,RPCS2(R4)          ;NON-EXISTENT DRIVE?
004526' 001413                  BEQ     20$                     ;Y,N-20$
004530' 005701                  TST     R1                      ;FIRST TIME?
004532' 001005                  BNE     16$                     ;Y,N-16$
004534' 005201                  INC     R1                      ;RESET FIRST TIME
004536' 112764  000100  000001  MOVB    #100,1(R4)              ;DO RH11 ERROR CLEAR
004544' 000762                  BR      12$                     ;GO LOAD UNIT # AGAIN
004546' 012767  003360  000340  16$:    MOV     #NONEXD-ERMBAS,ACQEAD   ;SET UP ADR OF NON-EXIST DRIVE ERR MSG
004554' 000553                  BR      ACQERR                  ;GO REPORT THE ERROR
004556' 005064  000012  20$:    CLR     RPDS(R4)                ;WRITE TO A DRIVE REG
004562' 032714  004000          BIT     #DVA,(R4)               ;DRIVE AVAILABLE SET?
004566' 001035                  BNE     GOTDSK                  ;N,Y-GOTDSK
004570' 112764  000100  000001  MOVB    #100,1(R4)              ;HSKP ANY RH11 ERRORS
004576' 052713  000010          BIS     #WT4IOT,(R3)            ;SET WAITING FOR I/O TERM FLAG
004602' 052767  000010  173172  BIS     #SWOVER,DFLGWD          ;SET WAITING FOR SWITCH OVER FLAG
004610' 112714  000101          MOVB    #101,(R4)               ;ISSUE NOP & SET INT ENABLE
004614' 004577  173226          JSR     R5,@CIOBSY              ;RELEASE CONTROL UNTIL DISK IS SEIZED
004620' 032767  000020  173154  BIT     #SWOIER,DFLGWD          ;ERROR IN INT DURING SWITCH OVER?
004626' 001007                  BNE     30$                     ;N,Y-30$
004630' 032767  000040  173144  BIT     #SWOVTO,DFLGWD          ;TIME OUT ERROR ON SWITCH OVER?
004636' 001133                  BNE     ACQGDK                  ;N,Y-ACQGDK
004640' 112714  000001          MOVB    #1,(R4)                 ;RESET INT ENABLE
004644' 000744                  BR      20$                     ;GO MAKE SURE WE STILL HAVE IT
004646' 010146          30$:    MOV     R1,-(SP)                ;SAVE R1 & R2
004650' 010246                  MOV     R2,-(SP)
004652' 004567  003052          JSR     R5,ERRIS                ;REPORT INT'S ERROR MSG
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1182  004656' 003531                ACQIAD: .WORD   NOATA-ERMBAS
1183  004660' 000516                        BR      ACQERC          ;GO TO COMMON ERROR RETURN
1184  004662' 042767 000030 173112 GOTDSK: BIC     #SWOVER+SWOIER,DFLGWD ;RESET SWITCH OVER FLAGS
1185  004670' 005063 000030                CLR     PTOCNT(R3)      ;HSKP T/O CNT
1186  004674' 032764 010000 000012        BIT     #MOL,RPDS(R4)   ;DISK ON-LINE?
1187  004702' 001004                       BNE     40$             ;N,Y-40$
1188  004704' 012767 003436 000202        MOV     #OFFLIN-ERMBAS,ACQEAD ;SET UP ADR OF DISK OFFLINE ERR MSG
1189  004712' 000474                       BR      ACQERR          ;GO REPORT THE ERROR
1190  004714' 005001                40$:    CLR     R1              ;RESET ERROR LOOP CNT
1191  004716' 005714                50$:    TST     (R4)            ;IS 'SC' ERROR BIT SET?
1192  004720' 100062                       BPL     100$            ;Y,N-100$
1193  004722' 032764 040000 000014        BIT     #UNS,RPER1(R4)  ;IS THERE AN UNSAFE ERROR?
1194  004730' 001033                       BNE     80$             ;N,Y-80$
1195  004732' 020127 000005                CMP     R1,#5           ;5TH TIME THRU ON THIS ERROR?
1196  004736' 001004                       BNE     60$             ;Y,N-60$
1197  004740' 012767 003412 000146        MOV     #INITDE-ERMBAS,ACQEAD ;SET UP ADR OF INITIATION ERR MSG
1198  004746' 000456                       BR      ACQERR          ;GO REPORT THE ERROR
1199  004750' 005201                60$:    INC     R1              ;ADD 1 TO ERROR LOOP CNT
1200  004752' 016400 000016                MOV     RPAS(R4),R0     ;GET ATA REG
1201  004756' 105700                       TSTB    R0              ;IS THERE AN ATTENTION?
1202  004760' 001432                       BEQ     90$             ;Y,N-90$
1203  004762' 036700 000172                BIT     OTHATA,R0       ;MY ATA ONLY?
1204  004766' 001427                       BEQ     90$             ;N,Y-90$
1205  004770' 036700 000162                BIT     MYATA,R0        ;MY ATA LINE ALSO?
1206  004774' 001006                       BNE     70$             ;N,Y-70$
1207  004776' 010064 000016                MOV     R0,RPAS(R4)     ;RESET OTHER ATA LINES
1208  005002' 112764 000100 000001        MOVB    #100,1(R4)      ;DO RH11 ERROR CLEAR
1209  005010' 000742                       BR      50$             ;GO CK 'SC' AGAIN
1210  005012' 010064 000016        70$:    MOV     R0,RPAS(R4)     ;RESET OTHER ATA LINES
1211  005016' 000413                       BR      90$             ;GO CLEAR MY DRIVE
1212  005020' 005767 172776        80$:    TST     ERRI            ;ERROR ON PREVIOUS I/O?
1213  005024' 001010                       BNE     90$             ;N,Y-90$
1214  005026' 032767 0002 ) 172746        BIT     #ANYIOI,DFLGWD  ;ANY I/O CMNDS BEEN ISSUED?
1215  005034' 001404                       BEQ     90$             ;Y,N-90$
1216  005036' 012767 003403 000050        MOV     #INITUS-ERMBAS,ACQEAD ;SET UP ADR OF UNSAFE ERROR MSG
1217  005044' 000417                       BR      ACQERR          ;GO REPORT THE ERROR
1218  005046' 005067 172750        90$:    CLR     ERRI            ;RESET PREV I/O ERR FLAG
1219  005052' 052767 000200 172722        BIS     #ANYIOI,DFLGWD  ;SET FLAG TO PREVENT LOOP
1220  005060' 012714 040011                MOV     #TRE+011,(R4)   ;DO RH11 & DRIVE CLEAR
1221  005064' 000714                       BR      50$             ;GO CK 'SC' AGAIN
1222  005066' 005067 172730        100$:   CLR     ERRI            ;HSKP ERROR INDICATOR
1223  005072' 042767 000001 172702        BIC     #IOERR,DFLGWD   ; & FLAGS
1224  005100' 012601                       MOV     (SP)+,R1        ;RESTORE R1
1225  005102' 000207                       RTS     PC              ;EXIT IN-LINE
1226
1227  005104' 010146                ACQERR: MOV     R1,-(SP)        ;SAVE R1 & R2
1228  005106' 010246                        MOV     R2,-(SP)
1229  005110' 004567 002570                JSR     R5,ERRCS        ;STORE CURR STATUS & REPORT
1230  005114' 003412                ACQEAD: .WORD   INITDE-ERMBAS   ;THE ERROR
1231  005116' 012602                ACQERC: MOV     (SP)+,R2        ;RESTORE R1 & R2
1232  005120' 012601                        MOV     (SP)+,R1
1233  005122' 004577 172722                JSR     R5,@CUPGER      ;GO TO MPG'S ERROR RETURN POINT
1234  005126' 004767 002202        ACQGDK: JSR     PC,CKDBSY       ;GO CK IF DEV IS BUSY NOW
1235  005132' 000167 177256                JMP     ACQRTY          ;GO TRY AGAIN
1236
1237
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1238  005136'  001  376        ATATBL: .BYTE   001,376
1239  005140'  002  375                .BYTE   002,375
1240  005142'  004  373                .BYTE   004,373
1241  005144'  010  367                .BYTE   010,367
1242  005146'  020  357                .BYTE   020,357
1243  005150'  040  337                .BYTE   040,337
1244  005152'  100  277                .BYTE   100,277
1245  005154'  200  177                .BYTE   200,177
1246
1247  005156'  000000           MYATA:  .WORD   0
1248  005160'  000000           OTHATA: .WORD   0
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                                        .SBTTL  RP04/RP05/RP06 INTERRUPT TYPE I/O FUNCTION ROUTINES


                                        ;"READ" FUNCTION ROUTINE

                                                ;JSR     R5,READ         FUNCTION CALL
                                                ;.WORD   ADR             DATA ADDRESS (BITS 16 - 21)
                                                ;.WORD   ADR             DATA ADDRESS (BITS 0 - 15)
                                                ;.WORD   CNT             BYTE COUNT
                                                ;.WORD   DEV             (NOT USED)

005162' 012702  000171          READ:   MOV     #171,R2                 ;SET UP READ DATA CMND CODE
005166' 012701  000635                  MOV     #635,R1                 ;SET UP CMND FLAG WORD
005172' 004767  002136          RDCOM:  JSR     PC,CKDBSY               ;GO CK IF DEV IS BUSY
005176' 005267  175076                  INC     RDCNT                   ;ADD 1 TO READ CMND CNT
005202' 010700                          MOV     PC,R0                   ;SET UP ADR OF BYTES READ CNT
005204' 062700  175062                  ADD     #BYRD+2-.,R0
005210' 000502                          BR      CMDCOM                  ;GO TO CMND COMMON PROCESSING


                                        ;"WRITE" FUNCTION ROUTINE

                                                ;JSR     R5,WRITE        FUNCTION CALL
                                                ;.WORD   ADR             DATA ADDRESS (BITS 16 - 21)
                                                ;.WORD   ADR             DATA ADDRESS (BITS 0 - 15)
                                                ;.WORD   CNT             BYTE COUNT
                                                ;.WORD   DEV             (NOT USED)

005212' 012702  000161          WRITE:  MOV     #161,R2                 ;SET UP WRITE DATA CMND CODE
005216' 012701  000235                  MOV     #235,R1                 ;SET UP CMND FLAG WORD
005222' 004767  002106          WRCOM:  JSR     PC,CKDBSY               ;GO CK IF DEV IS BUSY
005226' 005267  175050                  INC     WRCNT                   ;ADD 1 TO WRITE CMND CNT
005232' 010700                          MOV     PC,R0                   ;SET UP ADR OF BYTES WRITTEN CNT
005234' 062700  175036                  ADD     #BYWR+2-.,R0
005240' 000466                          BR      CMDCOM                  ;GO TO CMND COMMON PROCESSING


                                        ;"RDHD" FUNCTION ROUTINE

                                                ;JSR     R5,RDHD         FUNCTION CALL
                                                ;.WORD   ADR             DATA ADDRESS (BITS 16 - 21)
                                                ;.WORD   ADR             DATA ADDRESS (BITS 0 - 15)
                                                ;.WORD   CNT             BYTE COUNT

005242' 012702  000173          RDHD:   MOV     #173,R2                 ;SET UP RDHD CMND CODE
005246' 012701  001636                  MOV     #1636,R1                ;SET UP CMND FLAG WORD
005252' 000747                          BR      RDCOM                   ;GO TO COMMON READ PROCESSING
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                                        ;"WRHD" FUNCTION ROUTINE

                                                ;JSR     R5,WRHD         FUNCTION CALL
                                                ;.WORD   ADR             DATA ADDRESS (BITS 16 - 21)
                                                ;.WORD   ADR             DATA ADDRESS (BITS 0 - 15)
                                                ;.WORD   CNT             BYTE COUNT

005254' 012702  000163          WRHD:   MOV     #163,R2                 ;SET UP WRHD CMND CODE
005260' 012701  000236                  MOV     #236,R1                 ;SET UP CMND FLAG WORD
005264' 000756                          BR      WRCOM                   ;GO TO WRITE COMMON PROCESSING


                                        ;"WRCK" FUNCTION ROUTINE

                                                ;JSR     R5,WRCK         FUNCTION CALL
                                                ;.WORD   ADR             DATA ADDRESS (BITS 16 - 21)
                                                ;.WORD   ADR             DATA ADDRESS (BITS 0 - 15)
                                                ;.WORD   CNT             BYTE COUNT

005266' 012702  000151          WRCK:   MOV     #151,R2                 ;SET UP WRCK CMND CODE
005272' 012701  000236          CKCOM:  MOV     #236,R1                 ;SET UP CMND FLAG WORD
005276' 004767  002032                  JSR     PC,CKDBSY               ;GO CK IF DEV IS BUSY
005302' 005267  174776                  INC     CKCNT                   ;ADD 1 TO CHECK CMND COUNT
005306' 010700                          MOV     PC,R0                   ;SET UP ADR OF BYTES
005310' 062700  174766                  ADD     #BYCK+2-.,R0            ;CHECKED COUNT
005314' 000440                          BR      CMDCOM                  ;GO TO CMND COM PROCESSING


                                        ;"WRCKHD" FUNCTION ROUTINE

                                                ;JSR     R5,WRCKHD       FUNCTION CALL
                                                ;.WORD   ADR             DATA ADDRESS (BITS 16 - 21)
                                                ;.WORD   ADR             DATA ADDRESS (BITS 0 - 15)
                                                ;.WORD   CNT             BYTE COUNT

005316' 012702  000153          WRCKHD: MOV     #153,R2                 ;SET UP WRCKHD CMND CODE
005322' 000763                          BR      CKCOM                   ;GO TO CHECK CMND COM PROCESSING


                                        ;"SEEK" FUNCTION ROUTINE

                                                ;JSR     R5,SEEK         FUNCTION CALL

005324' 012702  000105          SEEK:   MOV     #105,R2                 ;SET UP SEEK CMND CODE
005330' 012701  000060                  MOV     #060,R1                 ;SET UP CMND FLAG WORD
005334' 004767  001774          SKCOM:  JSR     PC,CKDBSY               ;GO CK IF DEV IS BUSY
005340' 005267  174742                  INC     SKCNT                   ;ADD 1 TO SEEK CMND COUNT
005344' 000424                          BR      CMDCOM                  ;GO TO CMND COMMON PROCESSING
```

```
                                        ;"SEARCH" FUNCTION ROUTINE
                                        ;
                                                ;JSR    R5,SEARCH       FUNCTION CALL
                                        ;
005346' 012702  000131          SEARCH: MOV     #131,R2                 ;SET UP SRCH CMND CODE
005352' 012701  000060                  MOV     #060,R1                 ;SET UP CMND FLAG WORD
005356' 000766                          BR      SKCOM                   ;GO TO SEEK CMND COM PROCESSING
                                        ;
                                        ;"OFFSET" FUNCTION ROUTINE
                                        ;
                                                ;JSR    R5,OFFSET       FUNCTION CALL
                                                ;.WORD  VALUE           BINARY OFFSET VALUE
                                        ;
005360' 012702  000115          OFFSET: MOV     #115,R2                 ;SET UP OFFSET CMND CODE
005364' 012701  000140                  MOV     #140,R1                 ;SET UP CMND FLAG WORD
005370' 000761                          BR      SKCOM                   ;GO TO SEEK CMND COM PROCESSING
                                        ;
                                        ;"RETCTR" FUNCTION ROUTINE
                                        ;
                                                ;JSR    R5,RETCTR       FUNCTION CALL
                                        ;
005372' 012702  000117          RETCTR: MOV     #117,R2                 ;SET UP RETURN TO CENTERLINE CMND CODE
005376' 012701  000040                  MOV     #040,R1                 ;SET UP CMND FLAG WORD
005402' 000754                          BR      SKCOM                   ;GO TO SEEK CMND COM PROCESSING
                                        ;
                                        ;"RECAL" FUNCTION ROUTINE
                                        ;
                                                ;JSR    R5,RECAL        FUNCTION CALL
                                        ;
005404' 012702  000107          RECAL:  MOV     #107,R2                 ;SET UP RECALIBRATE CMND CODE
005410' 012701  000040                  MOV     #040,R1                 ;SET UP CMND FLAG WORD
005414' 000747                          BR      SKCOM                   ;GO TO SEEK CMND COM PROCESSING
```

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                                        ;INTERRUPT TYPE I/O FUNCTION COMMON PROCESSING ROUTINE
                                        ;
                                        ;       ;R4 = ADR OF RPCS1 DEV REG
                                        ;       ;R3 = PROG TBL ADR
                                        ;       ;R2 = COMMAND CODE
                                        ;       ;R1 = COMMAND FLAG WORD
                                        ;       ;R0 = ADR OF BYTE COUNT, IF APPLICABLE
                                        ;
                                        ;
                                        ;       ;CMND FLAGWORD FORMAT:
                                        ;
                                        ;               ;BIT 9 = 1000 = RDHD COMMAND
                                        ;               ;BIT 8 = 400 = DO ECC CORRECTION IF ALLOWED
                                        ;               ;BIT 7 = 200 = PERFORM RETRIES ON CMND
                                        ;               ;BIT 6 = 100 = OFFSET COMMAND
                                        ;               ;BIT 5 = 040 = CMND TERMINATES WITH ATA
                                        ;               ;BIT 4 = 020 = SET UP CYL/HD/SECT #
                                        ;               ;BIT 3 = 010 = INCREMENT BYTE COUNTS
                                        ;               ;BIT 2 = 004 = DATA TRANSFER CMND
                                        ;               ;BIT 1 = 002 = 3 ARGUMENT CMND
                                        ;               ;BIT 0 = 001 = 4 ARGUMENT CMND
                                        ;
                                        ;
005416' 010067  174722          CMDCOM: MOV     R0,CNTADR               ;SAVE ADR OF BYTE COUNT
005422' 004767  176764                  JSR     PC,ACQHSK               ;ACQUIRE & HOUSEKEEP THE DISK
005426' 010167  174714                  MOV     R1,CURFLG               ;SAVE FLAGWD FOR TERMINATION
005432' 056702  174734                  BIS     RPCS1V,R2               ;SET PORT SELECT BIT IN CMND CODE
005436' 010267  174706                  MOV     R2,CURCMD               ;SAVE CURR CMND CODE
005442' 032701  000003                  BIT     #3,R1                   ;THIS CMND HAVE BUS ADR & WD CNT?
005446' 001422                          BEQ     10$                     ;Y,N-10$
005450' 012567  174676                  MOV     (R5)+,CURADR            ;STORE 2 WORD BUS ADR
005454' 012567  174674                  MOV     (R5)+,CURADR+2
005460' 012500                          MOV     (R5)+,R0                ;GET BYTE COUNT
005462' 042700  000001                  BIC     #1,R0                   ;MAKE SURE ITS EVEN
005466' 010067  174666                  MOV     R0,CURPBC               ;SAVE POSITIVE BYTE CNT
005472' 000241                          CLC                             ;MAKE IT A WORD COUNT
005474' 006000                          ROR     R0
005476' 005400                          NEG     R0                      ;MAKE IT NEGATIVE
005500' 010067  174652                  MOV     R0,CURCNT               ;SAVE IT
005504' 032701  000001                  BIT     #1,R1                   ;THERE A 4TH WORD?
005510' 001401                          BEQ     10$                     ;Y,N-10$
005512' 005725                          TST     (R5)+                   ;BYPASS IT
005514' 032767  001000  172260  10$:    BIT     #VVFLG,DFLGWD           ;VVON STATEMENT IN EFFECT?
005522' 001006                          BNE     20$                     ;Y,N-20$
005524' 032764  000100  000012          BIT     #VV,RPDS(R4)            ;IS THE VV BIT SET?
005532' 001002                          BNE     20$                     ;N,Y-20$
005534' 112714  000023                  MOVB    #023,(R4)               ;ISSUE PACK ACKNOWLEDGE CMND
005540' 004767  000112          20$:    JSR     PC,SUIORG               ;GO SET UP REGS FOR I/O
005544' 016700  174626                  MOV     RPOFV,R0                ;GET RPOF BIT VALUES
005550' 032701  000100                  BIT     #100,R1                 ;THIS THE OFFSET CMND?
005554' 001402                          BEQ     30$                     ;Y,N-30$
005556' 012546                          MOV     (R5)+,-(SP)             ;RETRIEVE OFFSET VALUE
005560' 152600                          BISB    (SP)+,R0                ;SET IT IN RPOF VALUE
005562' 010064  000032          30$:    MOV     R0,RPOF(R4)             ;LOAD UP RPOF REGISTER
005566' 016767  172220  174570          MOV     RTRY,CURRTY             ;INITIALIZE RETRY COUNT
005574' 005067  174566                  CLR     RTRYIP                  ;CLEAR RETRY IN PROGRESS FLAG
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1439  005600' 012767 003503 001770          MOV   #IOTERM-ERRBAS,INTEAD   ;INIT TERMINATION ERROR MSG
1440  005606' 052767 000002 172166          BIS   #DOTERM,DFLGWD          ;SET THE "PROCESS TERMINATION" FLAG
1441  005614' 052713 000010                 BIS   #WT4IOT,(R3)            ;SET WAITING FOR I/O TERM FLAG
1442  005620' 052767 000300 172154          BIS   #CMDISU+ANYIOI,DFLGWD   ;SET CMND ISSUED FLAGS
1443  005626' 010214                        MOV   R2,(R4)                 ;ISSUE SPECIFIED CMND
1444  005630' 005767 172146                 TST   DFLGWD                  ;"NOWAIT" BIT ?
1445  005634' 100003                        BPL   40$                     ;Y,N-40$
1446  005636' 042713 000010                 BIC   #WT4IOT,(R3)            ;RESET WAITING FOR I/O TERM
1447  005642' 000404                        BR    50$                     ;GO TO EXIT
1448  005644' 004577 172176          40$:   JSR   R5,@CIOBSY              ;WAIT FOR I/O TO COMPLETE
1449  005650' 004767 001626                 JSR   PC,PROCTM               ;GO PROCESS TERMINATION
1450  005654' 000205                 50$:   RTS   R5                      ;EXIT IN-LINE TO USER PROG
1451
1452
1453
1454
1455                                         ;SET UP DEVICE REGS FOR I/O
1456
1457                                         ;JSR    PC,SUIORG       S/R CALL
1458                                         ;
1459                                         ;R4 = RPCS1 ADR
1460                                         ;R3 = PROG TBL ADR
1461                                         ;R2 = CMND CODE
1462                                         ;R1 = CMND FLAGWORD
1463                                         ;
1464                                         ;DESTROYS R0
1465
1466  005656' 032701 000020          SUIORG: BIT   #20,R1                  ;NEED TO SET UP CYL/HEAD/SECT?
1467  005662' 001412                        BEQ   10$                     ;Y,N-10$
1468  005664' 016764 172114 000034          MOV   CYL,RPDC(R4)            ;LOAD CYL #
1469  005672' 016746 172110                 MOV   HEAD,-(SP)              ;GET HEAD #
1470  005676' 000316                        SWAB  (SP)                    ;PUT IN CORRECT BIT POSITION
1471  005700' 116716 172104                 MOVB  SECT,(SP)               ;SET IN SECT #
1472  005704' 012664 000006                 MOV   (SP)+,RPDA(R4)          ;LOAD HEAD & SECT #'S
1473  005710' 032701 000004          10$:   BIT   #4,R1                   ;DATA XFER CMND?
1474  005714' 001423                        BEQ   30$                     ;Y,N-30$
1475  005716' 016700 174430                 MOV   CURADR,R0               ;GET HIGH BITS OF ADR
1476  005722' 042700 177774                 BIC   #177774,R0              ;RESET BITS ABOVE A17
1477  005726' 000300                        SWAB  R0                      ;ALIGN BITS A16 & A17
1478  005730' 050002                        BIS   R0,R2                   ;SET THEM INTO CMND CODE WORD
1479  005732' 016764 174416 000004          MOV   CURADR+2,RPBA(R4)       ;LOAD BITS 0-15 OF ADR
1480  005740' 032777 000010 172116          BIT   #CPU70,@CSYSFW          ;RUNNING ON AN 11/70?
1481  005746' 001403                        BEQ   20$                     ;Y,N-20$
1482  005750' 016764 174376 000050          MOV   CURADR,RPBAE(R4)        ;MOVE BITS A16-A21 TO ADR EXT
1483  005756' 016764 174374 000002  20$:    MOV   CURCNT,RPWC(R4)         ;LOAD WORD COUNT
1484  005764' 000207                 30$:    RTS   PC                      ;EXIT IN-LINE
```

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                                        .SBTTL  RP04/RP05/RP06 INTERRUPT SERVICE ROUTINE


005766' 004067 003346          RHPINT: JSR     R0,SAVREG               ;SAVE ALL REGISTERS
005772' 004567 003414                  JSR     R5,STSTAT               ;GO STORE ALL DEV REG'S
005776' 174136                         .WORD   ISTAT-.
006000' 005267 174334                  INC     INTCNT                  ;ADD 1 TO INTERRUPT CNT
006004' 004767 003362                  JSR     PC,SUPTAD               ;SET UP PROG TBL & RPCS1 ADR'S
006010' 032767 000010 171764           BIT     #SWOVER,DFLGWD          ;WAITING FOR SWITCH OVER INT?
006016' 001457                         BEQ     TRMINT                  ;Y,N-TRMINT
006020' 016400 000016                  MOV     RPAS(R4),R0             ;GET ATA REG CONTENTS
006024' 105700                         TSTB    R0                      ;ANY ATA LINES SET?
006026' 001011                         BNE     10$                     ;N,Y-10$
006030' 012767 003531 176620           MOV     #NOATA-ERMBAS,ACQIAD    ;SET UP ADR OF NO ATA ON INT ERR
006036' 042713 000010          5$:     BIC     #WT4IOT,(R3)            ;RESET WAITING FOR I/O TERM FLAG
006042' 052767 000020 171732           BIS     #SWOIER,DFLGWD          ;SET ERROR ON SWITCH OVER INT
006050' 000470                         BR      INTEX                   ;GO TO INT EXIT
006052' 036700 177100          10$:    BIT     MYATA,R0                ;IS IT MY ATA?
006056' 001003                         BNE     15$                     ;N,Y-15$
006060' 010064 000016                  MOV     R0,RPAS(R4)             ;RESET OTHER ATA
006064' 000431                         BR      25$                     ;GO SET INT ENABLE
006066' 032764 100000 000012  15$:     BIT     #ATA,RPDS(R4)           ;DO I HAVE THE DISK?
006074' 001004                         BNE     17$                     ;N,Y-17$
006076' 116764 177054 000016           MOVB    MYATA,RPAS(R4)          ;RESET MY ATA LINE
006104' 000421                         BR      25$                     ;GO SET INT ENB & EXIT
006106' 036700 177046          17$:    BIT     OTHATA,R0               ;OTHER ATA LINES SET?
006112' 001402                         BEQ     18$                     ;Y,N-18$
006114' 010064 000016                  MOV     R0,RPAS(R4)             ;RESET OTHER ATA
006120' 032764 000400 000012  18$:     BIT     #DPR,RPDS(R4)           ;DRIVE PRESENT SET?
006126' 001004                         BNE     20$                     ;N,Y-20$
006130' 012767 003457 176520           MOV     #DPNSET-ERMBAS,ACQIAD   ;SET UP ADR OF DRV NOT PRES ERR MSG
006136' 000737                         BR      5$                      ;GO CLEAR FLAGS
006140' 112714 000011          20$:    MOVB    #011,(R4)               ;RESET MY ATA WITH DRIVE CLEAR
006144' 042713 000010                  BIC     #WT4IOT,(R3)            ;RESET WAITING FOR I/O TERM FLAG
006150' 112714 000101          25$:    MOVB    #101,(R4)               ;SET INT ENABLE WITH NOP CMND
006154' 000426                         BR      INTEX                   ;GO TO INT EXIT

006156' 016701 174164          TRMINT: MOV     CURFLG,R1               ;GET THIS CMND'S FLGWD
006162' 005714                         TST     (R4)                    ;IS 'SC' BIT SET?
006164' 100426                         BMI     CKSC                    ;N,Y-CKSC
006166' 032701 000040                  BIT     #40,R1                  ;CMND SUPPOSED TO SET ATA?
006172' 001406                         BEQ     CLRWTF                  ;Y,N-CLRWTF
006174' 012767 003531 001374           MOV     #NOATA-ERMBAS,INTEAD    ;SET UP NO ATA ERR MSG ADR
006202' 052767 000001 171572  SETERR:  BIS     #IOERR,DFLGWD           ;SET THE TERMINATION I/O ERR FLAG
006210' 042713 000010         CLRWTF:  BIC     #WT4IOT,(R3)            ;RESET WAITING FOR I/O TERM
006214' 032767 000004 174124           BIT     #4,CURFLG               ;THIS A DATA TRANSFER CMND?
006222' 001403                         BEQ     INTEX                   ;Y,N-INTEX
006224' 016467 000002 174130           MOV     RPWC(R4),FINCNT         ;SAVE FINAL WORD COUNT
006232' 004067 003116          INTEX:  JSR     R0,RESREG               ;RESTORE ALL REGISTERS
006236' 000177 171632                  JMP     @RTNINT                 ;EXIT FROM INTERRUPT

006242' 032714 020000          CKSC:   BIT     #MCPE,(R4)              ;MCPE ERROR SET?
006246' 001402                         BEQ     28$                     ;N,Y-HARDER
006250' 000167 000400                  JMP     HARDER
006254' 032714 040000          28$:    BIT     #TRE,(R4)               ;TRE ERROR BIT SET?
006260' 001031                         BNE     ERRFND                  ;N,Y-ERRFND
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1542  006262' 032764 040000 000012        BIT   #ERR,RPDS(R4)          ;ERROR SUMMARY BIT SET?
1543  006270' 001025                       BNE   ERRFND                 ;N,Y-ERRFND
1544  006272' 016400 000016               MOV   RPAS(R4),R0            ;GET ATA REG
1545  006276' 036700 176654               BIT   MYATA,R0               ;MY ATA BIT SET?
1546  006302' 001011                       BNE   40$                    ;N,Y-40$
1547  006304' 010064 000016               MOV   R0,RPAS(R4)            ;RESET OTHER ATA BITS
1548  006310' 032701 000004               BIT   #4,R1                  ;DATA XFER CMND?
1549  006314' 001335                       BNE   CLRWTF                 ;N,Y-CLRWTF
1550  006316' 036764 176634 000016 30$:    BIT   MYATA,RPAS(R4)         ;MY ATA SET?
1551  006324' 001774                       BEQ   30$                    ;Y,N-30$
1552  006326' 032701 000040        40$:    BIT   #40,R1                 ;CMND SUPPOSED TO SET ATA?
1553  006332' 001326                       BNE   CLRWTF                 ;N,Y-CLRWTF
1554  006334' 012767 003551 001234        MOV   #UXPATA-ERMBAS,INTEAD  ;SET UP UNEXP ATA ERR MSG ADR
1555  006342' 000717                       BR    SETERR                 ;GO TO ERROR EXIT
1556
1557  006344' 032764 037400 000010 ERRFND: BIT   #037400,RPCS2(R4)      ;UPE/NED/NEM/PGE/MXF/MDPE
1558  006352' 001140                       BNE   HARDER                 ;IN RPCS2? (N,Y-HARDER)
1559  006354' 032764 067057 000014        BIT   #067057,RPER1(R4)      ;UNS/OPI/WLE/IAE/AOE/WCF/PAR/RMR/
1560  006362' 001134                       BNE   HARDER                 ;ILR/ILF IN RPER1? (N,Y-HARDER)
1561  006364' 032764 137777 000040        BIT   #137777,RPER2(R4)      ;ACU/PLU/3OVU/IXE/NHS/MHS/WRU/ABS/
1562                                                                     ;FEN/TUF/TDF/RAW/MSE/CSU/WSU/CSF/
1563  006372' 001130                       BNE   HARDER                 ;WCU IN RPER2? (N,Y-HARDER)
1564  006374' 032764 160153 000042        BIT   #160153,RPER3(R4)      ;OCYL/SKI/OPE/DCL/ACL/UWR/WAO/VUF/
1565  006402' 001124                       BNE   HARDER                 ;DCU/PSU IN RPER3? (N,Y-HARDER)
1566  006404' 032764 140000 000010        BIT   #140000,RPCS2(R4)      ;DLT OR WCE IN RPCS2?
1567  006412' 001004                       BNE   CKRTRY                 ;N,Y-CKRTRY
1568  006414' 032764 010720 000014        BIT   #010720,RPER1(R4)      ;DTE/HCRC/HCE/ECH/FER IN RPER1?
1569  006422' 001524                       BEQ   CKCORR                 ;Y,N-CKCORR
1570  006424' 005767 173736        CKRTRY: TST   RTRYIP                 ;ALREADY DONE RETRIES ON THIS CMND?
1571  006430' 001063                       BNE   55$                    ;N,Y-55$
1572  006432' 005767 173726               TST   CURRTY                 ;ARE RETRIES SPECIFIED?
1573  006436' 001506                       BEQ   HARDER                 ;Y,N-HARDER
1574  006440' 032764 100000 000010        BIT   #100000,RPCS2(R4)      ;DLT ERROR?
1575  006446' 001403                       BEQ   42$                    ;Y,N-42$
1576  006450' 005267 173644               INC   DLTCNT                 ;ADD 1 TO DLT COUNT
1577  006454' 000451                       BR    55$                    ;GO CK RETRY COUNT
1578  006456' 032764 010000 000014 42$:    BIT   #10000,RPER1(R4)       ;DTE ERROR?
1579  006464' 001403                       BEQ   44$                    ;Y,N-44$
1580  006466' 005267 173630               INC   DTECNT                 ;ADD 1 TO DTE COUNT
1581  006472' 000442                       BR    55$                    ;GO CK RETRY COUNT
1582  006474' 032764 000400 000014 44$:    BIT   #400,RPER1(R4)         ;HCRC ERROR?
1583  006502' 001403                       BEQ   46$                    ;Y,N-46$
1584  006504' 005267 173614               INC   HCRCNT                 ;ADD 1 TO HCRC COUNT
1585  006510' 000433                       BR    55$                    ;GO CK RETRY COUNT
1586  006512' 032764 000020 000014 46$:    BIT   #20,RPER1(R4)          ;FER ERROR?
1587  006520' 001403                       BEQ   48$                    ;Y,N-48$
1588  006522' 005267 173600               INC   FERCNT                 ;ADD 1 TO FER COUNT
1589  006526' 000424                       BR    55$                    ;GO CK RETRY COUNT
1590  006530' 032764 000200 000014 48$:    BIT   #200,RPER1(R4)         ;HCE ERROR?
1591  006536' 001403                       BEQ   50$                    ;Y,N-50$
1592  006540' 005267 173564               INC   HCECNT                 ;ADD 1 TO HCE COUNT
1593  006544' 000415                       BR    55$                    ;GO CK RETRY COUNT
1594  006546' 032764 100000 000014 50$:    BIT   #100000,RPER1(R4)      ;DCK ERROR?
1595  006554' 001403                       BEQ   52$                    ;Y,N-52$
1596  006556' 005267 173550               INC   DCKCNT                 ;ADD 1 TO DCK COUNT
1597  006562' 000406                       BR    55$                    ;GO CK RETRY COUNT
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1598  006564' 032764 040000 000010 52$:   BIT   #40000,RPCS2(R4)          ;WCE ERROR?
1599  006572' 001402                      BEQ   55$                       ;Y,N-55$
1600  006574' 005267 173534               INC   WCECNT                    ;ADD 1 TO WCE COUNT
1601  006600' 005367 173560        55$:   DEC   CURRTY                    ;DECREMENT RETRY COUNT
1602  006604' 100004                      BPL   60$                       ;CNT EXHAUSTED? (Y,N-60$)
1603  006606' 012767 003570 000762        MOV   #RTYEXH-ERMBAS,INTEAD     ;SET UP EXHAUSTED RETRIES ERR MSG ADR
1604  006614' 000425                      BR    JSETER                    ;GO TO ERROR EXIT
1605  006616' 005267 173514        60$:   INC   RETRYS                    ;ADD 1 TO RETRY TOTAL CNT
1606  006622' 005267 173540               INC   RTRYIP                    ;SET RETRY IN PROGRESS FLAG
1607  006626' 012714 040011               MOV   #40011,(R4)               ;ISSUE RH11 & DRIVE CLEAR
1608  006632' 016702 173512               MOV   CURCMD,R2                 ;GET CURR CMND IN R2
1609  006636' 004767 177014               JSR   PC,SUIORG                 ;SET UP DEV REGS
1610  006642' 005063 000030               CLR   PTOCNT(R3)                ;HSKP T/O COUNT
1611  006646' 010214                      MOV   R2,(R4)                   ;RE-ISSUE THE ORIG CMND
1612  006650' 000167 177356        JINTEX: JMP   INTEX                    ;GO TO INT EXIT
1613
1614  006654' 032764 040000 000014 HARDER: BIT   #UNS,RPER1(R4)           ;IS THE UNSAFE BIT SET?
1615  006662' 001402                      BEQ   JSETER                    ;Y,N-SETERR
1616  006664' 112714 000011               MOVB  #011,(R4)                 ;ISSUE DRIVE CLEAR FOR UNSAFE COND
1617  006670' 000167 177306        JSETER: JMP   SETERR                   ;GO TO ERROR EXIT
1618
1619  006674' 032764 100000 000014 CKCORR: BIT   #100000,RPER1(R4)        ;DCK SHD BE SET - IS IT?
1620  006702' 001764                      BEQ   HARDER                    ;Y,N-HARDER (NO ERROR BITS SET)
1621  006704' 032767 002000 171070        BIT   #CORFLG,DFLGWD            ;CORON STATEMENT IN EFFECT?
1622  006712' 001244                      BNE   CKRTRY                    ;Y,N-CKRTRY
1623  006714' 032764 010000 000032        BIT   #10000,RPOF(R4)           ;IN 18 BIT WORD MODE?
1624  006722' 001640                      BEQ   CKRTRY                    ;N,Y-CKRTRY
1625  006724' 032764 004000 000032        BIT   #4000,RPOF(R4)            ;IS THE ECI BIT SET?
1626  006732' 001234                      BNE   CKRTRY                    ;N,Y-CKRTRY
1627  006734' 005764 000046               TST   RPEC2(R4)                 ;ECC BIT PATTERN = 0?
1628  006740' 001004                      BNE   70$                       ;Y,N-70$
1629  006742' 012767 003612 000626        MOV   #INVPAT-ERMBAS,INTEAD     ;SET UP INV BIT PATTERN ERR MSG ADR
1630  006750' 000747                      BR    JSETER                    ;GO TO ERROR EXIT
1631  006752' 026427 000044 010041 70$:   CMP   RPEC1(R4),#10041           ;ECC BIT POSITION TOO BIG?
1632  006760' 101404                      BLOS  80$                       ;Y,N-80$
1633  006762' 012767 003636 000606        MOV   #INVPOS-ERMBAS,INTEAD     ;SET UP INV BIT POSITION ERR MSG ADR
1634  006770' 000737                      BR    JSETER                    ;GO TO ERROR EXIT
1635  006772' 016405 000002        80$:   MOV   RPWC(R4),R5               ;GET REMAINING NEG WORD CNT
1636  006776' 006305                      ASL   R5                        ;MAKE IT A BYTE CNT
1637  007000' 066705 173354               ADD   CURPBC,R5                 ;ADD IN ORIG POS BYTE CNT
1638  007004' 001607                      BEQ   CKRTRY                    ;ANY BYTES READ? (Y,N-CKRTRY)
1639  007006' 005001                      CLR   R1                        ;RESET DATA START DISPL VALUE
1640  007010' 012746 001000               MOV   #512.,-(SP)               ;INITIALIZE BLOCK LENGTH
1641  007014' 032767 001000 173324        BIT   #1000,CURFLG              ;READ HEADER AND DATA CMND?
1642  007022' 001402                      BEQ   85$                       ;Y,N-85$
1643  007024' 062716 000010               ADD   #8.,(SP)                  ;ALLOW FOR HEADER WORDS
1644  007030' 020516               85$:   CMP   R5,(SP)                   ;REACHED START OF BAD BLOCK?
1645  007032' 101403                      BLOS  90$                       ;N,Y-90$
1646  007034' 061601                      ADD   (SP),R1                   ;ADD BLK LNGTH TO DATA DISPL
1647  007036' 161605                      SUB   (SP),R5                   ;REDUCE BYTE READ CNT
1648  007040' 000773                      BR    85$                       ;GO CK IT NOW
1649  007042' 162716 001000        90$:   SUB   #512.,(SP)                ;REMOVE CNT FOR DATA WORDS
1650  007046' 062601                      ADD   (SP)+,R1                  ;ALLOW FOR HEADER WDS IF NEEDED
1651  007050' 016400 000044               MOV   RPEC1(R4),R0              ;GET ECC BIT POSITION VALUE
1652  007054' 005300                      DEC   R0                        ;ADJ IT FOR SHIFTING
1653  007056' 010002                      MOV   R0,R2                     ;SET UP A SHIFT COUNT
```

```
1654  007060' 042702 177760          BIC   #177760,R2          ;ISOLATE SHIFT CNT BITS
1655  007064' 040200                 BIC   R2,R0               ;CLEAR SHIFT CNT BITS IN BIT POSITION
1656  007066' 006200                 ASR   R0                  ;CONVERT BIT POSITION TO A WORD
1657  007070' 006200                 ASR   R0                  ;DISPL INTO THE DATA IN THIS
1658  007072' 006200                 ASR   R0                  ;BLOCK
1659  007074' 060001                 ADD   R0,R1               ;ADD IT TO DATA DISPL VALUE
1660  007076' 020167 173256          CMP   R1,CURPBC           ;CORRECTION WITHIN USER'S DATA?
1661  007102' 103026                 BHIS  110$                ;Y,N-110$
1662  007104' 005267 173204          INC   CECCER              ;ADD 1 TO CORRECTABLE ECC ERROR CNT
1663  007110' 016405 000046          MOV   RPEC2(R4),R5        ;GET ECC BIT PATTERN
1664  007114' 005046                 CLR   -(SP)               ;CLEAR SHIFT INTO WORD
1665  007116' 005302          95$:   DEC   R2                  ;DECREMENT SHIFT COUNT
1666  007120' 002403                 BLT   100$                ;FINISHED SHIFTING? (N,Y-100$)
1667  007122' 006305                 ASL   R5                  ;DO A BIT SHIFT ON 2 WORDS
1668  007124' 006116                 ROL   (SP)
1669  007126' 000773                 BR    95$                 ;GO CK SHIFT CNT
1670  007130' 004767 000052   100$:  JSR   PC,DOCORR           ;CORRECT 1ST WORD OF PAIR
1671  007134' 012605                 MOV   (SP)+,R5            ;GET 2ND CORRECTION WORD
1672  007136' 062701 000002          ADD   #2,R1               ;INCR DATA DISPL VALUE
1673  007142' 020167 173212          CMP   R1,CURPBC           ;STILL WITHIN HIS DATA?
1674  007146' 103002                 BHIS  105$                ;Y,N-105$
1675  007150' 004767 000032          JSR   PC,DOCORR           ;CORRECT 2ND WORD OF PAIR
1676  007154' 004767 002212   105$:  JSR   PC,SUPTAD           ;SET UP R3 & R4 AGAIN
1677  007160' 005764 000002   110$:  TST   RPWC(R4)            ;ANY MORE DATA TO READ?
1678  007164' 001002                 BNE   115$                ;Y,N-115$
1679  007166' 000167 177016          JMP   CLRWTF              ;GO CLEAR WAIT FLG & EXIT
1680  007172' 112714 000011   115$:  MOVB  #011,(R4)           ;ISSUE DRIVE CLEAR CMND
1681  007176' 116714 173146          MOVB  CURCMD,(R4)         ;RESUME ORIG CMND
1682  007202' 000167 177024          JMP   INTEX               ;GO TO INT EXIT
1683
1684
1685
1686                                 ;DO ECC DATA CORRECTION
1687
1688                                         ;JSR    PC,DOCORR       S/R CALL
1689                                         ;
1690                                         ;R1 = DATA WORD DISPLACEMENT
1691                                         ;R5 = BIT PATTERN
1692
1693  007206' 016703 173140   DOCORR: MOV   CURADR,R3           ;GET DATA'S ABS STARTING ADR
1694  007212' 016704 173136          MOV   CURADR+2,R4
1695  007216' 060104                 ADD   R1,R4               ;ADD DATA DISPL INTO IT
1696  007220' 005503                 ADC   R3
1697  007222' 032777 000001 170634  BIT   #MMVER,@CSYSFW       ;RUNNING UNDER MEM MGMNT?
1698  007230' 001424                 BEQ   20$                 ;Y,N-20$
1699  007232' 010400                 MOV   R4,R0               ;LOW 16 BITS TO A WORK REG
1700  007234' 042704 177700          BIC   #177700,R4          ;ISOLATE UP TO 32 WORD OFFSET
1701  007240' 052704 100000          BIS   #P4CONS,R4          ;SET ADR TO SELECT PAGE 4
1702  007244' 012702 000006          MOV   #6,R2               ;SET UP SHIFT CNT
1703  007250' 006203          10$:   ASR   R3                  ;SHIFT ADR 1 BIT
1704  007252' 006000                 ROR   R0
1705  007254' 005302                 DEC   R2                  ;GOT HI 16 BITS IN 1 WORD?
1706  007256' 001374                 BNE   10$                 ;Y,N-10$
1707  007260' 013746 172350          MOV   @#KPAR4,-(SP)       ;SAVE PAGE 4 STUFF
1708  007264' 013746 172310          MOV   @#KPDR4,-(SP)
1709  007270' 010037 172350          MOV   R0,@#KPAR4          ;SET PAGE 4 TO USER'S ARREA
```

```
1710  007274' 012737  077406  172310          MOV     #PDRCON,@#KPDR4
1711  007302' 011400                  20$:    MOV     (R4),R0                 ;GET DATA WORD READ
1712  007304' 040514                          BIC     R5,(R4)                 ;RESET PATTERN'S BITS IN WORD READ
1713  007306' 040005                          BIC     R0,R5                   ;RESET WORD READ BITS IN PAT WORD
1714  007310' 050514                          BIS     R5,(R4)                 ;SET REMAINING SINGLE BITS BACK IN
1715  007312' 032777  000001  170544          BIT     #MMVER,@CSYSFW          ;RUNNING UNDER MEM MGMNT?
1716  007320' 001404                          BEQ     30$                     ;Y,N-30$
1717  007322' 012637  172310                  MOV     (SP)+,@#KPDR4           ;RESTORE PAGE 4'S REGS
1718  007326' 012637  172350                  MOV     (SP)+,@#KPAR4
1719  007332' 000207                  30$:    RTS     PC                      ;EXIT IN-LINE
```

```
                                        .SBTTL  SUBROUTINES FOR RP04/RP05/RP06 FUNCTION ROUTINES


                                        ;CHECK IF DEVICE IS BUSY AND WAIT IF IT IS

                                                ;JSR    PC,CKDBSY       S/R CALL
                                                ;
                                                ;DESTROYS R0,R3,R4
                                                ;ON EXIT:  R3 = PROG TBL ADR
                                                ;          R4 = RPCS1 ADR

007334' 004767  002032          CKDBSY: JSR     PC,SUPTAD               ;SET UP PROG TBL & RPCS1 ADR'S
007340' 016400  000010          10$:    MOV     RPCS2(R4),R0            ;GET CURR UNIT #
007344' 010046                          MOV     R0,-(SP)                ;SAVE IT
007346' 042700  177747                  BIC     #177747,R0              ;RESET UNIT # & OTHER BITS
007352' 156300  000035                  BISB    PCUROV(R3),R0           ;SET IN MY UNIT #
007356' 110064  000010                  MOVB    R0,RPCS2(R4)            ;SELECT MY DRIVE
007362' 011400                          MOV     (R4),R0                 ;GET RPCS1 REG
007364' 112664  000010                  MOVB    (SP)+,RPCS2(R4)         ;RESTORE ORIG UNIT #
007370' 032700  000100                  BIT     #100,R0                 ;INT ENABLE ON?
007374' 001403                          BEQ     20$                     ;Y,N-20$
007376' 004577  170444          15$:    JSR     R5,@CIOBSY              ;RELEASE CONTROL
007402' 000756                          BR      10$                     ;GO CK AGAIN
007404' 032767  000004  170370  20$:    BIT     #UNLDIP,DFLGWD          ;DO I HAVE AN UNLOAD IN PROGRESS?
007412' 001403                          BEQ     25$                     ;Y,N-25$
007414' 052713  000010                  BIS     #WT4IOT,(R3)            ;SET WAITING FOR I/O TERM
007420' 000766                          BR      15$                     ;GO RELEASE CONTROL
007422' 032767  000002  170352  25$:    BIT     #DOTERM,DFLGWD          ;HAVE TO PROCESS PREV TERMINATION?
007430' 001403                          BEQ     30$                     ;Y,N-30$
007432' 004767  000044                  JSR     PC,PROCTM               ;GO PROCESS TERMINATION
007436' 000740                          BR      10$                     ;GO CK INT ENABLE AGAIN
007440' 016767  170362  000012  30$:    MOV     IVCTAD,40$              ;STORE INT VECTOR ADR
007446' 016767  170356  000006          MOV     PSWD,45$                ;STORE PROC STATUS WORD
007454' 004577  170406                  JSR     R5,@SETVEC              ;GO SET UP INTERRUPT VECTOR
007460' 000000                  40$:    .WORD   XXXX                    ;  INT VECTOR ADR
007462' 000000                  45$:    .WORD   XXXX                    ;  PSW
007464' 176302                          .WORD   RHPINT-.                ;  REL INT ROUT ADR
007466' 010567  172650          STMADR: MOV     R5,ERRADR               ;SAVE CURR USER STMNT ADR
007472' 162767  000004  172642          SUB     #4,ERRADR
007500' 000207                          RTS     PC                      ;EXIT IN-LINE


                                        ;PROCESS TERMINATION OF PREVIOUS I/O FUNCTION

                                                ;JSR    PC,PROCTM       S/R CALL
                                                ;
                                                ;R3 = PROG TABLE ADR
                                                ;
                                                ;DESTROYS R0

007502' 010146                  PROCTM: MOV     R1,-(SP)                ;SAVE R1 & R2
007504' 010246                          MOV     R2,-(SP)
007506' 042767  000002  170266          BIC     #DOTERM,DFLGWD          ;RESET PROCESS TERMINATION FLAG
007514' 032767  000010  172624          BIT     #10,CURFLG              ;INCR BYTE COUNT?
007522' 001417                          BEQ     20$                     ;Y,N-20$
007524' 016700  172626                  MOV     CURCNT,R0               ;GET INITIAL WORD CNT
```

```
1777  007530' 005400                        NEG     R0                      ;MAKE IT POSITIVE AGAIN
1778  007532' 016701  172624                MOV     FINCNT,R1               ;GET FINAL WORD CNT
1779  007536' 100001                        BPL     10$                     ;IS IT NEGATIVE? (Y,N-10$)
1780  007540' 005401                        NEG     R1                      ;MAKE IT POSITIVE
1781  007542' 160100                 10$:   SUB     R1,R0                   ;SUB REMAINING CNT FROM INITIAL CNT
1782  007544' 006300                        ASL     R0                      ;MAKE IT A BYTE CNT
1783  007546' 010067  170246                MOV     R0,SIZE                 ;STORE # OF BYTES ACTUALLY XFERRED
1784  007552' 016701  172566                MOV     CNTADR,R1               ;GET ADR OF BYTE CNT TOTALS
1785  007556' 060011                        ADD     R0,(R1)                 ;ADD IN THIS CNT
1786  007560' 005541                        ADC     -(R1)                   ;UPDATE MOST SIGNF WORD OF CNT
1787  007562' 032767  000001  170212 20$:   BIT     #IOERR,DFLGWD           ;WAS THERE AN ERROR?
1788  007570' 001412                        BEQ     PROCEX                  ;Y,N-PROCEX
1789  007572' 004567  000132                JSR     R5,ERRIS                ;GO ISSUE I/O TERMINATION
1790  007576' 003503                 INTEAD: .WORD   IOTERM-ERMBAS           ;ERROR MSG
1791  007600' 004767  000024                JSR     PC,RINTV                ;RESET THE INT VECTOR
1792  007604' 012602                        MOV     (SP)+,R2                ;RESTORE R1 & R2
1793  007606' 012601                        MOV     (SP)+,R1
1794  007610' 004577  170234                JSR     R5,@CUPGER              ;GO TO MPG ERR RETN POINT
1795  007614' 000207                        RTS     PC                      ;RETURN IN-LINE
1796  007616' 004767  000006          PROCEX: JSR     PC,RINTV                ;GO RESET INT VECTOR
1797  007622' 012602                        MOV     (SP)+,R2                ;RESTORE R1 & R2
1798  007624' 012601                        MOV     (SP)+,R1
1799  007626' 000207                        RTS     PC                      ;EXIT IN-LINE
1800
1801
1802                                        ;RESET INTERRUPT VECTOR S/R
1803
1804                                                ;JSR    PC,RINTV        S/R CALL
1805                                                ;R3 MUST CONTAIN PROG TBL ADR
1806                                                ;DESTROYS R0
1807
1808  007630' 004567  000020          RINTV: JSR     R5,TVECT                ;GO CK IF I HAVE VECTOR CONTROL
1809  007634' 000406                        BR      RINTEX                  ;BR IF I DON'T
1810  007636' 016767  170164  000004        MOV     IVCTAD,10$              ;GET CURR INT VECT ADR
1811  007644' 004577  170220                JSR     R5,@CLRVEC              ;GO HAVE MPG CLEAR IT
1812  007650' 000000                 10$:   .WORD   XXXX
1813  007652' 000207                 RINTEX: RTS    PC                      ;EXIT IN-LINE
1814
1815
1816                                        ;TEST INTERRUPT VECTOR S/R
1817
1818                                                ;JSR    R5,TVECT        S/R CALL
1819                                                ;BR     LABEL           EXECUTED IF NOT SAME
1820                                                ;R3 MUST CONTAIN PROG TBL ADR
1821                                                ;DESTROYS R0
1822
1823  007654' 016767  170146  000010  TVECT: MOV     IVCTAD,20$              ;GET CURR INT VECT ADR
1824  007662' 016346  000004                MOV     PFWADR(R3),-(SP)        ;STORE FLGWD ADR TO IDENTIFY ME
1825  007666' 004577  170200                JSR     R5,@TSTVEC              ;DO I HAVE VECTOR CONTROL?
1826  007672' 000000                 20$:   .WORD   XXXX                    ;  MPG WILL TELL ME SINCE I CAN'T
1827  007674' 176072                        .WORD   RHPINT-.                ;  GET AT LOWER MEM IF MEM MGMT
1828  007676' 000401                        BR      TVECTX                  ;BR IF I DONT'T HAVE CNTRL
1829  007700' 005725                        TST     (R5)+                   ;BYPASS BR INST IN S/R CALL
1830  007702' 000205                 TVECTX: RTS    R5                      ;EXIT IN-LINE
```

```
                                                ;ERROR INFORMATION DISPLAY S/R
                                                ;
                                                ;JSR    R5,ERRCS         S/R CALL FOR CURR STATUS
                                                ;JSR    R5,ERRCS1        S/R CALL FOR CURR STATUS W/O STORING
                                                ;JSR    R5,ERRIS         S/R CALL FOR INT STATUS
                                                ;.WORD  MSGADR-ERMBAS    REL ADR OF ERROR MSG
                                                ;
                                                ;R3 = PROG TABLE ADR
                                                ;DESTROYS R0,R1,R2
007704' 004567 001502          ERRCS:  JSR     R5,STSTAT                ;STOPE CURR STATUS
007710' 172300                         .WORD   CSTAT-.
007712' 012767 171606 000462   ERRCS1: MOV     #CSTAT-ERSTAD,ERSTAD     ;STORE ADR OF CURR STATUS
007720' 012767 172052 000212           MOV     #CSTAT-EBSBAS,EBSTAT
007726' 000406                         BR      ERRCOM                   ;GO TO COMMON POINT
007730' 012767 171532 000444   ERRIS:  MOV     #ISTAT-ERSTAD,ERSTAD     ;STORE ADR OF LAST INT STATUS
007736' 012767 171776 000174           MOV     #ISTAT-EBSBAS,EBSTAT
007744' 012567 000134          ERRCOM: MOV     (R5)+,ERMBAS             ;STORE MSG ADR
007750' 005267 172336                  INC     ERRCNT                   ;ADD 1 TO ERROR CNT
007754' 012767 000001 170040           MOV     #1,ERRI                  ;SET THE ERROR INDICATOR
007762' 032763 000400 000002           BIT     #DOERCK,POPSW(R3)        ;SUPPOSED TO DO ERROR CHECKING?
007770' 001004                         BNE     2$                       ;Y,N-2$
007772' 032763 020000 000002           BIT     #PRONER,POPSW(R3)        ;ERROR PRINTING INHIBITED?
010000' 001402                         BEQ     4$                       ;N,Y-4$
010002' 000167 000462          2$:     JMP     ERREX                    ;GO TO EXIT
010006' 010446                 4$:     MOV     R4,-(SP)                 ;SAVE R4 & R5
010010' 010546                         MOV     R5,-(SP)
010012' 005004                         CLR     R4                       ;SET USER MODE PRINT FLAG
010014' 004767 001502                  JSR     PC,DEVID                 ;DISPLAY DEVICE I.D.
010020' 032767 000100 167754           BIT     #CMDISU,DFLGWD           ;HAS THE CMND BEEN ISSUED?
010026' 001005                         BNE     6$                       ;N,Y-6$
010030' 004567 002066                  JSR     R5,PRINT                 ;PRINT THE "BEFORE ISSUING I/O" MSG
010034' 003270                         .WORD   BEFIO-.
010036' 000030                         .WORD   24.
010040' 000404                         BR      8$                       ;GO CALC MSG LNGTH
010042' 004567 002054          6$:     JSR     R5,PRINT                 ;PRINT THE "AFTER ISSUING I/O" MSG
010046' 003306                         .WORD   AFTIO-.
010050' 000027                         .WORD   23.
010052' 010700                 8$:     MOV     PC,R0                    ;GET START ADR OF ERROR MSG
010054' 062700 000030                  ADD     #ERMBAS-.,R0
010060' 061000                         ADD     (R0),R0
010062' 012701 177777                  MOV     #-1,R1                   ;INITIALIZE MSG LENGTH
010066' 005201                 10$:    INC     R1                       ;ADD 1 TO MSG LENGTH
010070' 105720                         TSTB    (R0)+                    ;MSG TERMINATOR?
010072' 001375                         BNE     10$                      ;Y,N-10$
010074' 010167 000006                  MOV     R1,ERMBAS+2              ;STORE MSG LENGTH
010100' 004567 002016                  JSR     R5,PRINT                 ;PRINT ERROR MSG SPECIFIED
010104' 000000                 ERMBAS: .WORD   XXXX
010106' 000000                         .WORD   XXXX
010110' 026727 177770 003663           CMP     ERMBAS,#INVDVN-ERMBAS    ;INVALID UNIT # MSG OR HIGHER?
010116' 103134                         BHIS    ERRSNM                   ;N,Y-ERRSNM
010120' 010701                         MOV     PC,R1                    ;GET ADR OF CODE  AREA IN ERR MSG
010122' 062701 003102                  ADD     #CODFLD-.,R1
010126' 010700                         MOV     PC,R0                    ;SET UP ADR OF ERROR CODE TBL
010130' 062700 000342                  ADD     #ERCDTB-.,R0
010134' 010702                         MOV     PC,R2                    ;SET UP ADR OF STORED DEV REG'S
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 1888  010136' 062702                EBSBAS: ADD     (PC)+,R2
 1889  010140' 172052                EBSTAT: .WORD   CSTAT-EBSBAS
 1890  010142' 012767  000015  000224        MOV     #13.,70$        ;INITIALIZE MSG LENGTH
 1891  010150' 012746  000100                MOV     #64.,-(SP)      ;INITIALIZE CODE FIELD CNT
 1892  010154' 012205                15$:    MOV     (R2)+,R5        ;GET NEXT DEV REG WORD
 1893  010156' 000305                17$:    SWAB    R5              ;GET DESIRED BYTE IN LOW BYTE
 1894  010160' 112004                20$:    MOVB    (R0)+,R4        ;GET FLAG & LENGTH BYTE
 1895  010162' 005704                        TST     R4              ;END OF THE CODE TBL?
 1896  010164' 001474                        BEQ     60$             ;N,Y-60$
 1897  010166' 122704  000377                CMPB    #377,R4         ;GO TO NXT DEV REG WORD?
 1898  010172' 001770                        BEQ     15$             ;N,Y-15$
 1899  010174' 122704  000376                CMPB    #376,R4         ;GO TO NXT BYTE IN DEV REG WORD?
 1900  010200' 001766                        BEQ     17$             ;N,Y-17$
 1901  010202' 032704  000040                BIT     #40,R4          ;THIS AN 11/70 ONLY ERROR BIT?
 1902  010206' 001405                        BEQ     22$             ;Y,N-22$
 1903  010210' 032777  000010  167646        BIT     #CPU70,@#SYSFW  ;RUNNING ON AN 11/70?
 1904  010216' 001430                        BEQ     35$             ;Y,N-35$
 1905  010220' 000417                        BR      26$             ;GO CK ERROR BIT
 1906  010222' 032704  000010        22$:    BIT     #10,R4          ;THIS AN RP04 ONLY ERROR BIT?
 1907  010226' 001405                        BEQ     24$             ;Y,N-24$
 1908  010230' 032763  000060  000032        BIT     #60,PMDLCD(R3)  ;THIS AN RP04?
 1909  010236' 001020                        BNE     35$             ;Y,N-35$
 1910  010240' 000407                        BR      26$             ;GO CK ERROR BIT
 1911  010242' 032704  000020        24$:    BIT     #20,R4          ;THIS AN RP05/RP06 ONLY ERROR BIT?
 1912  010246' 001404                        BEQ     26$             ;Y,N-26$
 1913  010250' 032763  000060  000032        BIT     #60,PMDLCD(R3)  ;THIS AN RP05/RP06?
 1914  010256' 001410                        BEQ     35$             ;Y,N-35$
 1915  010260' 032704  000100        26$:    BIT     #100,R4         ;BIT VALUE OF 0 = AN ERROR CONDITION?
 1916  010264' 001403                        BEQ     30$             ;Y,N-30$
 1917  010266' 131005                        BITB    (R0),R5         ;THIS BIT RESET IN DEV REG BYTE?
 1918  010270' 001407                        BEQ     40$             ;N,Y-40$
 1919  010272' 000402                        BR      35$             ;GO TO NXT TBL ENTRY
 1920  010274' 131005                30$:    BITB    (R0),R5         ;THIS ERROR BIT SET IN DEV REG BYTE?
 1921  010276' 001004                        BNE     40$             ;N,Y-40$
 1922  010300' 042704  177770        35$:    BIC     #177770,R4      ;ISOLATE ENTRY LENGTH
 1923  010304' 060400                        ADD     R4,R0           ;POINT AT NXT CODE TBL ENTRY
 1924  010306' 000724                        BR      20$             ;GO CK FOR NXT CODE
 1925  010310' 042704  177770        40$:    BIC     #177770,R4      ;ISOLATE I.D. NAME LENGTH + 1
 1926  010314' 020416                        CMP     R4,(SP)         ;ENOUGH ROOM FOR NAME?
 1927  010316' 101017                        BHI     60$             ;Y,N-60$
 1928  010320' 060467  000050                ADD     R4,70$          ;ADJ MSG LENGTH FOR NAME
 1929  010324' 005304                        DEC     R4              ;ADJ FOR BIT MASK CHAR
 1930  010326' 005200                        INC     R0              ;POINT PAST BIT MASK
 1931  010330' 021627  000100                CMP     (SP),#64.       ;FIRST ERROR CODE IN MSG?
 1932  010334' 001403                        BEQ     50$             ;N,Y-50$
 1933  010336' 112721  000054                MOVB    #',,(R1)+       ;MOVE COMMA TO MSG
 1934  010342' 005316                        DEC     (SP)            ;ADJ REMAINING ROOM IN MSG
 1935  010344' 112021                50$:    MOVB    (R0)+,(R1)+     ;MOVE ERROR CODE TO MSG
 1936  010346' 005316                        DEC     (SP)            ;ADJ REMAINING ROOM IN MSG
 1937  010350' 005304                        DEC     R4              ;MOVED ALL NAME CHARS?
 1938  010352' 001374                        BNE     50$             ;Y,N-50$
 1939  010354' 000701                        BR      20$             ;GO CK FOR MORE ERROR BITS
 1940  010356' 005004                60$:    CLR     R4              ;SET USER MODE PRINT
 1941  010360' 022627  000100                CMP     (SP)+,#64.      ;ANY ERROR CODES PUT IN MSG?
 1942  010364' 001404                        BEQ     80$             ;Y,N-80$
 1943  010366' 004567  001530                JSR     R5,PRINT        ;GO ISSUE ERROR BITS MSG
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1944  010372' 002614                          .WORD   DKEMSG-.
1945  010374' 000116                  70$:    .WORD   78.
1946  010376' 004567  001250          80$:    JSR     R5,DISPST               ;DISPLAY DEVICE REG'S
1947  010402' 000000                  ERSTAD: .WORD   XXXX
1948  010404' 004767  001442                  JSR     PC,PRTIWD               ;DISPLAY CYL,HEAD,SECT VALUES
1949  010410' 016300  000022          ERRSNM: MOV     PSRCST(R3),R0           ;GET ADR OF SRC STMNTS
1950  010414' 111001                  110$:   MOVB    (R0),R1                 ;SAVE STMNT LENGTH
1951  010416' 026067  000004  171716          CMP     4(R0),ERRADR            ;ERROR OCCUR ON THIS STMNT?
1952  010424' 001402                          BEQ     120$                    ;N,Y-120$
1953  010426' 060100                          ADD     R1,R0                   ;POINT AT NXT STMNT
1954  010430' 000771                          BR      110$                    ;GO CK NXT STMNT
1955  010432' 005720                  120$:   TST     (R0)+                   ;SET UP ADR OF STMNT # DATA
1956  010434' 010701                          MOV     PC,R1                   ;SET UP DATA OUTPUT ADR
1957  010436' 062701  002542                  ADD     #STMNUM-.,R1
1958  010442' 004577  167414                  JSR     R5,BDECASC              ;CONVERT IT TO ASCII
1959  010446' 012767  020040  002530          MOV     #20040,STMNUM+4         ;SET 2 LOW DIGITS TO SPACES
1960  010454' 004567  001442                  JSR     R5,PRINT                ;ISSUE STMNT # MSG
1961  010460' 002510                          .WORD   STMNMG-.
1962  010462' 177762                          .WORD   -14.
1963  010464' 012605                          MOV     (SP)+,R5                ;RESTORE R5 & R4
1964  010466' 012604                          MOV     (SP)+,R4
1965  010470' 000205                  ERREX:  RTS     R5                      ;EXIT IN-LINE
1966
1967
1968                                          ;ERROR MESSAGE CODE TABLE
1969
1970                                                  ;377 = GO TO NEXT DEVICE REGISTER WORD
1971                                                  ;376 = GO TO NEXT DEVICE REGISTER BYTE
1972                                                  ;
1973                                          ;BYTE 0 CONTAINS FLAG BITS & I.D. NAME LENGTH
1974
1975                                                  BITS 0-2 = LENGTH OF BIT MASK + I.D. NAME
1976                                                  BIT 3 = RP04 ONLY ERROR BIT
1977                                                  BIT 4 = RP05/RP06 ONLY ERROR BIT
1978                                                  BIT 5 = 11/70 ONLY ERROR BIT
1979                                                  BIT 6 = BIT = 0 IS AN ERROR CONDITION
1980
1981                                          ;BYTE 1 IS THE BIT MASK
1982
1983                                          ;BYTES 2 THRU ? ARE THE BIT'S ASCII I.D.
1984
1985  010472' 100003  041523          ERCDTB: .ASCII  <003><200>/SC/          ;RPCS1 - BYTE 1
1986  010476' 040004  051124      105         .ASCII  <004><100>/TRE/
1987  010503'    005  046440  050103          .ASCII  <005><040>/MCPE/
      010510'    105
1988  010511'    104  042010  040526          .ASCII  <104><010>/DVA/
1989  010516'    377                          .BYTE   377
1990  010517'    377                          .BYTE   377
1991  010520'    377                          .BYTE   377
1992  010521'    377                          .BYTE   377
1993  010522' 100004  046104      124         .ASCII  <004><200>/DLT/         ;RPCS2 - BYTE 1
1994  010527'    004  053500  042503          .ASCII  <004><100>/WCE/
1995  010534' 020004  050125      105         .ASCII  <004><040>/UPE/
1996  010541'    004  047020  042105          .ASCII  <004><020>/NED/
1997  010546' 004004  042516      115         .ASCII  <004><010>/NEM/
1998  010553'    004  050004  042507          .ASCII  <004><004>/PGE/
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 1999  010560' 001004  054115     106          .ASCII  <004><002>/MXF/
 2000  010565' 005     046401  050104          .ASCII  <005><001>/MOPE/
       010572' 105
 2001  010573' 377                               .BYTE   377
 2002  010574' 100004  052101     101          .ASCII  <004><200>/ATA/          ;RP05 - BYTE 1
 2003  010601' 004     042500  051122          .ASCII  <004><100>/ERR/
 2004  010606' 020004  044520     120          .ASCII  <004><040>/PIP/
 2005  010613' 104     046420  046117          .ASCII  <104><020>/MOL/
 2006  010620' 000504  050104     122          .ASCII  <104><001>/DPR/
 2007  010625' 376                               .BYTE   376
 2008  010626' 100104  051104     131          .ASCII  <104><200>/DRY/          ;RP05 - BYTE 0
 2009  010633' 103     053100     126          .ASCII  <103><100>/VV/
 2010  010637' 377                               .BYTE   377
 2011  010640' 100004  041504     113          .ASCII  <004><200>/DCK/          ;RPER1 - BYTE 1
 2012  010645' 004     052500  051516          .ASCII  <004><100>/UNS/
 2013  010652' 020004  040117     111          .ASCII  <004><040>/OPI/
 2014  010657' 004     042020  042524          .ASCII  <004><020>/DTE/
 2015  010664' 004004  046127     105          .ASCII  <004><010>/WLE/
 2016  010671' 004     044404  042501          .ASCII  <004><004>/IAE/
 2017  010676' 001004  047501     105          .ASCII  <004><002>/AOE
 2018  010703' 005     044001  051103          .ASCII  <005><001>/HCRC/
       010710' 103
 2019  010711' 376                               .BYTE   376
 2020  010712' 100004  041510     105          .ASCII  <004><200>/ACE/          ;RPER1 - BYTE 0
 2021  010717' 004     042500  044103          .ASCII  <004><100>/ECH/
 2022  010724' 020004  041527     106          .ASCII  <004><040>/WCF/
 2023  010731' 004     043020  051105          .ASCII  <004><020>/FER/
 2024  010736' 004004  040520     122          .ASCII  <004><010>/PAR/
 2025  010743' 004     051004  051115          .ASCII  <004><004>/RMR/
 2026  010750' 001004  046111     122          .ASCII  <004><002>/ILR/
 2027  010755' 004     044401  043114          .ASCII  <004><001>/ILF/
 2028  010762' 377                               .BYTE   377
 2029  010763' 376                               .BYTE   376
 2030  010764' 100005  052101  033501          .ASCII  <005><200>/ATA7/         ;RPAS - BYTE 0
 2031  010772' 040005  052101  033101          .ASCII  <005><100>/ATA6/
 2032  011000' 020005  052101  032501          .ASCII  <005><040>/ATA5/
 2033  011006' 010005  052101  032101          .ASCII  <005><020>/ATA4/
 2034  011014' 004005  052101  031501          .ASCII  <005><010>/ATA3/
 2035  011022' 002005  052101  031101          .ASCII  <005><004>/ATA2/
 2036  011030' 001005  052101  030501          .ASCII  <005><002>/ATA1/
 2037  011036' 000405  052101  030101          .ASCII  <005><001>/ATA0/
 2038  011044' 377                               .BYTE   377
 2039  011045' 377                               .BYTE   377
 2040  011046' 377                               .BYTE   377
 2041  011047' 377                               .BYTE   377
 2042  011050' 377                               .BYTE   377
 2043  011051' 377                               .BYTE   377
 2044  011052' 377                               .BYTE   377
 2045  011053' 377                               .BYTE   377
 2046  011054' 377                               .BYTE   377
 2047  011055' 014     040600  052503          .ASCII  <014><200>/ACU/          ;RPER2 - BYTE 1
 2048  011062' 020004  046120     125          .ASCII  <004><040>/PLU/
 2049  011067' 015     031420  053060          .ASCII  <015><020>/3OVU/
       011074' 125
 2050  011075' 004     044410  042530          .ASCII  <004><010>/IXE/
 2051  011102' 002004  044116     123          .ASCII  <004><004>/NHS/
```

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2052  011107'    004  046402  051510          .ASCII  <004><002>/MHS/
2053  011114'  000404  051127     125          .ASCII  <004><001>/WRU/
2054  011121'     376                          .BYTE   376
2055  011122'  100024  041101     123          .ASCII  <024><200>/ABS/          ;RPER2 - BYTE 0
2056  011127'     014  043200  047105          .ASCII  <014><200>/FEN/
2057  011134'  040004  052524     106          .ASCII  <004><100>/TUF/
2058  011141'     004  052040  043104          .ASCII  <004><040>/TDF/
2059  011146'  010024  040522     127          .ASCII  <024><020>/RAW/
2060  011153'     014  046420  042523          .ASCII  <014><020>/MSE/
2061  011160'  004004  051503     125          .ASCII  <004><010>/CSU/
2062  011165'     004  053404  052523          .ASCII  <004><004>/WSU/
2063  011172'  001004  051503     106          .ASCII  <004><002>/CSF/
2064  011177'     004  053401  052503          .ASCII  <004><001>/WCU/
2065  011204'     377                          .BYTE   377
2066  011205'     005  047600  054503          .ASCII  <005><200>/OCYL/         ;RPER3 - BYTE 1
      011212'     114
2067  011213'     004  051500  044513          .ASCII  <004><100>/SKI/
2068  011220'  020024  050117     105          .ASCII  <024><040>/OPE/
2069  011225'     376                          .BYTE   376
2070  011226'  040004  041504     114          .ASCII  <004><100>/DCL/          ;RPER3 - BYTE 0
2071  011233'     004  040440  046103          .ASCII  <004><040>/ACL/
2072  011240'  004014  053525     122          .ASCII  <014><010>/UNR/
2073  011245'     024  053402  047501          .ASCII  <024><002>/WAO/
2074  011252'  001014  052526     106          .ASCII  <014><002>/VUF/
2075  011257'     024  042001  052503          .ASCII  <024><001>/DCU/
2076  011264'  000414  051520     125          .ASCII  <014><001>/PSU/
2077  011271'     377                          .BYTE   377
2078  011272'     377                          .BYTE   377
2079  011273'     377                          .BYTE   377
2080  011274'     377                          .BYTE   377
2081  011275'     044  040600  042520          .ASCII  <044><200>/APE/          ;RPCS3 - BYTE 1 (11/70 ONLY)
2082  011302'  040046  050104  047505          .ASCII  <046><100>/DPEOW/
      011310'     127
2083  011311'     046  042040  042520          .ASCII  <046><040>/DPEEW/
      011316'  053505
2084  011320'  010046  041527  047505          .ASCII  <046><020>/WCEOW/
      011326'     127
2085  011327'     046  053410  042503          .ASCII  <046><010>/WCEEW/
      011334'  053505
2086  011336'     000                          .BYTE   0                        ;TABLE TERMINATOR
2087       011340'                             .EVEN
```

```
                                        .SBTTL  SUBROUTINES FOR RP04/RP05/RP06 DEVICE ROUTINE


                                        ;SAVE REGISTERS R0 THRU R5

                                                ;JSR    R0,SAVREG       S/R CALL

011340' 010146                  SAVREG: MOV     R1,-(SP)                ;SAVE R0 THRU R5
011342' 010246                          MOV     R2,-(SP)
011344' 010346                          MOV     R3,-(SP)
011346' 010446                          MOV     R4,-(SP)
011350' 010546                          MOV     R5,-(SP)
011352' 010007                          MOV     R0,PC                   ;EXIT IN-LINE


                                        ;RESTORE REGISTERS R0 THRU R5

                                                ;JSR    R0,RESREG       S/R CALL

011354' 005726                  RESREG: TST     (SP)+                   ;RESTORE R5 THRU R0
011356' 012605                          MOV     (SP)+,R5
011360' 012604                          MOV     (SP)+,R4
011362' 012603                          MOV     (SP)+,R3
011364' 012602                          MOV     (SP)+,R2
011366' 012601                          MOV     (SP)+,R1
011370' 000200                          RTS     R0                      ;EXIT IN-LINE


                                        ;SET PROGRAM'S PROG TABLE ADR IN R3 & RPCS1 ADR IN R4

                                                ;JSR    PC,SUPTAD       S/R CALL

011372' 010703                  SUPTAD: MOV     PC,R3                   ;SET UP LOCATION ZERO ADR
011374' 062703  166404                  ADD     #LOCZ-.,R3
011400' 166303  177776                  SUB     -2(R3),R3               ;SUBTRACT PROG TBL LENGTH
011404' 016704  166414                  MOV     DREGAD,R4               ;GET DEV REG BASE ADR
011410' 000207                          RTS     PC                      ;EXIT IN-LINE


                                        ;STORE DEVICE'S STATUS REGISTERS

                                                ·JSR    R5,STSTAT       S/R CALL
                                                  WORD  STADR-.         REL STORAGE ADR
                                                ;DESTROYS R0,R1,R2

011412' 010501                  STSTAT: MOV     R5,R1                   ;GET REL STORAGE ADR & MAKE
011414' 062501                          ADD     (R5)+,R1                ;IT ABSOLUTE
011416' 016700  156402                  MOV     DREGAD,R0               ;GET DEV REG ADR
011422' 010046                          MOV     R0,-(SP)                ;SET UP ADR OF RPCS2 REG
011424' 062716  000010                  ADD     #RPCS2,(SP)             ;FOR LATER USE
011430' 012702  005011                  MOV     #5011,R2                ;SET UP TWO LOOP COUNTS
011434' 032777  000010  166422          BIT     #CPU70,@CSYSFW          ;RUNNING ON AN 11/70?
011442' 001402                          BEQ     10$                     ;Y,N-10$
011444' 062702  001000                  ADD     #1000,R2                ;ALLOW FOR 2 MORE REGS
011450' 012021                  10$:    MOV     (R0)+,(R1)+             ;STORE DEV REG
```

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2145  011452' 105302                      DECB    R2                      ;FINISHED WITH THIS GROUP OF REGS?
2146  011454' 001375                      BNE     10$                     ;Y,N-10$
2147  011456' 000302                      SWAB    R2                      ;SET UP NEXT LOOP CNT
2148  011460' 001417                      BEQ     30$                     ;DONE 2 PASSES? (N,Y-30$)
2149  011462' 010746                      MOV     PC,-(SP)                ;SET UP CURRENT STATUS
2150  011464' 062716  170524              ADD     #CSTAT-.,(SP)           ;STORAGE ADR
2151  011470' 020126                      CMP     R1,(SP)+                ;STORING STATUS FOR INTERRUPT?
2152  011472' 101005                      BHI     15$                     ;Y,N-15$
2153  011474' 032736  000200              BIT     #200,@(SP)+             ;OUTPUT READY SET IN RPCS2?
2154  011500' 001403                      BEQ     20$                     ;Y,N-20$
2155  011502' 012021                      MOV     (R0)+,(R1)+             ;STORE RPDB'S CONTENTS
2156  011504' 000761                      BR      10$                     ;GO DO SECOND PASS
2157  011506' 005726              15$:    TST     (SP)+                   ;TAKE UNUSED ADR OFF STACK
2158  011510' 062700  000002      20$:    ADD     #2,R0                   ;BYPASS READ C  RPDB
2159  011514' 005021                      CLR     (R1)+                   ;SET ITS STORAGE TO 0'S
2160  011516' 000754                      BR      10$                     ;GO DO SECOND PASS
2161  011520' 000205              30$:    RTS     R5                      ;EXIT IN-LINE
2162
2163
2164                                      ;DISPLAY DEVICE I.D. & UNIT #
2165
2166                                              ;JSR    PC,DEVID        S/R CALL
2167
2168                                              ;R3 MUST CONTAIN PROG TBL ADR
2169                                              ;DESTROYS R0,R1,R2
2170
2171  011522' 012700  032060      DEVID:  MOV     #"04,R0                 ;INITIALIZE TO RP04
2172  011526' 032763  000060  000032      BIT     #60,PMDLCD(R3)          ;IS THIS AN RP04?
2173  011534' 001410                      BEQ     10$                     ;N,Y-10$
2174  011536' 012700  032460              MOV     #"05,R0                 ;SET UP FOR AN RP05
2175  011542' 032763  000020  000032      BIT     #20,PMDLCD(R3)          ;IS IT AN RP05?
2176  011550' 001002                      BNE     10$                     ;N,Y-10$
2177  011552' 012700  033060              MOV     #"06,R0                 ;MUST BE AN RP06
2178  011556' 010067  000532      10$:    MOV     R0,UNITMG+6             ;TAILOR DEV I.D. MSG
2179  011562' 012767  000026  000056      MOV     #22.,DEVIML             ;INITIALIZE TO NORMAL MSG LNGTH
2180  011570' 116300  000035              MOVB    PCURDV(R3),R0           ;GET CURR UNIT #
2181  011574' 020027  000007              CMP     R0,#7                   ;VALID UNIT #?
2182  011600' 101007                      BHI     DEVIIV                  ;Y,N-DEVIIV
2183  011602' 004577  166252              JSR     R5,@BTASLZ              ;CONVERT # TO DECIMAL ASCII
2184  011606' 000524                      .WORD   UNASCI-.
2185  011610' 016767  000522  000514      MOV     UNASCI+4,UNASCI         ;MOVE ASCII # TO 1ST TWO DIGITS
2186  011616' 000410                      BR      DEVIPR                  ;GO ISSUE MSG
2187  011620' 012767  000032  000020  DEVIIV: MOV  #26.,DEVIML            ;SET UP ERR COND MSG LNGTH
2188  011626' 042700  177400              BIC     #177400,R0              ;RESET HIGH BYTE
2189  011632' 004577  166220              JSR     R5,@BINASC              ;CONVERT BINARY # TO ASCII
2190  011636' 000474                      .WORD   UNASCI-.
2191  011640' 004567  000256      DEVIPR: JSR     R5,PRINT                ;GO ISSUE UNIT # MSG
2192  011644' 000442                      .WORD   UNITMG-.
2193  011646' 000026              DEVIML: .WORD   22.
2194  011650' 000207                      RTS     PC                      ;EXIT IN-LINE
```

```
                                        ;TAILOR STATUS MSG & PRINT IT
                                        ;
                                        ;JSR    R5,DISPST       S/R CALL
                                        ;WORD   STATADR-.       REL ADR OF STATUS DATA
                                        ;DESTROYS R0,R1,R2
                                        ;
011652' 010346          DISPST: MOV     R3,-(SP)                ;SAVE R3
011654' 010503                  MOV     R5,R3                   ;GET REL DATA ADR
011656' 062503                  ADD     (R5)+,R3                ;MAKE IT ABS
011660' 010546                  MOV     R5,-(SP)                ;SAVE R5
011662' 010705                  MOV     PC,R5                   ;SET UP ADR OF REG NAMES IN ASCII
011664' 062705  166232          ADD     #DVREGS-.,R5
011670' 012746  000024          MOV     #20.,-(SP)              ;SET UP # OF REGISTERS TO DISPLAY
011674' 032777  000010  166162  BIT     #CPU70,@CSYSFW          ;RUNNING ON AN 11/70?
011702' 001402                  BEQ     10$                     ;Y,N-10$
011704' 062716  000002          ADD     #2,(SP)                 ;MAKE IT 22 REGISTERS
011710' 012700  000003  10$:    MOV     #3,R0                   ;SET UP 3 REG LOOP CNT
011714' 010701                  MOV     PC,R1                   ;POINT AT REG NAME IN MSG
011716' 062701  000422          ADD     #DVRGMG-.,R1
011722' 012521          15$:    MOV     (R5)+,(R1)+             ;MOVE REG NAME TO MSG
011724' 012521                  MOV     (R5)+,(R1)+
011726' 005725                  TST     (R5)+                   ;POINT TO NEXT NAME
011730' 062701  000012          ADD     #10.,R1                 ;POINT TO NEXT FIELD IN MSG
011734' 005300                  DEC     R0                      ;DONE 3 REGS?
011736' 001371                  BNE     15$                     ;Y,N-15$
011740' 012300                  MOV     (R3)+,R0                ;CONVERT OCTAL REGISTER CONTENTS
011742' 004577  166110          JSR     R5,@#INASC              ;FOR 3 REGISTERS TO ASCII
011746' 000400                  .WORD   DVRDT1-.                ;AND PLACE IN THE MSG
011750' 012300                  MOV     (R3)+,R0
011752' 004577  166100          JSR     R5,@#INASC
011756' 000406                  .WORD   DVRDT2-.
011760' 012300                  MOV     (R3)+,R0
011762' 004577  166070          JSR     R5,@#INASC
011766' 000414                  .WORD   DVRDT3-.
011770' 012767  000050  000034  MOV     #40.,30$                ;INITIALIZE MSG LENGTH TO 3 REGS
011776' 162716  000003          SUB     #3,(SP)                 ;DECR REGISTER CNT
012002' 100005                  BPL     25$                     ;< 3 REGS? (Y,N-25$)
012004' 162767  000016  000020  20$:    SUB     #14.,30$        ;SHORTEN MSG LENGTH BY 1 REG
012012' 005216                  INC     (SP)                    ;INCR NEG REG CNT
012014' 100773                  BMI     20$                     ;CNT BACK TO 0? (Y,N-20$)
012016' 010346          25$:    MOV     R3,-(SP)                ;SAVE REG DATA PNTR
012020' 016603  000006          MOV     6(SP),R3                ;RESTORE PROG TBL ADR
012024' 004567  000072          JSR     R5,PRINT                ;GO PRINT THE MSG
012030' 000310                  .WORD   DVRGMG-.
012032' 000050          30$:    .WORD   40.
012034' 012603                  MOV     (SP)+,R3                ;RESTORE REG DATA PNTR
012036' 005716                  TST     (SP)                    ;MORE REGS TO GO?
012040' 001323                  BNE     10$                     ;N,Y-10$
012042' 005726                  TST     (SP)+                   ;REMOVE CNT FROM STACK
012044' 012605                  MOV     (SP)+,R5                ;RESTORE R5 & R3
012046' 012603                  MOV     (SP)+,R3
012050' 000205                  RTS     R5                      ;EXIT IN-LINE
```

```
                                        ;DISPLAY CYL/HEAD/SECT WORDS' VALUES
                                        ;
                                                ;JSR    PC,PRTIWD       S/R CALL
                                                ;DESTROYS R0,R1,R2
                                        ;
012052' 016700  165726          PRTIWD: MOV     CYL,R0                  ;GET CYL VALUE
012056' 004577  165774                  JSR     R5,@BINASC              ;CONVERT ITS VALUE TO ASCII
012062' 001045                          .WORD   IFCYL-.
012064' 016700  165716                  MOV     HEAD,R0                 ;GET & CONVERT HEAD VALUE
012070' 004577  165762                  JSR     R5,@BINASC
012074' 001050                          .WORD   IFHEAD-.
012076' 016700  165706                  MOV     SECT,R0                 ;GET & CONVERT SECT VALUE
012102' 004577  165750                  JSR     R5,@BINASC
012106' 001053                          .WORD   IFSECT-.
012110' 004567  000006                  JSR     R5,PRINT                ;PRINT MSG WITH THEIR VALUES
012114' 001006                          .WORD   INFOMG-.
012116' 000045                          .WORD   37.
012120' 000207                          RTS     PC                      ;EXIT IN-LINE
                                        ;
                                        ;ISSUE MSG TO LIST DEVICE SUBROUTINE
                                        ;
                                                ;JSR    R5,PRINT        S/R CALL
                                                ;.WORD  MSGADR-.        REL ADR OF MSG
                                                ;.WORD  BYTCNT          MSG BYTE CNT (IF NEGATIVE,
                                                ;                         RESET PRT DEV DEDICATED.)
                                                ;R3 = PROG TBL ADR
                                                ;R4 = FLAGWORD -- IF NEGATIVE, USE CMND MODE PRINT
                                                ;DESTROYS R0,R1,R2
                                        ;
012122' 010500                  PRINT:  MOV     R5,R0                   ;GET MSG ADR & MAKE IT ABS
012124' 062500                          ADD     (R5)+,R0
012126' 012501                          MOV     (R5)+,R1                ;GET BYTE COUNT
012130' 005704                          TST     R4                      ;USE CMND MODE PRINT?
012132' 100030                          BPL     40$                     ;Y,N-40$
012134' 010702                          MOV     PC,R2                   ;SET UP LINK INFO ADR
012136' 062702  000040                  ADD     #20$-.,R2
012142' 160200                          SUB     R2,R0                   ;MAKE MSG ADR REL
012144' 010022                          MOV     R0,(R2)+                ;STORE MSG ADR
012146' 010112                          MOV     R1,(R2)                 ;STORE MSG'S BYTE COUNT
012150' 100001                          BPL     10$                     ;CNT NEG? (Y,N-10$)
012152' 005412                          NEG     (R2)                    ;MAKE IT POSITIVE
012154' 016367  000006  000056  10$:    MOV     PASCIN(R3),PROGNM       ;STORE PROG'S # IN MSG
012162' 004577  165666                  JSR     R5,@CLIST               ;ISSUE PROG #
012166' 000050                          .WORD   PNMMSG-.
012170' 000005                          .WORD   5
012172' 004577  165656                  JSR     R5,@CLIST               ;ISSUE MSG SPECIFIED
012176' 000000                  20$:    .WORD   XXXX
012200' 000000                          .WORD   XXXX
012202' 004577  165646                  JSR     R5,@CLIST               ;ISSUE A <CR> & <LF>
012206' 000254                          .WORD   CRLF-.
012210' 000002                          .WORD   2
012212' 000410                          BR      PRTEX                   ;GO TO EXIT
012214' 010067  000010          40$:    MOV     R0,50$                  ;STORE MSG'S ABS ADR
012220' 010167  000006                  MOV     R1,60$                  ;STORE ITS BYTE CNT
012224' 004577  165622                  JSR     R5,@ULIST               ;GO TO MPG TO ISSUE THE MSG
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```
2305  012230' 000000                  50$:    .WORD   XXXX
2306  012232' 000000                  60$:    .WORD   XXXX
2307  012234' 000205                  PRTEX:  RTS     R5                      ;EXIT IN-LINE
```

```
2309                                                .SBTTL  RP04/RP05/RP06 MESSAGE STORAGE AREA
2310
2311
2312                                                .NLIST  BEX
2313
2314                                                .EVEN
2315  012236' 021520                        PNMMSG: .ASCII  /P#/
2316  012240' 054130      011               PROGNM: .ASCII  /XX/<011>
2317  012243'     101  020124  040514       ATIMSG: .ASCII  /AT LAST INT:/
2318  012257'     103  051125  042522       CURMSG: .ASCII  /CURRENTLY:/
2319  012271'     105  042116  047440       RENDMG: .ASCII  /END OF REPORT/
2320                                                .EVEN
2321  012306' 025052  025052  050122       UNITMG: .ASCII  /****RPXX DISK UNIT: /
2322  012332' 054130  054130  054130       UNASCI: .ASCII  /XXXXXX/
2323                                                .EVEN
2324  012340' 054130  054130  020075       DVRGMG: .ASCII  /XXXX= /
2325  012346' 054130  054130  054130       DVRDT1: .ASCII  /XXXXXX  XXXX= /
2326  012364' 054130  054130  054130       DVRDT2: .ASCII  /XXXXXX  XXXX= /
2327  012402' 054130  054130  054130       DVRDT3: .ASCII  /XXXXXX/
2328  012410' 054502  042524  035123       CNTSMG: .ASCII  /BYTES:  RD= /
2329  012424' 054130  054130  054130       BCMRD:  .ASCII  /XXXXXXXXXXXX  WR= /
2330  012446' 054130  054130  054130       BCMWR:  .ASCII  /XXXXXXXXXXXX/
2331  012462' 005015                        CRLF:   .ASCII  <015><012>
2332  012464' 004411  045503  020075                .ASCII  <011><011>/CK= /
2333  012472' 054130  054130  054130       BCMCK:  .ASCII  /XXXXXXXXXXX/<015><012><011>/CMNDS:  RD= /
2334  012525'     130  054130  054130       CMDCRD: .ASCII  /XXXXXX WR= /
2335  012540' 054130  054130  054130       CMDCWR: .ASCII  /XXXXXX CK= /
2336  012553'     130  054130  054130       CMDCCK: .ASCII  /XXXXXX/<015><012><011><011>/SK= /
2337  012571'     130  054130  054130       CMDCSK: .ASCII  /XXXXXX MISC= /
2338  012606' 054130  054130  054130       CMDCMS: .ASCII  /XXXXXX/<015><012><011>/ERRORS: DEV= /
2339  012634' 054130  054130  054130       CNTERR: .ASCII  /XXXXXX CORR ECC= /
2340  012655'     130  054130  054130       CNTCEC: .ASCII  /XXXXXX DATA= /
2341  012672' 054130  054130  054130       CNTDER: .ASCII  /XXXXXX/<015><012><011>/RETRYS: DLT= /
2342  012720' 054130  054130  054130       CNTDLT: .ASCII  /XXXXXX DTE= /
2343  012734' 054130  054130  054130       CNTDTE: .ASCII  /XXXXXX HCRC= /
2344  012751'     130  054130  054130       CNTHCR: .ASCII  /XXXXXX/<015><012><011><011>/FER= /
2345  012770' 054130  054130  054130       CNTFER: .ASCII  /XXXXXX HCE= /
2346  013004' 054130  054130  054130       CNTHCE: .ASCII  /XXXXXX DCK= /
2347  013020' 054130  054130  054130       CNTDCK: .ASCII  /XXXXXX/<015><012><011><011>/WCE= /
2348  013037'     130  054130  054130       CNTWCE: .ASCII  /XXXXXX/<015><012><011>/TOTAL RETRYS: /
2349  013066' 054130  054130  054130       CNTRTY: .ASCII  /XXXXXX/<015><012><011>/INTERRUPTS:  /
2350  013114' 054130  054130  054130       CNTINT: .ASCII  /XXXXXX/
2351          013122'                       CNTSEN= .
2352  013122' 054503  036514      040       INFOMG: .ASCII  /CYL= /
2353  013127'     130  054130  054130       IFCYL:  .ASCII  /XXXXXX HEAD= /
2354  013144' 054130  054130  054130       IFHEAD: .ASCII  /XXXXXX SECT= /
2355  013161'     130  054130  054130       IFSECT: .ASCII  /XXXXXX/
2356          013170'                               .EVEN
2357  013170' 052123  047115  020124       STMNMG: .ASCII  /STMNT # /
2358  013200' 054130  054130  054130       STMNUM: .ASCII  /XXXXXX/
2359  013206' 051105  047522  020122       DKEMSG: .ASCII  /ERROR BITS:/<015><012><011>
2360  013224' 000100                        CODFLD: .BLKB   64.
2361  013324' 042502  047506  042522       BEFIO:  .ASCII  'BEFORE ISSUING I/O CMND:'
2362  013354' 043101  042524  020122       AFTIO:  .ASCII  'AFTER ISSUING I/O CMND:'
2363  013403'     124  047457  047440       CRTO:   .ASCIZ  'T/O ON CRESET'
2364  013421'     124  046511  047505       IOTO:   .ASCIZ  'TIMEOUT ON I/O'
```

```
2365  013440'  027524  020117  047117  ACQTO:  .ASCIZ  'T/O ON DISK ACQUIRE'
2366  013464'  047516  026516  054105  NONEXD: .ASCIZ  'NON-EXISTENT DRIVE'
2367  013507'     125  051516  043101  INITUS: .ASCII  'U SAFE '
2368  013516'  051105  047522  020122  INITDE: .ASCIZ  'ERROR ON INITIATION'
2369  013542'  044504  045523  044440  OFFLIN: .ASCIZ  'DISK IS OFF-LINE'
2370  013563'     104  051120  047040  DPNSET: .ASCIZ  'DPR NOT SET'
2371  013577'     116  047117  044455  NOITER: .ASCII  'NON-INT '
2372  013607'     111  047457  052040  IOTERM: .ASCIZ  'I/O TERMINATION ERROR'
2373  013635'     111  052116  053440  NOATA:  .ASCIZ  'INT WITHOUT ATA'
2374  013655'     125  042516  050130  UXPATA: .ASCIZ  'UNEXP ATA COND'
2375  013674'  054105  040510  051525  RTYEXH: .ASCIZ  'EXHAUSTED RETRIES'
2376  013716'  047111  020126  041505  INVPAT: .ASCIZ  'INV ECC BIT PATTERN'
2377  013742'  047111  020126  041505  INVPOS: .ASCIZ  'INV ECC BIT POSITION'
2378  013767'     111  053116  052440  INVDVN: .ASCIZ  /INV UNIT #/
2379                                    .EVEN
2380                                    .LIST   BEX
2381
2382          014002'                 DVREND= .
```

```
                                .SBTTL  FORMATS FOR PROGRAM & DEVICE ROUTINE TABLES

                        ;       PROGRAM TABLE FORMAT

000242                  PTLGTH= 162.    ;PROGRAM TABLE LENGTH - NON MEM MGMNT VERSION OF MPG

                        ;(PTLGTH= 212.  ;PROGRAM TABLE LENGTH - MEM MGMNT VERSION OF MPG)

000000                  PFLGWD= +0.     ;PROGRAM FLAG WORD - 1 WORD

000002                          URSTOP= 2       ; 1 = USER HAS STOPPED THIS PROGRAM
000004                          ERSTOP= 4       ; 1 = AN ERROR HAS STOPPED THIS PROGRAM
000010                          WT4IOT= 10      ; 1 = WAITING FOR I/O TERMINATION
000020                          CTPRIO= 20      ; 1 = CONSOLE OR PRINTER I/O IN PROGRESS
000040                          SETDED= 40      ; 1 = THIS PROG SET THE PRT DEV DEDICATED FLAG
000100                          OCPRES= 100     ; 1 = OBJ CODE IS PRESENT
000200                          USEUBM= 200     ; 1 = THIS PROG USES THE UNIBUS MAP (MEM MGMNT ONLY)
100000                          ACTIVE= 100000  ; 1 = PROGRAM IS ACTIVE (SPECIFIED FOR EXECUTION)

000002                  POPSW=  +2.     ;PROGRAM'S OPERATION SWITCHES - 1 WORD

100000                          STONER= 100000  ; 1 = STOP PROG EXECUTION UPON ERROR
040000                          CYCPRG= 40000   ; 1 = CYCLE PROGRAM (ON CURRENT DEVICE)
020000                          PRONER= 20000   ; 1 = DO NOT PRINT ON ERROR
010000                          BIT12=  10000   ; 0 = NOT USED
004000                          BIT11=  4000    ; 0 = NOT USED
002000                          CYCDVL= 2000    ; 1 = CYCLE THE DEVICE LIST
001000                          GTNXTD= 1000    ; 1 = CYCLE ON SAME DEVICE UPON ERROR
000400                          DOERCK= 400     ; 1 = DON'T DO ERROR CHECKING
000200                          SPOPER= 200     ; 1 = DEVICE SPECIAL OPERATION
000100                          BIT6=   100     ; 0 = NOT USED
000040                          DOIOT=  40      ; 1 = DO NOT PERFORM I/O TIMEOUT
000020                          AUTORP= 20      ; 1 = DO NOT AUTOMATICALLY DISPLAY COUNTS
000010                          AURPEP= 10      ; 1 = AUTO DISPLAY COUNTS AT END OF FINAL PASS ONLY
000004                          HSKPEP= 4       ; 1 = HOUSEKEEP COUNTS ONLY AT RUN COMMAND
000002                          PFBBOV= 2       ; 1 = PRINT FIRST BAD BYTE ONLY ON VERIFY
000001                          NOCOMP= 1       ; 1 = DO NOT PRINT PROG COMPLETED MSG

000004                  PFWADR= +4.     ;*;PROGRAM FLAGWORD ADDRESS - 1 WORD

000006                  PASCIN= +6.     ;PROGRAM'S NUMBER IN ASCII - 1 WORD

000010                  PNAME=  +8.     ;PROGRAM'S NAME IN ASCII - 6 BYTES

000016                  PRDIOA= +14.    ;ADDRESS OF READ I/O AREA - 1 WORD

000020                  PWRIOA= +16.    ;ADDRESS OF WRITE I/O AREA - 1 WORD

000022                  PSRCST= +18.    ;SOURCE STATEMENTS START ADDRESS - 1 WORD

000024                  POBJST= +20.    ;OBJECT CODE START ADDRESS - 1 WORD

000026                  PLNGTH= +22.    ;PROG AREA LENGTH (OBJ END MINUS PROG TBL START) - 1 WORD

000030                  PTOCNT= +24.    ;I/O TIMEOUT COUNT - 1 WORD
```

```
                000032          PMDLCD= +26.    ;DEV ROUT MODEL # CODE - 1 WORD
                000034          PDPNTR= +28.    ;CURRENT DEVICE NUMBER POINTER - 1 BYTE
                000035          PCURDV= +29.    ;CURRENT DEVICE # - 1 BYTE
                000036          PDNUMS= +30.    ;DEVICE NUMBERS - 16 BYTES
                000056          PTEM0=  +46.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000060          PTEM1=  +48.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000062          PTEM2=  +50.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000064          PTEM3=  +52.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000066          PTEM4=  +54.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000070          PTEM5=  +56.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000072          PTEM6=  +58.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000074          PTEM7=  +60.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000076          PTEM8=  +62.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000100          PTEM9=  +64.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000102          PTEM10= +66.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000104          PTEM11= +68.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000106          PTEM12= +70.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000110          PTEM13= +72.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000112          PTEM14= +74.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000114          PTEM15= +76.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
                000116          PNBR=   +78.    ;NUMBER OF BYTES TO TRANSFER ON MOVE (NBR) - 1 WORD
                000120          PSRC=   +80.    ;DATA SOURCE ADDRESS ON MOVE (SRC) - 1 WORD
                000122          PDST=   +82.    ;DATA DESTINATION ADDRESS ON MOVE (DST) - 1 WORD
                000124          PSTKCT= +84.    ;# OF WORDS (X 2) SAVED OFF STACK - 1 WORD
                000126          PSTKSV= +86.    ;STACK WORDS STORAGE AREA - 30 WORDS
                000222          PSVREG= +146.   ;USER'S R0 THRU R5 REGISTERS STORAGE AREA - 6 WORDS
                000236          PUSRPC= +158.   ;USER'S CURRENT PROGRAM COUNTER - 1 WORD
```

```
                                        ;FOLLOWING ENTRIES (PRDIOX THRU PUBMAP) ARE ONLY IN MEM MGMNT VERSION
                                ;(PRDIOX= +160. ;18/22 BIT ABSOLUTE ADDRESS OF READ I/O AREA - 2 WORDS)
                                ;(PRDIOV= +164. ;18 BIT VIRTUAL ADDRESS OF READ I/O AREA - 2 WORDS)
                                ;(PWRIOX= +168. ;18/22 BIT ABSOLUTE ADDRESS OF WRITE I/O AREA - 2 WORDS)
                                ;(PWRIOV= +172. ;18 BIT VIRTUAL ADDRESS OF WRITE I/O AREA - 2 WORDS)
                                ;(PUPARS= +176. ;STORAGE AREA FOR USER'S PAR'S 0 THRU 7 - 8 WORDS)
                                ;(PUPDRS= +192. ;STORAGE AREA FOR USER'S PDR'S 0 THRU 7 - 8 WORDS)
                                ;(PUBMAP= +208. ;1ST UNIBUS MAP REG # AND # OF REGS USED - 1 WORD)
                                        ;END OF MEM MGMNT ONLY ENTRIES

000240                          PTSIZE= +160.   ;PROGRAM TABLE SIZE IN BYTES - 1 WORD - NON MEM MGMNT
                                ;(PTSIZE= +210. ;PROGRAM TABLE SIZE IN BYTES - 1 WORD - MEM MGMNT VERSION)

000242                          PTEND=  +162.   ;END OF PROGRAM TABLE - NON MEM MGMNT VERSION
                                ;(PTEND=  +212. ;END OF PROGRAM TABLE - MEM MGMNT VERSION
```

```
                                ;       DEVICE ROUTINE TABLE
                                ;
000116                          DRTLTH= 78.     ;DEVICE ROUTINE TABLE LENGTH
                                ;
000000                          DEVRSZ= +0.     ;DEVICE ROUTINE SIZE IN BYTES - 1 WORD
000002                          DEVFWD= +2.     ;DEVICE ROUTINE FLAGWORD - 1 WORD
000004                          DEVIW1= +4.     ;DEVICE INTERFACE WORD # 1 - 1 WORD
000006                          DEVIW2= +6.     ;DEVICE INTERFACE WORD # 2 - 1 WORD
000010                          DEVIW3= +8.     ;DEVICE INTERFACE WORD # 3 - 1 WORD
000012                          DEVIW4= +10.    ;DEVICE INTERFACE WORD # 4 - 1 WORD
000014                          DEVIW5= +12.    ;DEVICE INTERFACE WORD # 5 - 1 WORD
000016                          DEVIW6= +14.    ;DEVICE INTERFACE WORD # 6 - 1 WORD
000020                          DEVIW7= +16.    ;DEVICE INTERFACE WORD # 7 - 1 WORD  (SIZE)
000022                          DEVIW8= +18.    ;DEVICE INTERFACE WORD # 8 - 1 WORD  (ERR)
000024                          DEVDRA= +20.    ;DEVICE REGISTERS ADDRESS - 1 WORD
000026                          DEVIVA= +22.    ;DEVICE INTERRUPT VECTOR ADDRESS - 1 WORD
000030                          DEVRPS= +24.    ;DEVICE READ PROCESSOR STATUS WORD (BUS REQ) - 1 WORD
000032                          DEVWPS= +26.    ;DEVICE WRITE PROC STATUS WORD (BUS REQ) - 1 WORD
000034                          DHKPAD= +28.    ;DEVICE ROUT HOUSEKEEPING ROUT REL ENTRY ADR - 1 WORD
000036                          DERPAD= +30.    ;DEVICE ROUT REPORT ROUT REL ENTRY ADR - 1 WORD
000040                          DKILAD= +32.    ;DEVICE ROUT KILL ROUTINE REL ENTRY ADR - 1 WORD
000042                          DECTAD= +34.    ;DEVICE ROUT ERROR COUNTER REL ADR - 1 WORD
000044                          DTOEAD= +36.    ;DEVICE ROUT TIMEOUT ERR ROUT REL ENTRY ADR - 1 WORD
000046                          DEVIOB= +38.    ;DEVICE I/O BUSY BRANCH ADDRESS (CIOBSY) - 1 WORD
000050                          DEVDER= +40.    ;DEVICE ERROR BRANCH ADDRESS (CUPGER) - 1 WORD
000052                          DVUPRT= +42.    ;USER MODE PRINT BRANCH ADDRESS (ULIST) - 1 WORD
000054                          DVCPRT= +44.    ;CMND MODE PRINT BRANCH ADDRESS (CLIST) - 1 WORD
000056                          DEVBTA= +46.    ;CONVERT BINARY TO ASCII BR ADR (BINASC) - 1 WORD
000060                          DVBTDA= +48.    ;CONVERT BINARY TO DECIMAL ASCII BR ADR (BTASLZ) - 1 WORD
```

```
2577            000062                  DVPDTA= +50.    ;CONVERT PACKED DECIMAL TO ASCII BR ADR (DECASC) - 1 WORD
2578
2579            000064                  DVSFWD= +52.    ;MPG SYSTEM FLAGWORD ADDRESS (CSYSFW) - 1 WORD
2580
2581            000066                  DVSVEC= +54.    ;SET INTERRUPT VECTOR BR ADR (SETVEC) - 1 WORD
2582
2583            000070                  DVCVEC= +56.    ;CLEAR INTERRUPT VECTOR BR ADR (CLRVEC) - 1 WORD
2584
2585            000072                  DVTVEC= +58.    ;TEST INTERRUPT VECTOR BR ADR (TSTVEC) - 1 WORD
2586
2587            000074                  DVRINT= +60.    ;RETURN FROM INTERRUPT BR ADR (RTNINT) - 1 WORD
2588
2589            000076                  DVGETB= +62.    ;GET DATA BYTE BR ADR (GETBYT) - 1 WORD
2590
2591            000100                  DVPUTB= +64.    ;PUT DATA BYTE BR ADR (PUTBYT) - 1 WORD
2592
2593            000102                  DEVSTP= +66.    ;DEVICE ROUT REL SYMBOL TABLE POINTER - 1 WORD
2594
2595            000104                  DEVETP= +68.    ;DEVICE ROUT REL ENTRY TABLE POINTER - 1 WORD
2596
2597            000106                  DVPTEP= +70.    ;PACK TABLE EXTEN. REL POINTER - 1 WORD
2598
2599            000110                  DVVTEP= +72.    ;VECTOR TABLE EXTEN. REL POINTER - 1 WORD
2600
2601            000112                  DVCTEP= +74.    ;COMPILER TBL EXTEN. REL POINTER - 1 WORD
2602
2603            000114                  DVIWSP= +76.    ;DEVICE INTERFACE WORD SYMBOL TBL REL POINTER - 1 WORD
2604
2605            000116                  DRTEND= +78.    ;END OF DEVICE ROUTINE TABLE
2606
2607
2608            000001                  .END
```

DTRPAB.P11 SYMBOL TABLE

```
ACQEAD  005114R  002   CNTCEC  012655R  002   DEVIPR  011640R  002   DVRENO= 014002R  002   INITDE  013516R  002
ACQERC  005116R  002   CNTDCK  013020R  002   DEVIVA= 000026          DVREX   003006R  002   INITUS  013507R  002
ACQERR  005104R  002   CNTDER  012672R  002   DEVIW1= 000004          DVRGMG  012340R  002   INTCNT  002340R  002
ACQGDK  005126R  002   CNTDLT  012720R  002   DEVIW2= 000006          DVRINT= 000074          INTEAD  007576R  002
ACQHSK  004412R  002   CNTDTE  012734R  002   DEVIW3= 000010          DVSFWO= 000064          INTEX   006232R  002
ACQIAD  004656R  002   CNTERR  012634R  002   DEVIW4= 000012          DVSVEC= 000066          INVDVN  013767R  002
ACQRTY  004414R  002   CNTFER  012770R  002   DEVIW5= 000014          DVTVEC= 000072          INVPAT  013716R  002
ACQTO   013440R  002   CNTHCE  013004R  002   DEVIW6= 000016          DVUPRT= 000052          INVPOS  013742R  002
ACTIVE= 100000         CNTHCR  012751R  002   DEVIW7= 000020          DVVTEP= 000110          IOERR = 000001
AFTIO   013354R  002   CNTINT  013114R  002   DEVIWB= 000022          EBSBAS  010136R  002   IOTERM  013607R  002
ANYIOI= 000200         CNTNUM= 000027          DEVRPS= 000030          EBSTAT  010140R  002   IOTO    013421R  002
APORT   003666R  002   CNTRTY  013066R  002   DEVRSZ= 000000          ECI   = 004000          ISTAT = 002134R  002
ATA   = 100000         CNTSEN= 013122R  002   DEVSTP= 000102          ECIOFF  003736R  002   IVCTAD  000026R  002
ATATBL  005136R  002   CNTSMG  012410R  002   DEVWPS= 000032          ECION   003726R  002   JINTEX  006650R  002
ATIMSG  012243R  002   CNTWCE  013037R  002   DFLGWD  000002R  002   ERCOTB  010472R  002   JSETER  006670R  002
AURPEP= 000010         CODFLD  013224R  002   DHKPAD= 000034          ERMBAS  010104R  002   KILL    003370R  002
AUTORP= 000020         CORFLG= 002000          DISCNT  002706R  002   ERR   = 040000          KILLEX  003420R  002
BAI   = 000010         COROFF  004016R  002   DISPST  011652R  002   ERRADR  002342R  002   KPAR4 = 172350
BAIOFF  003776R  002   CORON   004006R  002   DKEMSG  013206R  002   ERRCNT  002312R  002   KPDR4 = 172310
BAION   003766R  002   COUNTS  002264R  002   DKILAD= 000040          ERRCOM  007744R  002   LOCZ    000000R  002
BCMCK   012472R  002   CPU70 = 000010          DLTCNT  002320R  002   ERRCS   007704R  002   MCPE  = 020000
BCMRD   012424R  002   CRESET  004066R  002   DOCORR  007206R  002   ERRCS1  007712R  002   MISCNT  002310R  002
BCMWR   012446R  002   CRLF    012462R  002   DOERCK= 000400          ERREX   010470R  002   MMVER = 000001
BEFIO   013324R  002   CRTO    013403R  002   DOIOT = 000040          ERRFND  006344R  002   MOL   = 010000
BINASC  000056R  002   CSTAT   002210R  002   DOTERM= 000002          ERRI    000022R  002   MSFMT1  002106R  002
BIT11 = 004000         CSYSFW  000064R  002   DPNSET  013563R  002   ERRIS   007730R  002   MSFMT2  002107R  002
BIT12 = 010000         CTPRIO= 000020          DPR   = 000400          ERRSNM  010410R  002   MSFMT3  002114R  002
BIT6  = 000100         CUPGER  000050R  002   DREGAD  000024R  002   ERSTAD  010402R  002   MSFMT4  002123R  002
BPORT   003676R  002   CURADR  002352R  002   DRSET   004136R  002   ERSTOP= 000004          MSFMT5  002132R  002
BTASLZ  000060R  002   CURCMD  002350R  002   DRTEND= 000116          EVEN    003716R  002   MYATA   005156R  002
BYCK    002274R  002   CURCNT  002356R  002   DRTLTH= 000116          FERCNT  002326R  002   NED   = 010000
BYRD    002264R  002   CURFLG  002346R  002   DTECNT  002322R  002   FINCNT  002342R  002   NOATA   013635R  002
BYWR    002270R  002   CURMSG  012257R  002   DTOEAD= 000044          FMT20   004000R  002   NOCOMP= 000001
CECCER  002314R  002   CURPBC  002360R  002   DVA   = 004000          FMT22   004046R  002   NOICOM  004174R  002
CIOBSY  000046R  002   CURPSW  002370R  002   DVBTDA= 000060          FMT22B= 010000          NOITER  013577R  002
CKCNT   002304R  002   CURRTY  002364R  002   DVCMDS  000322R  002   GETBYT  000076R  002   NONEXD  013464R  002
CKCOM   005272R  002   CYCDVL= 002000          DVCPRT= 000054          GOTDSK  004662R  002   NOWAIT  003656R  002
CKCORR  006674R  002   CYCPRG= 040000          DVCPTE  001454R  002   GTNXTD= 001000          OCPRES= 000100
CKDBSY  007334R  002   CYL     000004R  002   DVCTEP= 000112          HARDER  006654R  002   ODD     003706R  002
CKRTRY  006424R  002   DATAER  002316R  002   DVCVEC= 000070          HCECNT  002330R  002   OFFLIN  013542R  002
CKSC    006242R  002   DCKCNT  002332R  002   DVGETB= 000076          HCI   = 002000          OFFSET  005360R  002
CKUNLD  003212R  002   DECASC  000063R  002   DVIWSP= 000114          HCIOFF  003756R  002   OTHATA  005160R  002
CLIST   000054R  002   DECTAD= 000042          DVIWST  002054R  002   HCION   003746R  002   PAKACK  004152R  002
CLRVEC  000070R  002   DERPAD= 000036          DVMVTE  001230R  002   HCRCNT  002324R  002   PARITY= 000020
CLRWTF  006210R  002   DEVBTA= 000056          DVPDTA= 000062          HEAD    000006R  002   PASCIN= 000006
CMDCCK  012553R  002   DEVDER= 000050          DVPKTE  000560R  002   HSKEEP  002450R  002   PATCH   002400R  002
CMDCMS  012606R  002   DEVDRA= 000024          DVPTEP= 000106          HSKPEN= 002372R  002   PC    =X000007
CMDCOM  005416R  002   DEVETP= 000104          DVPUTB= 000100          HSKPEP= 000004          PCLRDV= 000035
CMDCRD  012525R  002   DEVFWD= 000002          DVRDT1  012346R  002   HSKPST= 002134R  002   PDNUMS= 000036
CMDCSK  012571R  002   DEVID   011522R  002   DVRDT2  012364R  002   IFCYL   013127R  002   PDPNTR= 000034
CMDCWR  012540R  002   DEVIIV  011620R  002   DVRDT3  012402R  002   IFHEAD  013144R  002   PDRCON= 077406
CMDISU= 000100         DEVIML  011646R  002   DVREGE= 000322R  002   IFSECT  013161R  002   PDST  = 000122
CNTADR  002344R  002   DEVIOB= 000046          DVREGS  000116R  002   INFOMG  013122R  002   PFBBOV= 000002
```

DTRPAB.P11 SYMBOL TABLE

```
PFLGWD= 000000          PTEM2  = 000062          RPAS   = 000016          R1     =%000001          TOUTER  003074R     002
PFWADR= 000004          PTEM3  = 000064          RPBA   = 000004          R2     =%000002          TRE     = 040000
PLNGTH= 000026          PTEM4  = 000066          RPBAE  = 000050          R3     =%000003          TRMINT  006156R     002
PMOLCD= 000032          PTEM5  = 000070          RPCC   = 000036          R4     =%000004          TSTVEC  000072R     002
PNAME  = 000010         PTEM6  = 000072          RPCS1  = 000000          R5     =%000005          TVECT   007654R     002
PNBR   = 000116         PTEM7  = 000074          RPCS1V  002372R  002    SAVREG  011340R  002    TVECTX  007702R     002
PNTMSG  012236R  002    PTEM8  = 000076          RPCS2  = 000010          SEARCH  005346R  002    ULIST   000052R     002
POBJST= 000024          PTEM9  = 000100          RPCS2V  002374R  002    SECT    000010R  002    UNASCI  012332R     002
POPSW  = 000002         PTEND  = 000242          RPCS3  = 000052          SEEK    005324R  002    UNITMG  012306R     002
PORT   = 002000         PTLGTH= 000242           RPDA   = 000006          SETDED= 000040          UNLDIP= 000004
PROIOA= 000016          PTOCNT= 000030           RPDB   = 000022          SETERR  006202R  002    UNLOAD  004144R     002
PRINT   012122R  002    PTSIZE= 000240           RPDC   = 000034          SETVEC  000066R  002    UNS     = 040000
PROCEX  007616R  002    PUSRPC= 000236           RPDS   = 000012          SIZE    000026R  002    URSTOP= 000002
PROCTM  007502R  002    PUTBYT  000100R  002    RPDT   = 000026          SKCNT   002306R  002    USERUM= 000200
PROGNM  012240R  002    PWRIOA= 000020           RPEC1  = 000044          SKCOM   005334R  002    USMTPS= 000002
PRONER= 020000          P4CONS= 100000           RPEC2  = 000046          SP     =%000006          UXPATA  013655R     002
PRTEX   012234R  002    RDCNT   002300R  002    RPER1  = 000014          SPOPER= 000200          VV      = 000100
PRTIWD  012052R  002    RDCOM   005172R  002    RPER2  = 000040          STEPON  003570R  002    VVFLG   = 001000
PS     = 177776         RDHD    005242R  002    RPER3  = 000042          STEPEX  003470R  002    VVOFF   004036R     002
PSRC   = 000120         RDPSET  004160R  002    RPLA   = 000020          STEPUP  003422R  002    VVON    004026R     002
PSRCST= 000022          READ    005162R  002    RPMR   = 000024          STMADR  007466R  002    WAIT    003636R     002
PSTKCT= 000124          RECAL   005404R  002    RPOF   = 000032          STMNMG  013170R  002    WAITMD= 100000
PSTKSV= 000126          REGNUM= 000026           RPOFV   002376R  002    STMNUM  013200R  002    WCECNT  002334R     002
PSVREG= 000222          REL     004166R  002    RPSN   = 000030          STONER= 100000          WRCK    005266R     002
PSWD    000030R  002    RENDMG  012271R  002    RPTBAS  002752R  002    STPCEX  003566R  002    WRCKHD  005316R     002
PTEM0  = 000056         REPORT  002530R  002    RPTEND  002776R  002    STPCOM  003506R  002    WRCNT   002302R     002
PTEM1  = 000060         REPTBL  003016R  002    RPTLP   002734R  002    STPC10  003546R  002    WRCOM   005222R     002
PTEM10= 000102          RESREG  011354R  002    RPWC   = 000002          STSTAT  011412R  002    WRHD    005254R     002
PTEM11= 000104          RETCTR  005372R  002    RTNINT  000074R  002    SUIORG  005656R  002    WRITE   005212R     002
PTEM12= 000106          RETRYS  002336R  002    RTRY    000012R  002    SUPTAD  011372R  002    WT4IOT= 000010
PTEM13= 000110          RHPINT  005766R  002    RTRYIP  002366R  002    SWOIER= 000020          XXXX   = 000000
PTEM14= 000112          RINTEX  007652R  002    RTYEXH  013674R  002    SWOVER= 000010          .      = 014002R     002

. ABS.  000000     000
        000000     001
RJP11   014002     002

 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 *,DTRPAB/ML:TOC/DOC=DTRPAB.P11
 RUN-TIME: 8 17 1 SECONDS
 RUN-TIME RATIO: 108/27=3.9
 CORE USED:  6K  (11 PAGES)

 DOCUMENT PAGES:  57
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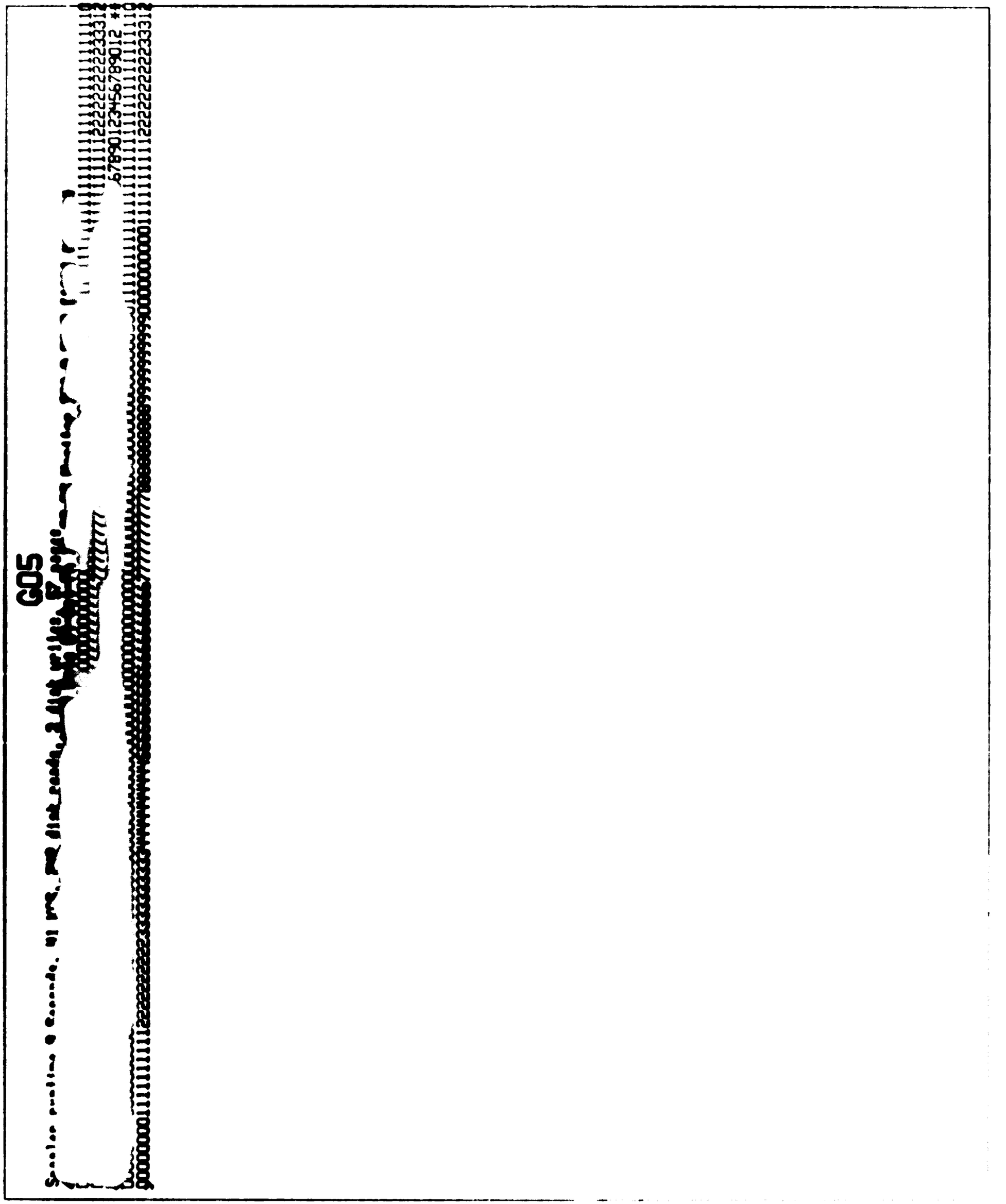
GOS