PC11

DEVICE ROUTINE (MPG)

MD-11-DTPCA-B

EP-DTPCA-B-DL-A

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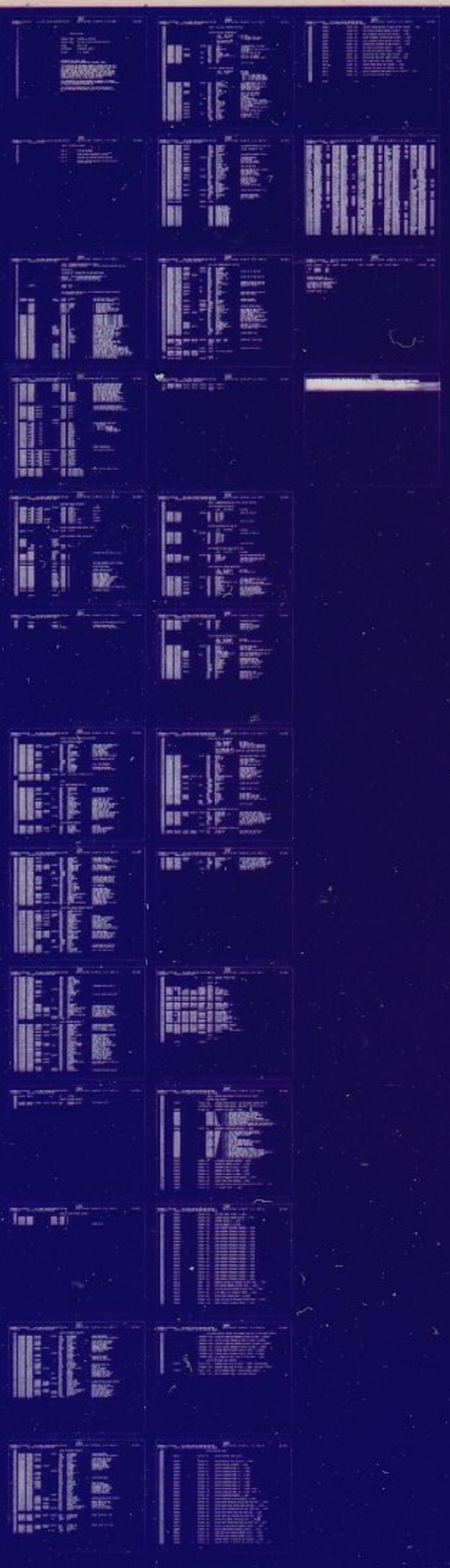

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                                IDENTIFICATION

                        PRODUCT CODE:   MAINDEC-11-DTPCA-B
                        PRODUCT NAME:   PC11/PR11 DEVICE ROUTINE FOR MPG
                        DATE:           APRIL 1976
                        MAINTAINER:     DIAGNOSTIC GROUP
                        AUTHOR:         W. R. GREENE


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                                .SBTTL  REVISION HISTORY

                                ;       APR 76          DTPCA-B RELEASE
                                ;       JAN 76          ADDED MEMORY MANAGEMENT SUPPORT
                                ;       OCT 75          CREATED FULL SUPPORT DEVICE ROUTINE
                                ;       AUG 75          DTPCA-A INITIAL RELEASE (MINIMUM SUPPORT
                                ;                       DEVICE ROUTINE)
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                                        .SBTTL  STANDARD DEVICE ROUTINE TABLE
                                        .TITLE  MAINDEC-11-DTPCA-B      PC11/PR11 DEVICE ROUTINE FOR MPG

                                        ;REVISION B

                                        ;FILENAME OF "TPCAB0.MPG" ON MPG/XXDP MEDIA

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

        000000'                         .CSECT  PC11
                                        .DSABL  GBL

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

000000' 004104          LOCZ:   .WORD   DVREND-.                ;DEVICE ROUT SIZE IN BYTES
000002' 000000          FLAGWD: .WORD   0                       ;DEVICE ROUT FLAGWORD

        100000                  DRWAIT= 100000                  ;  DEVICE ROUTINE WAIT FLAG
        040000                  WRBSY=  40000                   ;  WRITE BUSY FLAG
        020000                  RDBSY=  20000                   ;  READ BUSY FLAG
        000004                  CLWVCT= 4                       ;  CLEAR WRITE VECTOR FLAG
        000002                  CLRVCT= 2                       ;  CLEAR READ VECTOR FLAG
        000001                  LDRFLG= 1                       ;  LEADER FLAG

000004' 000000                  .WORD   0                       ;INTERFACE WORD # 1 (NOT USED)
000006' 000000                  .WORD   0                       ;INTERFACE WORD # 2 (NOT USED)
000010' 000000                  .WORD   0                       ;INTERFACE WORD # 3 (NOT USED)
000012' 000000                  .WORD   0                       ;INTERFACE WORD # 4 (NOT USED)
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          ERR:    .WORD   0                       ;ERROR ON LAST I/O INDICATOR
000024' 177550          DREGAD: .WORD   177550                  ;FIRST DEVICE REGISTER ADR
000026' 000070          IVCTAD: .WORD   70                      ;INTERRUPT VECTOR ADR
000030' 000200          RBUSRQ: .WORD   200                     ;INT PROC STATUS WORD (BR 4)
000032' 000200          WBUSRQ: .WORD   200                     ;INT PROC STATUS WORD (BR 4)
000034' 002164                  .WORD   HSKEEP-.                ;HOUSEKEEPING ROUT REL ADR
000036' 002216                  .WORD   REPORT-.                ;REPORT ROUT REL ADR
000040' 000504                  .WORD   KILL-.                  ;KILL ROUT REL ADR
000042' 000356                  .WORD   DATAER-.                ;DATA ERROR COUNTER REL ADR
000044' 000362                  .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
000060' 000000          BTASLZ: .WORD   0                       ;CONVERT BINARY TO DECIMAL ASCII BR ADR
000062' 000000          DECASC: .WORD   0                       ;CONVERT PACKED DECIMAL TO ASCII BR ADR
000064' 000000          CSYSFW: .WORD   0                       ;MPG SYSTEM FLAGWORD ADR
000066' 000000          SETVEC: .WORD   0                       ;SET INT VECT ROUT BR ADR
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                                CLRVEC: .WORD   0                       ;CLEAR INT VECTOR ROUT BR ADR
                                TSTVEC: .WORD   0                       ;TEST INT VECTOR ROUT BR ADR
                                RTNINT: .WORD   0                       ;RETURN FROM INT ROUT BR ADR
                                GETBYT: .WORD   0                       ;GET DATA BYTE ROUT BR ADR
                                PUTBYT: .WORD   0                       ;PUT DATA BYTE ROUT BR ADR
                                        .WORD   DVREGS-.                ;ADR OF DEVICE REGISTER NAMES
                                        .WORD   DVCMDS-.                ;ADR OF DEVICE FUNCTIONS
                                        .WORD   DVPKTE-.                ;ADR OF PACK TBL EXTENSION
                                        .WORD   DVMVTE-.                ;ADR OF MODEL VECTOR TBL EXTEN.
                                        .WORD   DVCPTE-.                ;ADR OF COMPILER TBL EXTEN.
                                        .WORD   DVIWST-.                ;ADR OF DEV INTERFACE WD SYM TBL

                                DVREGS: .ASCII  /PRS /                  ;VALID DEVICE REGISTER NAMES &
                                        .WORD   0                       ;THEIR POSITIONS RELATIVE TO
                                        .ASCII  /PRB /                  ;THE DEVICE REGISTERS BASE ADDRESS.
                                        .WORD   2
                                        .ASCII  /PPS /
                                        .WORD   4
                                        .ASCII  /PPB /
                                        .WORD   6
                                DVREGE= .

                                DVCMDS: .BYTE   120,1                   ;VALID DEVICE FUNCTIONS
                                        .WORD   READ-.                  ;  FLAG BYTE:
                                        .BYTE   130,1                   ;    BIT 7 = NPR DEV
                                        .WORD   WRITE-.                 ;    BIT 3 = MASSBUS DEV
                                        .BYTE   376,0                   ;    BIT 0 = 2 WORDS FOR ADR
                                        .WORD   LEADER-.                ;            (18 BIT ADRS)
                                        .BYTE   375,0
                                        .WORD   NOWAIT-.
                                        .BYTE   374,0
                                        .WORD   WAIT-.
                                        .BYTE   373,0
                                        .WORD   REPORT-.
                                        .BYTE   372,0
                                        .WORD   REPORT-.
                                        .WORD   177777                  ;TABLE TERMINATOR

                                DVPKTE: .ASCII  /LEADER/                ;PACK TABLE EXTENSION
                                        .BYTE   376,0
                                        .ASCII  /NOWAIT/
                                        .BYTE   375,0
                                        .ASCII  / WAIT/
                                        .BYTE   374,0
                                        .ASCII  /STATUS/
                                        .BYTE   373,0
                                        .ASCII  /COUNTS/
                                        .BYTE   372,0

                                DVMVTE: .WORD   376,LLDR-LOCZ           ;MODEL VECTOR TABLE EXTEN.
                                        .WORD   375,LNWAIT-LOCZ
                                        .WORD   374,LWAIT-LOCZ
                                        .WORD   373,LCOUNT-LOCZ
                                        .WORD   372,LCOUNT-LOCZ
```

```
                                        ;
                                        ;       COMPILER TABLE EXTENSION
                                        ;
000300' 004  376          DVCPTE: .BYTE   4,376                   ;LEADER
000302' 004537 000012 000000      .WORD   4537,10.,0
000310' 003  375                  .BYTE   3,375                   ;NO WAIT
000312' 004537 000012             .WORD   4537,10.
000316' 003  374                  .BYTE   3,374                   ;WAIT
000320' 004537 000012             .WORD   4537,10.
000324' 004  373                  .BYTE   4,373                   ;STATUS
000326' 004537 000012 001002      .WORD   4537,10.,1002
000334' 004  372                  .BYTE   4,372                   ;COUNTS
000336' 004537 000012 001001      .WORD   4537,10.,1001

                                        ;
                                        ;       DEVICE INTERFACE WORD SYMBOL TABLE
                                        ;
000344' 177777            DVIWST: .WORD   177777

                                        ;
                                        ;       MODEL STATEMENT TABLE EXTENSION
                                        ;
000346'                   LNWAIT:
000346'                   LWAIT:
000346'                   LSTATS:
000346'  000              LCOUNT: .BYTE   0
000347'  377  000         LLDR:   .BYTE   377,0
         000352'                  .EVEN

         000352'          HSKPST= .
         000352'          ISTAT=  .                              ;STORAGE FOR DEV REG'S AT INT
000352' 000000            PRS:    .WORD   0
000354' 000000            PRB:    .WORD   0
000356' 000000            PPS:    .WORD   0
000360' 000000            PPB:    .WORD   0

000362' 000004            CSTAT:  .BLKW   4.                      ;DEV REG CURRENT VALUE STORAGE

000372' 000000            BYRD:   .WORD   0                       ;BYTES READ COUNT
000374' 000000                    .WORD   0
000376' 000000            BYWR:   .WORD   0                       ;BYTES WRITTEN COUNT
000400' 000000                    .WORD   0
000402' 000000            RDCNT:  .WORD   0                       ;READ CMND COUNT
000404' 000000            WRCNT:  .WORD   0                       ;WRITE CMND COUNT
000406' 000000            MISCNT: .WORD   0                       ;MISC. CMND COUNT (LEADER)
000410' 000000            RICNT:  .WORD   0                       ;READ INTERRUPT COUNT
000412' 000000            WICNT:  .WORD   0                       ;WRITE INTERRUPT COUNT
000414' 000000            RDRERR: .WORD   0                       ;READER ERROR COUNT
000416' 000000            PUNERR: .WORD   0                       ;PUNCH ERROR COUNT
000420' 000000            DATAER: .WORD   0                       ;DATA ERROR COUNT
000422' 000000            TOECNT: .WORD   0                       ;# OF ENTRIES INTO T/O ERROR ROUT

000424' 000000            FLAG:   .WORD   0                       ;FLAGWORD STORAGE


         000426'          HSKPEN= .
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        000000          XXXX=   0                       ;VALUE TO BE TAILORED BY DEV ROUT

        000001          MMVER=  1                       ;SYSTEM FLGWD BIT DEF.
        120000          PSCONS= 120000                  ;INT SRVC VIRT PAGE BASE
```

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                                        .SBTTL  PC11/PR11 FUNCTION ROUTINES

                                        ;TIMEOUT ERROR HANDLER

000426' 005267 177770          TOUTER:  INC     TOECNT                  ;INCR TIME OUT ERROR COUNT
000432' 026727 177764 000010            CMP     TOECNT,#8.              ;EXCEEDED 8 TIMEOUTS?
000440' 001401                          BEQ     2$                      ;YES - CONTINUE
000442' 000205                          RTS     R5                      ;NO - RETURN
000444' 004067 002416          2$:      JSR     R0,SAVREG               ;SAVE REGISTERS
000450' 004767 002444                   JSR     PC,SUPTAD               ;P TBL ADR TO R3
000454' 042713 000010                   BIC     #WT4IOT,(R3)            ;RESET WAIT FOR I/O TERM
000460' 005004                          CLR     R4
000462' 004567 002624                   JSR     R5,PRINT                ;PRINT TIMEOUT ERR MSG
000466' 000126                          .WORD   TOEMSG-.
000470' 000030                          .WORD   24.
000472' 004567 000046                   JSR     R5,KILL                 ;KILL THE PROGRAM
000476' 004767 002144                   JSR     PC,ERDIRG
000502' 004067 002374                   JSR     R0,RESREG               ;RESTORE REGISTERS
000506' 012605                 TOUTEX:  MOV     (SP)+,R5                ;GO DISPLAY DEVICE REGS
000510' 000177 177334                   JMP     @CUPGER

000514' 041520 030461 050057   TOEMSG:  .ASCII  'PC11/PR11 TIMEOUT ON I/O'
000522' 030522 020061 044524
000530' 042515 052517 020124
000536' 047117 044440 047457

                                        .EVEN

                                        ;KILL USER PROGRAM ROUTINE

000544' 016702 177254          KILL:    MOV     DREGAD,R2               ;GET DEV REG ADR
000550' 032712 000100                   BIT     #100,(R2)               ;ANY INT EBLS SET ?
000554' 001005                          BNE     1$                      ;YES-CONTINUE
000556' 032762 000100 000004            BIT     #100,4(R2)
000564' 001001                          BNE     1$
000566' 000425                          BR      KILLEX
000570' 004567 002632          1$:      JSR     R5,TRVECT               ;TEST READ INT VECTOR
000574' 000407                          BR      CWRINT                  ;BRANCH IF NOT ME
000576' 042712 000100                   BIC     #100,(R2)               ;RESET RD INT EBL
000602' 042767 020000 177172            BIC     #RDBSY,FLAGWD           ;RESET READ BSY IN FLAG WD
000610' 004767 001342                   JSR     PC,RRINTV               ;RESET READ INT VECTOR
000614' 004567 002636          CWRINT:  JSR     R5,TWVECT               ;TEST WRITE INT VECTOR
000620' 000410                          BR      KILLEX                  ;BRANCH IF NOT ME
000622' 042762 000100 000004            BIC     #100,4(R2)              ;RESET WR INT EBL
000630' 042767 040000 177144            BIC     #WRBSY,FLAGWD           ;RESET WRITE BSY IN FLAG WD
000636' 004767 001332                   JSR     PC,RWINTV               ;RESET WRITE INT VECTOR
000642' 005067 177154          KILLEX:  CLR     ERR                     ;CLEAR ERROR INDICATOR
000646' 005067 000674                   CLR     ERRFLG                  ;CLEAR INTERN ERR FLAG
000652' 000205                          RTS     R5                      ;RETURN

                                        ;READ COMMAND HANDLER

000654' 010567 002074          READ:    MOV     R5,STMNT                ;SAVE R5
000660' 162767 000004 002066            SUB     #4,STMNT                ;FOR STMNT # REFERENCE
000666' 016704 177132                   MOV     DREGAD,R4               ;DEV REG ADDR TO R4
000672' 032767 020000 177102            BIT     #RDBSY,FLAGWD           ;TEST READ BUSY
000700' 001026                          BNE     GTPTBS                  ;BRANCH IF SET
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                                                BIT     #100,(R4)               ;TEST RECV INT EBL
                                                BEQ     SROBSY                  ;CONTINUE IF NOT SET
                                                JSR     R5,@CIOBSY              ;OTHERWISE RELEASE CONTROL
                                                BR      READ
000716' 052767  020000  177056  SROBSY:       BIS     #RDBSY,FLAGWD           ;SET READ BUSY
000724' 016767  177076  000012                MOV     IVCTAD,10$              ;INT VECTOR ADDR TO CALL
000732' 016767  177072  000006                MOV     RBUSRQ,20$              ;ALSO BUS PRIORITY
000740' 004577  177122                        JSR     R5,@SETVEC              ;GO SET THE VECTOR
000744' 000000                        10$:     .WORD   XXXX
000746' 000000                        20$:     .WORD   XXXX
000750' 001012                                .WORD   RDINT-.
000752' 005067  177444                        CLR     IOECNT                  ;CLEAR TIME OUT ERR CNT
000756' 004767  002136                GTPTBS: JSR     PC,SUPTAD               ;GET P TBL BASE IN R3
000762' 005267  177414                        INC     RDCNT                   ;INCREMENT READ CMD CT
000766' 005067  177030                        CLR     ERR                     ;CLEAR ERROR INDICATOR
000772' 005063  000030                        CLR     PTOCNT(R3)
001000' 012500                        RDMNST: MOV     (R5)+,R0                ;GET ADDRESS
001002' 012567  000532                        MOV     (R5)+,RADDR
001006' 012567  000530                        MOV     (R5)+,RBYTES            ;BYTE COUNT AND
001012' 012500                                MOV     (R5)+,R0                ;ABSORB NEXT PARAM
001014' 005214                                INC     (R4)                    ;SET READER ENABLE
001016' 052763  000010  000000                BIS     #WT4IOT,PFLGWD(R3)      ;SET WAIT FOR I/O TERM
001024' 052714  000100                        BIS     #100,(R4)               ;SET RECV INT EBL
001030' 032767  100000  176746                BIT     #DRWAIT,FLAGWD          ;TEST DEV RQUT NOWAIT
001036' 001002                                BNE     RDNOWT                  ;BRANCH IF SET
001040' 000167  000316                        JMP     TSTIEB                  ;OTHERWISE WAIT
001044' 042763  000010  000000        RDNOWT: BIC     #WT4IOT,PFLGWD(R3)      ;CLEAR WAIT FOR I/O TERM
001052' 000205                                RTS     R5                      ;RETURN INLINE


                                        ;WRITE AND LEADER COMMAND HANDLER


001054' 042767  000001  176722  WRITE:  BIC     #LDRFLG,FLAGWD
001062' 000403                          BR      XMIT
001064' 052767  000001  176712  LEADER: BIS     #LDRFLG,FLAGWD
001072' 010567  001660          XMIT:   MOV     R5,STMNT                ;SAVE R5
001076' 162767  000004  001652          SUB     #4,STMNT                ;FOR STMNT # REFERENCE
001104' 016704  176716                  MOV     DREGAD,R4               ;DEV REG ADDR TO R4
001110' 032767  040000  176666          BIT     #WRBSY,FLAGWD           ;TEST WRITE BUSY
001116' 001032                          BNE     CLRERR                  ;BRANCH IF SET
001120' 032764  000100  000004          BIT     #100,4(R4)              ;TEST PUNCH INT EBL
001126' 001403                          BEQ     SETBSY                  ;CONTINUE IF NOT SET
001130' 004577  176714                  JSR     R5,@CIOBSY              ;OTHERWISE RELEASE CONTROL
001134' 000756                          BR      XMIT
001136' 052767  040000  176640  SETBSY: BIS     #WRBSY,FLAGWD           ;SET WRITE BUSY
001144' 016767  176660  000020          MOV     IVCTAD,10$              ;INT VECTOR ADDR TO CALL
001152' 062767  000004  000012          ADD     #4,10$                  ;ADJUST FOR WRITE INT
001160' 016767  176650  000006          MOV     WBUSRQ,20$              ;ALSO PASS BUS PRIORITY
001166' 004577  176676                  JSR     R5,@SETVEC              ;GO SET THE VECTOR
001172' 000000                  10$:     .WORD   XXXX
001174' 000000                  20$:     .WORD   XXXX
001176' 000354                          .WORD   WRINT-.
001200' 005067  177220                  CLR     IOECNT                  ;CLEAR TIME OUT ERR CNT
001204' 005067  176614          CLRERR: CLR     ERR                     ;CLEAR ERROR INDICATOR
001210' 005063  000030                  CLR     PTOCNT(R3)
001214' 004767  001702                  JSR     PC,SUPTAD               ;GET P TBL BASE IN R3
001220' 032767  000001  176556          BIT     #LDRFLG,FLAGWD
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001224' 001011                          BNE     LDRYES
001226' 012500                          MOV     (R5)+,R0
001230' 012767  000306                  MOV     (R5)+,WADDR
001234' 012767  000304                  MOV     (R5)+,WBYTES
001240' 012500                          MOV     (R5)+,R0
001242' 005267  177136                  INC     WRCNT                   ;INCREMENT WRITE CMD CT
001246' 000420                          BR      PUNEBL
001250' 010700          LDRYES: MOV     PC,R0
001252' 062700  000072                  ADD     #BLANK-.,R0
001256' 010067  000260                  MOV     R0,WADDR
001262' 012500                          MOV     (R5)+,R0                ;PICK UP LENGTH FROM CALL
001264' 012701  000012                  MOV     #10.,R1
001270' 005002                          CLR     R2
001272' 060002          1$:     ADD     R0,R2
001274' 005301                          DEC     R1
001276' 001375                          BNE     1$
001300' 010267  000240                  MOV     R2,WBYTES
001304' 005267  177076                  INC     MISCNT                  ;INCREMENT MISC CMD CT
001310' 052763  000010  000000  PUNEBL: BIS     #WT4IOT,PFLGWD(R3)      ;SET WAIT FOR I/O TERM
001316' 052764  000100  000004          BIS     #100,4(R4)              ;SET PUNCH INT EBL
001324' 032767  100000  176450          BIT     #DRWAIT,FLAGWD          ;TEST DEV ROUT NOWAIT
001332' 001412                          BEQ     TSTIEB                  ;IF RESET TEST INT EBL
001334' 042763  000010  000000          BIC     #WT4IOT,PFLGWD(R3)      ;CLEAR WAIT FOR I/O TERM
001342' 000205          RETURN: RTS     R5                              ;OTHERWISE RETURN
001344' 000000          BLANK:  .WORD   0

                        ;WAIT COMMAND HANDLER

001346' 042767  100000  176426  WAIT:   BIC     #DRWAIT,FLAGWD          ;CLEAR DEV ROUT NOWAIT
001354' 016704  176444                  MOV     DREGAD,R4               ;POINT R4 AT REG ADDR
001360' 032714  000100          TSTIEB: BIT     #100,(R4)               ;TEST INT EBLS
001364' 001055                          BNE     RELEAS                  ;IF SET, RELEASE CONTROL
001366' 032764  000100  000004          BIT     #100,4(R4)
001374' 001051                          BNE     RELEAS
001376' 032767  000002  176376  TRMTST: BIT     #CLRVCT,FLAGWD          ;TEST IF VECTOR CLR REQD
001404' 001410                          BEQ     10$                     ;BRANCH IF NOT
001406' 004567  002014                  JSR     R5,TRVECT               ;TEST READ VECTOR
001412' 000405                          BR      10$                     ;BRANCH IF NOT ME
001414' 004767  000536                  JSR     PC,RRINTV               ;GO RESET THE VECTOR
001420' 042767  000002  176354          BIC     #CLRVCI,FLAGWD          ;CLEAR THE REQ FLAG
001426' 032767  000004  176346  10$:    BIT     #CLWVCT,FLAGWD          ;TEST IF VECTOR CLR REQD
001434' 001410                          BEQ     ERRTST                  ;BRANCH IF NOT
001436' 004567  002014                  JSR     R5,TWVECT               ;TEST WRITE VECTOR
001442' 000405                          BR      ERRTST                  ;BRANCH IF NOT ME
001444' 004767  000524                  JSR     PC,RWINTV               ;GO RESET THE VECTOR
001450' 042767  000004  176324          BIC     #CLWVCT,FLAGWD          ;CLEAR THE REQ FLAG
001456' 005767  000064          ERRTST: TST     ERRFLG                  ;TEST FOR ANY ERROR
001462' 001727                          BEQ     RETURN                  ;RETURN IF NONE
001464' 012767  000001  176330          MOV     #1,ERR                  ;SET ERROR INDICATOR
001472' 004767  001422                  JSR     PC,SUPTAD
001476' 032763  020000  000002          BIT     #PRONER,POPSW(R3)       ;TEST DONT PRINT ON ERR BIT
001504' 001003                          BNE     ERREXT                  ;EXIT IF SET
001506' 005004                          CLR     R4
001510' 000167  001030                  JMP     ERRRPT
001514' 000177  176330          ERREXT: JMP     @CUPGER
001520' 004577  176322          RELEAS: JSR     R5,@CIOBSY              ;OTHERWISE RELEASE CONTROL
```

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001524' 000715                          BR      TSTIEB

                                        ;NOWAIT COMMAND HANDLER

001526' 052767  100000  176246  NOWAIT: BIS     #DRWAIT,FLAGWD          ;SET NOWAIT FLAG
001534' 000702                          BR      RETURN
```

```
                                        ;WRITE & READ CONTROL TABLES
                                
001536' 000000          RADDR:  .WORD   0
001540' 000000          RBYTES: .WORD   0
001542' 000000          WADDR:  .WORD   0
001544' 000000          WBYTES: .WORD   0
001546' 000000          ERRFLG: .WORD   0               ;ERROR FLAG
```

```
                                        ;WRITE INTERRUPT HANDLER

001550' 004067 001312          WRINT:   JSR     R0,SAVREG          ;SAVE REGISTERS
001554' 004567 001360                   JSR     R5,STSTAT          ;STORE DEVICE REG CONTENTS
001560' 176572                          .WORD   ISTAT-.
001562' 005267 176624                   INC     WICNT              ;INCR WRITE INT COUNT
001566' 004767 001326                   JSR     PC,SUPTAD          ;SET UP INT POINTERS
001572' 005764 000004                   TST     4(R4)              ;TEST FOR ERROR
001576' 100006                          BPL     PUNRDY             ;BRANCH IF NONE
001600' 152767 000001 177740            BISB    #1,ERRFLG          ;REMEMBER PUNCH ERROR
001606' 005267 176604                   INC     PUNERR             ;INCR PUNCH ERROR
001612' 000437                          BR      STPPUN             ;ABORT WRITE
001614' 010701                 PUNRDY:  MOV     PC,R1
001616' 062701 176562                   ADD     #BYWR+2-.,R1
001622' 005767 177716                   TST     WBYTES             ;TEST BYTE COUNT
001626' 001423                          BEQ     WTERM              ;BRANCH IF ZERO
001630' 062711 000001                   ADD     #1,(R1)            ;INCR BYTES WRITTEN
001634' 005541                          ADC     -(R1)
001636' 016700 177700                   MOV     WADDR,R0
001642' 004777 176230                   JSR     PC,@GETBYT         ;GET BYTE FROM MEM
001646' 110164 000006                   MOVB    R1,6(R4)           ;PUNCH IT
001652' 032767 000001 176122            BIT     #LDRFLG,FLAGWD     ;TEST IF LEADER
001660' 001002                          BNE     10$                ;SKIP IF YES
001662' 005267 177654                   INC     WADDR              ;ELSE BUMP ADR PTR
001666' 005367 177652          10$:     DEC     WBYTES             ;DECREMENT BYTE COUNT
001672' 001401                          BEQ     WTERM              ;TERMINATE IF ZERO
001674' 000425                          BR      INTEXT             ;ELSE RETN FROM INT
001676' 010701                 WTERM:   MOV     PC,R1
001700' 062701 176476                   ADD     #BYWR-.,R1
001704' 016167 000002 176106            MOV     2(R1),SIZE         ;UPDATE ACTUAL BYTES XFERRED
001712' 042767 040000 176062   STPPUN:  BIC     #WRBSY,FLAGWD
001720' 042764 000100 000004            BIC     #100,4(R4)         ;RESET XMIT INT EBL
001726' 032714 000100                   BIT     #100,(R4)          ;RECEIVE INT STILL UP?
001732' 001003                          BNE     GVECAD             ;YES - CONTINUE
001734' 042763 000010 000000            BIC     #WT4IOT,PFLGWD(R3) ;NO-RESET WAIT FOR IOT
001742' 052767 000004 176032   GVECAD:  BIS     #CLRVCT,FLAGWD     ;SET CLR VECT REQUEST
001750' 004067 001126          INTEXT:  JSR     R0,RESREG          ;RESTORE REGISTERS
001754' 000177 176114                   JMP     @RTNINT            ;RETURN FROM INTERRUPT
001760' 000000                 WRBCNT:  .WORD   0                  ;WRITE BYTE COUNT
```

```
                                                ;READ INTERRUPT HANDLER

002162' 004067 001100          RDINT:  JSR     R0,SAVREG               ;SAVE REGISTERS
002166' 004567 001146                  JSR     R5,STSTAT               ;STORE DEVICE REG CONTENTS
002172' 176360                         .WORD   ISTAT-.
002174' 005267 176410                  INC     RICNT                   ;INCR READ INT COUNT
002200' 004767 001114                  JSR     PC,SUPTAD               ;SET UP INTERN PTRS
002204' 005714                         TST     (R4)                    ;TEST FOR ERROR
002206' 100006                         BPL     RDRRDY                  ;BRANCH IF NONE
002210' 152767 000002  177530          BISB    #2,ERRFLG               ;REMEMBER RDR ERR
002216' 005267 176372                  INC     RDRERR                  ;INCR READER ERROR
002222' 000434                         BR      STPRDR                  ;ABORT READ
002224' 010701                 RDRRDY: MOV     PC,R1
002226' 062701 176346                  ADD     #BYRD+2-.,R1
002232' 005767 177502                  TST     RBYTES
002236' 001420                         BEQ     RTERM
002240' 062711 000001                  ADD     #1,(R1)                 ;INCR BYTES READ
002244' 005541                         ADC     -(R1)
002246' 016700 177464                  MOV     RADDR,R0
002252' 116401 000002                  MOVB    2(R4),R1                ;READ A BYTE
002256' 004777 176016                  JSR     PC,@PUTBYT              ;PUT IT IN MEMORY
002262' 005267 177450                  INC     RADDR                   ;INCREMENT ADDRESS
002266' 005367 177446                  DEC     RBYTES                  ;DECREMENT BYTE COUNT
002272' 001402                         BEQ     RTERM                   ;TERMINATE IF ZERO!
002274' 005214                         INC     (R4)                    ;ELSE SET RDR EBL
002276' 000724                         BR      INTEXT                  ;THEN RETN FROM INT
002100' 010701                 RTERM:  MOV     PC,R1
002102' 062701 176270                  ADD     #BYRD-.,R1
002106' 016167 000002  175704          MOV     2(R1),SIZE              ;UPDATE ACTUAL BYTES XFERRED
002114' 042767 000000  175660  STPRDR: BIC     #RDBSY,FLAGWD
002122' 042714 000100                  BIC     #100,(R4)               ;RESET READ INT EBL
002126' 032764 000100  000004          BIT     #100,4(R4)              ;WRITE INT STILL UP?
002134' 001003                         BNE     RERVEC                  ;YES-CONTINUE
002136' 042763 000010  000000          BIC     #WT4IOT,PFLGWD(R3)      ;RESET WAIT FOR IOT
002144' 052767 000002  175630  RERVEC: BIS     #CLRVCT,FLAGWD          ;SET CLR VECT REQUEST
002152' 000167 177572                  JMP     INTEXT


002156' 016767 175644  000004  RRINTV: MOV     IVCTAD,10$              ;RESET READ VECT SUBR
002164' 004577 175700                  JSR     R5,@CLRVEC
002170' 000000                 10$:    .WORD   XXXX
002172' 000207                         RTS     PC


002174' 016767 175626  000012  RWINTV: MOV     IVCTAD,10$              ;RESET WRITE VECT SUBR
002202' 062767 000004  000004          ADD     #4,10$
002210' 004577 175654                  JSR     R5,@CLRVEC
002214' 000000                 10$:    .WORD   XXXX
002216' 000207                         RTS     PC
```

```
                                .SBTTL  PC11/PR11 SUPPORT ROUTINES

                                ;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
002220' 005725          HSKEEP: TST     (R5)+                   ;UNCONDITIONALLY DO HSKP?
002222' 001003                  BNE     10$                     ;N,Y-10$
002224' 032702  000004          BIT     #HSKPEP,R2              ;OPSW SPECIFY EACH PASS HSKP?
002230' 001010                  BNE     30$                     ;Y,N-30$
002232' 010700          10$:    MOV     PC,R0                   ;SET UP FIRST WD ADR
002234' 062700  176116          ADD     #HSKPST-.,R0
002240' 012701  000026          MOV     #HSKPEN-HSKPST/2,R1     ;SET UP # OF WORDS
002244' 005020          20$:    CLR     (R0)+                   ;HSKP ALL NECESSARY AREAS
002246' 005301                  DEC     R1
002250' 001375                  BNE     20$
002252' 000205          30$:    RTS     R5                      ;EXIT IN-LINE

                                ;PC11/PR11 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
                                ;
002254' 005067  000232  REPORT: CLR     ABBREV                  ;CLR ABBREVIATED RPT FLAG
002260' 004067  000602          JSR     R0,SAVREG               ;SAVE REG'S R0 - R5
002264' 032715  177776          BIT     #177776,(R5)            ;DISPLAYING CNTS AT END OF
002270' 001012                  BNE     8$                      ;PROG PASS? (Y,N-8$)
002272' 010700                  MOV     PC,R0                   ;SET UP ADR OF CNTS
002274' 062700  176076          ADD     #BYRD-.,R0
002300' 012701  000014          MOV     #12.,R1                 ;GET # OF CNT WORDS
002304' 005720          2$:     TST     (R0)+                   ;THIS CNT WORD = 0?
002306' 001003                  BNE     8$                      ;Y,N-8$
002310' 005301                  DEC     R1                      ;DECR WORD CNT
002312' 001374                  BNE     2$                      ;CK'ED ALL WORDS? (Y,N-2$)
002314' 000472                  BR      DVREX                   ;GO TO EXIT -- ALL CNTS ARE 0'S
002316' 004767  000576  8$:     JSR     PC,SUPTAD               ;SET UP PROG TBL ADR IN R3
002322' 012504                  MOV     (R5)+,R4                ;GET FLAGWORD
002324' 032704  000002          BIT     #2,R4                   ;GOING TO DO STATUS DISPLAY?
002330' 001403                  BEQ     10$                     ;Y,N-10$
002332' 004567  000602          JSR     R5,STSTAT               ;GO STORE STATUS REG'S
002336' 176024                  .WORD   CSTAT-.
002340' 032704  000002  10$:     BIT     #2,R4                   ;DISPLAY DEV STATUS?
002344' 001416                  BEQ     DISCNT                  ;Y,N-DISCNT
002346' 004567  000740          JSR     R5,PRINT                ;ISSUE 'AT INT' MSG
002352' 001147                  .WORD   ATINSG-.
002354' 000014                  .WORD   12.
```

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002356' 004567 000640          JSR     R5,DISPST       ;GO DISPLAY STATUS AT LAST INT
002360' 175770                 .WORD   ISTAT-.
002362' 004567 000722          JSR     R5,PRINT        ;ISSUE 'CURRENTLY' MSG
002366' 001145                 .WORD   CURMSG-.
002370' 000012                 .WORD   10.
002372' 004567 000622          JSR     R5,DISPST       ;GO DISPLAY CURRENT STATUS
002376' 175762                 .WORD   CSTAT-.
002400' 032704 000001  DISCNT: BIT     #1,R4           ;DISPLAY COUNTS?
002404' 001431                 BEQ     RPTEND          ;Y,N-RPTEND
002406' 012700 000014          MOV     #12.,R0         ;SET UP # OF WORDS
002412' 010701                 MOV     PC,R1           ;SET UP ADR OF CNTS
002414' 062701 175754          ADD     #BYRD-.,R1
002420' 010702                 MOV     PC,R2           ;SET UP TBL ADR
002422' 062702 000070          ADD     #REPTBL-.,R2
002426' 012267 000012  RPTLP:  MOV     (R2)+,RPTBAS    ;MOV MSG ADR TO S/R LINKAGE
002432' 004067 000426          JSR     R0,SAVREG       ;SAVE ALL REG'S
002436' 011100                 MOV     (R1),R0         ;GET CURRENT COUNT
002440' 004577 175410          JSR     R5,2$BINASC     ;CONVERT IT TO ASCII
002444' 000000  RPTBAS: .WORD  XXXX
002446' 004067 000426          JSR     R0,RESREG       ;RESTORE REG'S
002452' 005721                 TST     (R1)+           ;POINT AT NXT CNT
002454' 005300                 DEC     R0              ;DONE ALL WORDS?
002456' 001363                 BNE     RPTLP           ;Y,N-RPTLP
002460' 004567 000624          JSR     R5,PRINT        ;GO ISSUE COUNTS MSG
002464' 001112                 .WORD   CNTSMG-.
002466' 000304                 .WORD   CNTSEN-CNTSMG
002470' 004567 000614  RPTEND: JSR     R5,PRINT        ;ISSUE "END OF REPORT" MSG
002474' 001051                 .WORD   RENDMG-.
002476' 177763                 .WORD   -13.
002500' 004067 000374  DVREX:  JSR     R0,RESREG       ;RESTORE REGISTERS
002504' 005725                 TST     (R5)+           ;SET UP RETURN POINT
002506' 000205                 RTS     R5              ;EXIT IN-LINE

002510' 000000  ABBREV: .WORD  0


002512' 001146  REPTBL: .WORD  BCMRD-RPTBAS
002514' 001154          .WORD  BCMRD+6-RPTBAS
002516' 001170          .WORD  BCMWR-RPTBAS
002520' 001176          .WORD  BCMWR+6-RPTBAS
002522' 001223          .WORD  CMDCRD-RPTBAS
002524' 001236          .WORD  CMDCWR-RPTBAS
002526' 001253          .WORD  CMDCMS-RPTBAS
002530' 001305          .WORD  RDIMMS-RPTBAS
002532' 001320          .WORD  WRIMMS-RPTBAS
002534' 001352          .WORD  ERRRDA-RPTBAS
002536' 001370          .WORD  ERRPUN-RPTBAS
002540' 001430          .WORD  ERCDTA-RPTBAS
002542'
```

```
                                                ;PC11/PR11 ERROR REPORT ROUTINE
                                
002544' 004767  000004          ERRRPT: JSR     PC,ERRDIS
002550' 000177  175274                  JMP     @CUPGER
002554' 010701                  ERRDIS: MOV     PC,R1           ;POINT R1 AT ERR MSG
002556' 062701  000222                  ADD     #EMSGBF-.,R1
002562' 012767  000022  000054          MOV     #18.,ERRBCT
002570' 010700                  MOV     PC,R0                   ;POINT R0 AT ERR MSG TBL
002572' 062700  000144                  ADD     #ERCOTB-.,R0
002576' 105710                  1$:     TSTB    (R0)
002600' 001416                  BEQ     ERTBEN                  ;BRANCH IF R0 AT TBL END
002602' 132067  176740                  BITB    (R0)+,ERRFLG    ;TEST FOR PARTICULAR ERR
002606' 001003                  BNE     3$                      ;BRANCH IF FOUND
002610' 062700  000005          2$:     ADD     #5,R0
002614' 000770                  BR      1$
002616' 012702  000005          3$:     MOV     #5,R2
002622' 112021                  4$:     MOVB    (R0)+,(R1)+     ;MOVE MSG CODE TO ERR MSG
002624' 005267  000014                  INC     ERRBCT          ;BUMP BYTE COUNT
002630' 005302                  DEC     R2
002632' 001373                  BNE     4$
002634' 000760                  BR      1$                      ;CHECK IF MORE
002636' 004567  000450          ERTBEN: JSR     R5,PRINT        ;PRINT ERROR MSG
002642' 000114                          .WORD   EMSGHD-.
002644' 000021                  ERRBCT: .WORD   17.
002646' 004567  000350          ERDIRG: JSR     R5,DISPST       ;DISPLAY DEVICE REGS
002652' 175500                          .WORD   ISTAT-.
002654' 016300  000022          ERRSNM: MOV     PSRCST(R3),R0   ;GET ADDR OF SRC STMNTS
002660' 111001                  10$:    MOVB    (R0),R1         ;SAVE STMNT LENGTH
002662' 026067  000004  000064          CMP     4(R0),STMNT     ;ERROR OCCUR ON THIS STMNT?
002670' 001402                  BEQ     20$                     ;YES - BRANCH
002672' 060100                  ADD     R1,R0                   ;POINT AT NEXT STATEMENT
002674' 000771                  BR      10$                     ;GO CK NEXT STMNT
002676' 005720                  20$:    TST     (R0)+           ;SET UP ADR OF STMNT # DATA
002700' 010701                  MOV     PC,R1                   ;SET UP DATA OUTPUT ADDR
002702' 062701  000156                  ADD     #STMNUM-.,R1
002706' 004577  175150                  JSR     R5,@DECASC      ;CONVERT IT TO ASCII
002712' 012767  020040  000144          MOV     #20040,STMNUM+4 ;SET 2 LOW DIGITS TO SPACES
002720' 004567  000366                  JSR     R5,PRINT        ;ISSUE STMNT # MSG
002724' 000124                          .WORD   STMNMG-.
002726' 177762                          .WORD   -14.
002730' 005067  176612                  CLR     ERRFLG          ;CLEAR ERROR FLAG
002734' 000207                  RTS     PC

002736' 020001  050040  047125  ERCDTB: .ASCII  <001>/  PUN/           ;ERROR MSG  CODE TABLE
002744' 020002  051040  051104          .ASCII  <002>/  RDR/
002752'     000                 .BYTE   0
            002754'             .EVEN

002754' 000000                  STMNT:  .WORD   0                       ;SAVED R5 FOR STMNT #

002756' 041520  030461  050057  EMSGHD: .ASCII  'PC11/PR11 ERROR:  '
002764' 030522  020031  051105
002772' 047522  035122  020040
                                .EVEN
003000' 000050                  EMSGBF: .BLKB   40.
```

```
  662  003050' 052123  047115  020124  STMNMG: .ASCII  /STMNT # /
       003056' 020043
  663  003060' 054130  054130  054130  STMNUM: .ASCII  /XXXXXX/
  664                                          .EVEN
```

```
                                        .SBTTL  SUBROUTINES FOR PC11/PR11 DEVICE ROUTINE
                                        ;SAVE REGISTERS R0 THRU R5
                                                ;JSR    R0,SAVREG       S/R CALL
003066' 010146                  SAVREG: MOV     R1,-(SP)                ;SAVE R0 THRU R5
003070' 010246                          MOV     R2,-(SP)
003072' 010346                          MOV     R3,-(SP)
003074' 010446                          MOV     R4,-(SP)
003076' 010546                          MOV     R5,-(SP)
003100' 010007                          MOV     R0,PC                   ;EXIT IN-LINE

                                        ;RESTORE REGISTERS R0 THRU R5
                                                ;JSR    R0,RESREG       S/R CALL
003102' 005726                  RESREG: TST     (SP)+                   ;RESTORE R4 THRU R0
003104' 012605                          MOV     (SP)+,R5
003106' 012604                          MOV     (SP)+,R4
003110' 012603                          MOV     (SP)+,R3
003112' 012602                          MOV     (SP)+,R2
003114' 012601                          MOV     (SP)+,R1
003116' 000200                          RTS     R0                      ;EXIT IN-LINE

                                        ;SET PROGRAM'S PROG TABLE ADR IN R3
                                                ;JSR    PC,SUPTAD       S/R CALL
003120' 010703                  SUPTAD: MOV     PC,R3                   ;SET UP LOCATION ZERO ADR
003122' 062703  174656                  ADD     #LOCZ-.,R3
003126' 166303  177776                  SUB     -2(R3),R3               ;SUBTRACT PROG TBL LENGTH
003132' 016704  174666                  MOV     DREGAD,R4               ;PUT DEV REG ADR IN R4
003136' 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
003140' 016701  174660          STSTAT: MOV     DREGAD,R1
003144' 010500                          MOV     R5,R0                   ;GET REL STORAGE ADR & MAKE
003146' 062500                          ADD     (R5)+,R0                ;IT ABSOLUTE
003150' 012746  000004                  MOV     #DVREGE-DVREGS/6,-(SP)  ;GET # OF REG'S TO STORE
003154' 010702                          MOV     PC,R2                   ;GET ADR OF 1ST REG DISPLACEMENT
003156' 062702  174744                  ADD     #DVREGS+4-.,R2
003162' 011201                  10$:    MOV     (R2),R1                 ;GET REG DISPLACEMENT
003164' 066701  174634                  ADD     DREGAD,R1               ;ADD IN REG'S BASE ADR
003170' 011120                          MOV     (R1),(R0)+              ;STORE REGISTER VALUE
003172' 062702  000006                  ADD     #6,R2                   ;POINT AT NXT DISPLACEMENT
003176' 022716  000004                  CMP     #4,(SP)                 ;ABOUT TO STORE 2ND REG?
003202' 001003                          BNE     20$                     ;NO-CONTINUE
```

```
                                                ;YES-BETTER BYPASS IT
                                                ;DECR REG CNT
                                                ;DONE ALL? (Y,N-10$)
                                                ;CLEAN UP THE STACK
                                                ;EXIT IN-LINE


                                                ;TAILOR STATUS MSG & PRINT IT

                                                S/R CALL
                                                REL ADR OF STATUS DATA
                                                ;DESTROYS R0,R1,R2

                                                ;GET REL DATA ADR
                                                ;MAKE IT ABS
                                                ;SET UP ADR OF REG NAMES IN ASCII
                                                ;GET # OF REGISTERS TO DISPLAY
                                                ;MOVE REG NAME TO MSG
                                                ;BYPASS DISP VALUE
                                                ;SAVE REG'S R0 - R5
                                                ;GET REG'S STORED VALUE
                                                ;CONVERT IT TO ASCII
                                                ;PRINT THE STATUS MSG


                                                ;RESTORE R0 - R4
                                                ;POINT AT NXT REG VALUE
                                                ;DECR REG CNT
                                                ;DONE ALL? (Y,N-10$)
                                                ;EXIT IN-LINE
```

```
                                        ;ISSUE MSG TO LIST DEVICE
                                        ;
                                        ;       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
                                        ;
003312' 010500          PRINT:  MOV     R5,R0                   ;GET MSG ADR & MAKE IT ABS
003314' 062500                  ADD     (R5)+,R0
003316' 012501                  MOV     (R5)+,R1                ;GET BYTE COUNT
003320' 005704                  TST     R4                      ;USE CMND MODE PRINT?
003322' 100030                  BPL     40$                     ;Y,N-40$
003324' 010702                  MOV     PC,R2                   ;SET UP LINK INFO ADR
003326' 062702  000040          ADD     #20$-.,R2
003332' 160200                  SUB     R2,R0                   ;MAKE MSG ADR REL
003334' 010022                  MOV     R0,(R2)+                ;STORE MSG ADR
003336' 010112                  MOV     R1,(R2)                 ;STORE MSG'S BYTE COUNT
003340' 100001                  BPL     10$                     ;CNT NEG? (Y,N-10$)
003342' 005412                  NEG     (R2)                    ;MAKE IT POSITIVE
003344' 016367  000006  000144  10$:    MOV     PASCIN(R3),PROGNM       ;STORE PROG'S # IN MSG
003352' 004577  174476          JSR     R5,@CLIST               ;ISSUE PROG #
003356' 000136                  .WORD   PNUMSG-.
003360' 000005                  .WORD   5
003362' 004577  174466          JSR     R5,@CLIST               ;ISSUE MSG SPECIFIED
003366' 000000          20$:    .WORD   XXXX
003370' 000000                  .WORD   XXXX
003372' 004577  174456          JSR     R5,@CLIST               ;ISSUE A <CR> & <LF>
003376' 000254                  .WORD   CRLF-.
003400' 000002                  .WORD   2
003402' 000410                  BR      PRTEX                   ;GO TO EXIT
003404' 010067  000010  40$:    MOV     R0,50$                  ;STORE MSG'S ABS ADR
003410' 010167  000006          MOV     R1,60$                  ;STORE ITS BYTE CNT
003414' 004577  174432          JSR     R5,@ULIST               ;GO TO MPG TO ISSUE THE MSG
003420' 000000          50$:    .WORD   XXXX
003422' 000000          60$:    .WORD   XXXX
003424' 000205          PRTEX:  RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;TEST READ INTERRUPT VECTOR S/R
                                        ;
003426' 016767  174374  000010  TRVECT: MOV     IVCTAD,20$              ;GET CURR INT VECT ADR
003434' 016346  000004          MOV     PFWADR(R3),-(SP)        ;STORE FLGWD ADR TO IDENTIFY ME
003440' 004577  174426          JSR     R5,@TSTVEC              ;DO I HAVE VECTOR CONTROL?
003444' 000000          20$:    .WORD   XXXX                    ;   MPG WILL TELL ME SINCE I CAN'T
003446' 176314                  .WORD   RDINT-.                 ;   GET AT LOWER MEM IF MEM MGMT
003450' 000401                  BR      TRVEXT                  ;BR IF I DONT HAVE CONTROL
003452' 005725                  TST     (R5)+                   ;BYPASS BR INST IN S/R CALL
003454' 000205          TRVEXT: RTS     R5                      ;EXIT IN-LINE
                                        ;
                                        ;TEST WRITE INTERRUPT VECTOR S/R
                                        ;
003456' 016767  174344  000016  TWVECT: MOV     IVCTAD,20$              ;GET CURR INT VECT ADR
003464' 062767  000004  000010          ADD     #4,20$                  ;ADJUST FOR WRITE INT
```

```
 814  003472' 016346 000004          MOV     PFWADR(R3),-(SP)        ;STORE FLGWD ADR TO IDENTIFY ME
 815  003476' 004577 174370          JSR     R5,@TSTVEC              ;DO I HAVE VECTOR CONTROL?
 816  003502' 000000          20$:   .WORD   XXXX                    ;   MPG WILL TELL ME SINCE I CAN'T
 817  003504' 176044                 .WORD   WRINT-.                 ;   GET AT LOWER MEM IF MEM MGMT
 818  003506' 000401                 BR      TWVEXT                  ;BR IF I DONT HAVE CONTROL
 819  003510' 005725                 TST     (R5)+                   ;BYPASS BR INST IN S/R CALL
 820  003512' 000205          TWVEXT: RTS     R5                      ;RETURN IN-LINE
```

```
                                        .SBTTL  MESSAGE STORAGE AREA
                                        .NLIST  BEX
                                        .EVEN
003514' 021520                  PNMMSG: .ASCII  /P#/
003516' 054130      011         PROGNM: .ASCII  /XX/<011>
003521'    101  020124  040514  ATIMSG: .ASCII  /AT LAST INT:/
003535'    103  051125  042522  CURMSG: .ASCII  /CURRENTLY:/
003547'    105  042116  047440  RENDMG: .ASCII  /END OF REPORT/
                                        .EVEN
003564' 054130  054130  020075  DVRGMG: .ASCII  /XXXX= /
003572' 054130  054130  054130  DVRGDT: .ASCII  /XXXXXX/

003600' 054502  042524  035123  CNTSMG: .ASCII  /BYTES:  RD= /
003614' 054130  054130  054130  BCMRD:  .ASCII  /XXXXXXXXXXXX  WR= /
003636' 054130  054130  054130  BCMWR:  .ASCII  /XXXXXXXXXXXX/
003652' 005015                  CRLF:   .ASCII  <015><012>

003654' 041411  047115  051504          .ASCII  <011>/CMNDS:  RD= /
003671'    130  054130  054130  CMDCRD: .ASCII  /XXXXXX WR= /
003704' 054130  054130  054130  CMDCWR: .ASCII  /XXXXXX MISC= /
003721'    130  054130  054130  CMDCMS: .ASCII  /XXXXXX/<015><012>
003731'    011  047111  042524          .ASCII  <011>/INTERRUPTS:  RD= /
003753'    130  054130  054130  RDINMS: .ASCII  /XXXXXX WR= /
003766' 054130  054130  054130  WRINMS: .ASCII  /XXXXXX/<015><012>

003776' 042411  051122  051117  ERRMSG: .ASCII  <011>/ERRORS:  READER= /
004020' 054130  054130  054130  ERROR:  .ASCII  /XXXXXX PUNCH= /
004036' 054130  054130  054130  ERRPUN: .ASCII  /XXXXXX/<015><012>
004046' 020011  020040  020040          .ASCII  <011>/          DATA ERRORS = /
004076' 054130  054130  054130  ERCDTA: .ASCII  /XXXXXX/
        004104'                 CNTSEN= .
                                        .EVEN

                                        .LIST   BEX

        004104'                 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

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

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

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

```
1055            000062                  DVPDTA= +50.    ;CONVERT PACKED DECIMAL TO ASCII BR ADR (DECASC) - 1 WORD
1056
1057            000064                  DVSFWD= +52.    ;MPG SYSTEM FLAGWORD ADDRESS (CSYSFW) - 1 WORD
1058
1059            000066                  DVSVEC= +54.    ;SET INTERRUPT VECTOR BR ADR (SETVEC) - 1 WORD
1060
1061            000070                  DVCVEC= +56.    ;CLEAR INTERRUPT VECTOR BR ADR (CLRVEC) - 1 WORD
1062
1063            000072                  DVTVEC= +58.    ;TEST INTERRUPT VECTOR BR ADR (TSTVEC) - 1 WORD
1064
1065            000074                  DVRINT= +60.    ;RETURN FROM INTERRUPT BR ADR (RTNINT) - 1 WORD
1066
1067            000076                  DVGETB= +62.    ;GET DATA BYTE BR ADR (GETBYT) - 1 WORD
1068
1069            000100                  DVPUTB= +64.    ;PUT DATA BYTE BR ADR (PUTBYT) - 1 WORD
1070
1071            000102                  DEVSTP= +66.    ;DEVICE ROUT REL SYMBOL TABLE POINTER - 1 WORD
1072
1073            000104                  DEVETP= +68.    ;DEVICE ROUT REL ENTRY TABLE POINTER - 1 WORD
1074
1075            000106                  DVPTEP= +70.    ;PACK TABLE EXTEN. REL POINTER - 1 WORD
1076
1077            000110                  DVVTEP= +72.    ;VECTOR TABLE EXTEN. REL POINTER - 1 WORD
1078
1079            000112                  DVCTEP= +74.    ;COMPILER TBL EXTEN. REL POINTER - 1 WORD
1080
1081            000114                  DVIWSP= +76.    ;DEVICE INTERFACE WORD SYMBOL TBL REL POINTER - 1 WORD
1082
1083            000116                  DRTEND= +78.    ;END OF DEVICE ROUTINE TABLE
1084
1085
1086
1087            000001                  .END
```

```
ABRREY  002512R   002   DEVIW8= 000022          ERRPUN  004036R   002   PPS     000356R   002   RENDMG  003547R   002
ACTIVE= 100000          DEVMPS= 000030          ERROR   004020R   002   PRB     000354R   002   REPORT  002254R   002
ATIMSG  003521R   002   DEVRSZ= 000000          ERRPT   002544R   002   PRDIOA= 000016          REPTBL  002514R   002
AURPEP= 000010          DEVSTP= 000102          ERRSUM  002654R   002   PRINT   003312R   002   RERVEC  002144R   002
AUTORP= 000020          DEVWPS= 000032          ERRTST  001456R   002   PROGNM  003516R   002   RESREG  003102R   002
BCMRD   003614R   002   DHKPAD= 000034          ERSTOP= 000004          PRONER= 020000          RETURN  001342R   002
BCMWR   003636R   002   DISCNT  002402R   002   ERTBEN  002536R   002   PRS     000352R   002   RICNT   000410R   002
BINASC  000056R   002   DISPST  003222R   002   FLAG    000424R   002   PRTEX   003424R   002   RPTBAS  002446R   002
BIT11 = 004000          DKILAD= 000040          FLAGWD  001002R   002   PSRC  = 000120          RPTEND  002472R   002
BIT12 = 010000          DOERCK= 000400          GETBYT  000076R   002   PSRCST= 000022          RPTLP   002430R   002
BIT6  = 000100          DOIOT = 000040          GTNXTD= 001000          PSTKCT= 000124          RRINTV  002156R   002
BLANK   001344R   002   DREGAD  000024R   002   GTPTBS  000756R   002   PSTKSV= 000126          RTERM   002100R   002
BTASLZ  000060R   002   DRTEND= 000116          GVECAD  001742R   002   PSVREG= 000222          RTNINT  000074R   002
BYRD    000372R   002   DRTLTH= 000116          HSKEEP  002220R   002   PTEM0 = 000056          RWINTV  002174R   002
BYWR    000376R   002   DRWAIT= 100000          HSKPEN= 000426R   002   PTEM1 = 000060          R0      =%000000
CIOBSY  000046R   002   DTOERD= 000044          HSKPEP= 000004          PTEM10= 000102          R1      =%000001
CLIST   000054R   002   DVBTDA= 000060          HSKPST= 000352R   002   PTEM11= 000104          R2      =%000002
CLRERR  001202R   002   DVCMDS  000146R   002   INTEXT  001750R   002   PTEM12= 000106          R3      =%000003
CLRVCT= 000002          DVCPRT= 000054          ISTAT = 000352R   002   PTEM13= 000110          R4      =%000004
CLRVEC  000070R   002   DVCPTE  000300R   002   IVCTAD  000026R   002   PTEM14= 000112          R5      =%000005
CLWVCT= 000004          DVCTEP= 000112          KILL    000544R   002   PTEM15= 000114          SAVREG  003066R   002
CMDCMS  003721R   002   DVCVEC= 000070          KILLEX  000642R   002   PTEM2 = 000062          SETBSY  001134R   002
CMDCRD  003671R   002   DVGETB= 000076          LCOUNT  000346R   002   PTEM3 = 000064          SETDED= 000040
CMDCWR  003704R   002   DVIWSP= 000114          LDRFLG= 000001          PTEM4 = 000066          SETVEC  000066R   002
CNTSEN= 004104R   002   DVIWST  000344R   002   LDRYES  001250R   002   PTEM5 = 000070          SIZE    000020R   002
CNTSMG  003600R   002   DVMVTE  000254R   002   LEADER  001062R   002   PTEM6 = 000072          SP      =%000006
CRLF    003652R   002   DVPDTA= 000062          LLDR    000347R   002   PTEM7 = 000074          SPOPER= 000200
CSTAT   000362R   002   DVPKTE  000204R   002   LNWAIT  000346R   002   PTEM8 = 000076          SRDBSY  000716R   002
CSYSFW  000064R   002   DVPTEP= 000106          LOCZ    000000R   002   PTEM9 = 000100          STMNMG  003050R   002
CTPRIO= 000020          DVPUTB= 000100          LSTATS  000346R   002   PTEND = 000242          STMNT   002754R   002
CUPGER  000050R   002   DVREGE= 000146R   002   LWAIT   000346R   002   PTLGTH= 000242          STMNUM  003060R   002
CURMSG  003535R   002   DVREGS  000116R   002   MISCNT  000406R   002   PTOCNT= 000030          STONER= 100000
CWRINT  000614R   002   DVREND= 004104R   002   MNVER = 000001          PTSIZE= 000240          STPPUN  001712R   002
CYCDVL= 002000          DVREX   002502R   002   NOCOMP= 000001          PUNEBL  001310R   002   STPRDR  002114R   002
CYCPRG= 040000          DVRGDT  003572R   002   NOWAIT  001526R   002   PUNERR  000416R   002   STSTAT  003140R   002
DATAER  000420R   002   DVRGMG  003564R   002   OCPRES= 000100          PUNRDY  001614R   002   SUPTAD  003120R   002
DECASC  000062R   002   DVRINT= 000074          PASCIN= 000006          PUSRPC= 000236          TOECNT  000422R   002
DECTAD= 000042          DVSFWD= 000064          PC      =%000007        PUTBYT  000100R   002   TOEMSG  000514R   002
DERPAD= 000036          DVSVEC= 000066          PCURDV= 000035          PWRIOA= 000020          TOUTER  000426R   002
DEVBTA= 000156          DVTVEC= 000072          PDNUMS= 000036          PSCONS= 120000          TOUTEX  000506R   002
DEVDER= 000050          DVUPRT= 000052          PDPNTR= 000034          RADDR   001536R   002   TRMTST  001376R   002
DEVDRA= 000024          DVVTEP= 000110          PDST  = 000122          RBUSRQ  000030R   002   TRVECT  003426R   002
DEVETP= 000104          EMSGBF  003000R   002   PFBBOV= 000002          RBYTES  001540R   002   TRVEXT  003454R   002
DEVFWD= 000002          EMSGHD  002756R   002   PFLGWD= 000000          RDBSY = 020000          TSTIEB  001360R   002
DEVIOB= 000046          ERCDTA  004076R   002   PFWADR= 000004          RDCNT   000402R   002   TSTVEC  000072R   002
DEVIVA= 000026          ERCDTB  002736R   002   PLNGTH= 000026          RDINMS  003753R   002   TWVECT  003456R   002
DEVIW1= 000004          ERDIAG  002646R   002   PMDLCD= 000032          RDINT   001762R   002   TWVEXT  003512R   002
DEVIW2= 000006          ERMBCT  002644R   002   PNAME = 000010          RDMNST  000776R   002   ULIST   000052R   002
DEVIW3= 000010          ERR     000022R   002   PNBR  = 000116          RDNOWT  001042R   002   URSTOP= 000002
DEVIW4= 000012          ERRDIS  002554R   002   PNMMSG  003514R   002   RDRERR  000414R   002   USEUBM= 000200
DEVIW5= 000014          ERREXT  001514R   002   POBJST= 000024          RDRRDY  002024R   002   WADDR   001542R   002
DEVIW6= 000016          ERRFLG  001546R   002   POPSW = 000002          READ    000654R   002   WAIT    001346R   002
DEVIW7= 000020          ERRMSG  003776R   002   PPB     000360R   002   RELEAS  001520R   002   WBUSRQ  000032R   002
```

D03

```
MAINDEC-11-DTPCA-B     PC11/PR11 DEVICE ROUTINE FOR MPG        MACY11 27(732)  24-SEP-76  14:10  PAGE 9-1              SEQ 0029
DTPCAB.P11     SYMBOL TABLE

WBYTES  001544R     002   WRBSY = 040000          WRINT   001550R     002   WT4IOT= 000010          .     = 004104R     002

. ABS.  000000      000
        000000      001
PC11    004104      002


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 *,DTPCAB/NL:TOC/DOC=DTPCAB.P11
 RUN-TIME:  3 6 1 SECONDS
 RUN-TIME RATIO: 35/11=3.1
 CORE USED:  5K  (9 PAGES)

 DOCUMENT PAGES:  29
```