DL11

DEVICE ROUTINE FOR MPR

MD-11-DTDLA-B

EP DTDLA B DL A

NOV 1976

FICHE 1 OF 1

digital

MADE IN USA

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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DTDLA-B
PRODUCT NAME:	DL11 DEVICE ROUTINE FOR MPG
DATE:	APRIL 1976
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	W. R. GREENE


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                                .SBTTL  REVISION HISTORY

                        :       APR 76          DTDLA-B RELEASE
                        :       JAN 76          ADDED MEMORY MANAGEMENT SUPPORT
                        :       AUG 75          DTDLA-A INITIAL RELEASE
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                                        .SBTTL  STANDARD DEVICE ROUTINE TABLE
                                        .TITLE  MAINDEC-11-DTDLA-B      DL11 DEVICE ROUTINE FOR MPG

                                        ;REVISION B

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

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


            000000'                     .CSECT  DL11
                                        .DSABL  GBL

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

  000000' 005022            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
            000010                    BRFLG=  10                      ;  BREAK INST FLAG
            000004                    CLWVCT= 4                       ;  CLEAR WRITE VECTOR FLAG
            000002                    CLRVCT= 2                       ;  CLEAR READ VECTOR 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' 175610            DREGAD:   .WORD   175610                  ;FIRST DEVICE REGISTER ADR
  000026' 000300            IVCTAD:   .WORD   300                     ;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' 002744                      .WORD   HSKEEP-.                ;HOUSEKEEPING ROUT REL ADR
  000036' 002776                      .WORD   REPORT-.                ;REPORT ROUT REL ADR
  000040' 000766                      .WORD   KILL-.                  ;KILL ROUT REL ADR
  000042' 000644                      .WORD   DATAER-.                ;DATA ERROR COUNTER REL ADR
  000044' 000650                      .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
  000070' 000000            CLRVEC:   .WORD   0                       ;CLEAR INT VECTOR ROUT BR ADR
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                                ;TEST INT VECTOR ROUT BR ADR
                                ;RETURN FROM INT ROUT BR ADR
                                ;GET DATA BYTE ROUT BR ADR
                                ;PUT DATA BYTE ROUT BR ADR
                                ;ADR OF DEVICE REGISTER NAMES
                                ;ADR OF DEVICE FUNCTIONS
                                ;ADR OF PACK TBL EXTENSION
                                ;ADR OF MODEL VECTOR TBL EXTEN.
                                ;ADR OF COMPILER TBL EXTEN.
                                ;ADR OF DEV INTERFACE WD SYM TBL

                                ;VALID DEVICE REGISTER NAMES &
                                ;THEIR POSITIONS RELATIVE TO
                                ;THE DEVICE REGISTERS BASE ADDRESS.

                                ;VALID DEVICE FUNCTIONS
                                ;  FLAG BYTE:
                                ;     BIT 7 = NPR DEV
                                ;     BIT 3 = MASSBUS DEV
                                ;     BIT 0 = 2 WORDS FOR ADR
                                ;             (18 BIT ADRS)

                                ;TABLE TERMINATOR
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```
000250' 051103  051505  052105  DVPKTE: .ASCII  /CRESET/                        ;PACK TABLE EXTENSION
000256'    376     000                  .BYTE   376,0
000260' 047516  040527  052111          .ASCII  /NOWAIT/
000266'    375     000                  .BYTE   375,0
000270' 020040  040527  052111          .ASCII  /  WAIT/
000276'    374     000                  .BYTE   374,0
000300' 052123  052101  051525          .ASCII  /STATUS/
000306'    373     000                  .BYTE   373,0
000310' 047503  047125  051524          .ASCII  /COUNTS/
000316'    372     000                  .BYTE   372,0
000320' 020040  040503  046114          .ASCII  /  CALL/
000326'    371     000                  .BYTE   371,0
000330' 044514  052123  047105          .ASCII  /LISTEN/
000336'    370     000                  .BYTE   370,0
000340' 047101  053523  051105          .ASCII  /ANSWER/
000346'    367     000                  .BYTE   367,0
000350' 040510  043516  050125          .ASCII  /HANGUP/
000356'    366     000                  .BYTE   366,0
000360' 020040  042523  042116          .ASCII  /  SEND/
000366'    365     000                  .BYTE   365,0
000370' 020040  042522  053103          .ASCII  /  RECV/
000376'    364     000                  .BYTE   364,0
000400' 051040  051104  047117          .ASCII  / RDRON/
000406'    363     000                  .BYTE   363,0
000410' 042122  047522  043106          .ASCII  /RDROFF/
000416'    362     000                  .BYTE   362,0

000420' 000376  000632          DVMVTE: .WORD   376,LCRST-LOCZ          ;MODEL VECTOR TABLE EXTENSION
000424' 000375  000632                  .WORD   375,LNWAIT-LOCZ
000430' 000374  000632                  .WORD   374,LWAIT-LOCZ
000434' 000373  000632                  .WORD   373,LSTATS-LOCZ
000440' 000372  000632                  .WORD   372,LCOUNT-LOCZ
000444' 000371  000632                  .WORD   371,LCALL-LOCZ
000450' 000370  000632                  .WORD   370,LLISEN-LOCZ
000454' 000367  000632                  .WORD   367,LANSWR-LOCZ
000460' 000366  000632                  .WORD   366,LHNGUP-LOCZ
000464' 000365  000632                  .WORD   365,LSEND-LOCZ
000470' 000364  000632                  .WORD   364,LRECV-LOCZ
000474' 000363  000632                  .WORD   363,LRDRON-LOCZ
000500' 000362  000632                  .WORD   362,LRDROF-LOCZ

                                ;
                                ;       COMPILER TABLE EXTENSION
                                ;
000504'    003     376          DVCPTE: .BYTE   3,376                           ;CONTROL RESET
000506' 004537  000012                  .WORD   4537,10.
000512'    003     375                  .BYTE   3,375                           ;NO WAIT
000514' 004537  000012                  .WORD   4537,10.
000520'    003     374                  .BYTE   3,374                           ;WAIT
000522' 004537  000012                  .WORD   4537,10.
000526'    004     373                  .BYTE   4,373                           ;STATUS
000530' 004537  000012  001002          .WORD   4537,10.,1002
000536'    004     372                  .BYTE   4,372                           ;COUNTS
000540' 004537  000012  001001          .WORD   4537,10.,1001
000546'    003     371                  .BYTE   3,371                           ;CALL
000550' 004537  000012                  .WORD   4537,10.
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000554' 003 370                 .BYTE   3,370                   ;LISTEN
000556' 004537 000012           .WORD   4537,10.
000562' 003 367                 .BYTE   3,367                   ;ANSWER
000564' 004537 000012           .WORD   4537,10.
000570' 003 366                 .BYTE   3,366                   ;HANGUP
000572' 004537 000012           .WORD   4537,10.
000576' 003 365                 .BYTE   3,365                   ;SEND
000600' 004537 000012           .WORD   4537,10.
000604' 003 364                 .BYTE   3,364                   ;RECEIVE
000606' 004537 000012           .WORD   4537,10.
000612' 003 363                 .BYTE   3,363                   ;READER ON
000614' 004537 000012           .WORD   4537,10.
000620' 003 362                 .BYTE   3,362                   ;READER OFF
000622' 004537 000012           .WORD   4537,10.
000626' 177777                  .WORD   177777                  ;TABLE END

                        ;
                        ;       DEVICE INTERFACE WORD SYMBOL TABLE
                        ;
000630' 177777          DVIWST: .WORD   177777                  ;TABLE END

                        ;
                        ;       MODEL STATEMENT TABLE EXTENSION
                        ;
000632'                 LCRST:
000632'                 LNWAIT:
000632'                 LWAIT:
000632'                 LSTATS:
000632'                 LCOUNT:
000632'                 LCALL:
000632'                 LLISEN:
000632'                 LANSWR:
000632'                 LHNGUP:
000632'                 LSEND:
000632'                 LRECV:
000632'                 LRDRON:
000632'     000         LRDROF: .BYTE   0
            000634'             .EVEN

            000634'     HSKPST= .
            000634'     ISTAT=  .                               ;STORAGE FOR DEV REG'S AT INT
000634' 000000          RCSR:   .WORD   0
000636' 000000          RBUF:   .WORD   0
000640' 000000          XCSR:   .WORD   0
000642' 000000          XBUF:   .WORD   0

000644' 000004          CSTAT:  .BLKW   4                       ;DEV REG CURRENT VALUE STORAGE

000654' 000000          BYRD:   .WORD   0                       ;BYTES READ COUNT
000656' 000000                  .WORD   0
000660' 000000          BYWR:   .WORD   0                       ;BYTES WRITTEN COUNT
000662' 000000                  .WORD   0
000664' 000000          RDCNT:  .WORD   0                       ;READ CMND COUNT
000666' 000000          WRCNT:  .WORD   0                       ;WRITE CMND COUNT
000670' 000000          BKCNT:  .WORD   0                       ;BREAK CMND COUNT
000672' 000000          MISCNT: .WORD   0                       ;MISC. CMND COUNT (CRESET,
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                                                                ;CALL,LISTEN,ANSWER,HANGUP,SEND,RECV)
000674' 000000          RICNT:  .WORD   0                       ;READ INTERRUPT COUNT
000676' 000000          WICNT:  .WORD   0                       ;WRITE INTERRUPT COUNT
000700' 000000          OVRRUN: .WORD   0                       ;OVERRUN ERRORS COUNT
000702' 000000          FRAMER: .WORD   0                       ;FRAMING ERRORS COUNT
000704' 000000          PARERR: .WORD   0                       ;PARITY ERRORS COUNT
000706' 000000          DATAER: .WORD   0                       ;DATA ERROR COUNT
000710' 000000          TOECNT: .WORD   0                       ;# OF ENTRIES INTO T/O ERROR ROUT

000712' 000000          FLAG:   .WORD   0                       ;FLAGWORD STORAGE


                000714' HSKPEN= .

                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
                000002  USMTPS= 2                               ;MTPS INST LEGAL FLAG
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                                        .SBTTL  DL11 FUNCTION ROUTINES
                                        ;TIMEOUT ERROR HANDLER
000714' 005267  177770          TOUTER: INC     TOECNT                  ;INCR TIME OUT ERROR COUNT
000720' 026727  177764  000010          CMP     TOECNT,#8.              ;EXCEEDED 8 TIMEOUTS?
000726' 001401                          BEQ     2$                      ;YES - CONTINUE
000730' 000205                          RTS     R5                      ;NO - RETURN
000732' 004067  002714          2$:     JSR     R0,SAVREG               ;SAVE REGISTERS
000736' 004767  002742                  JSR     PC,SUPTAD               ;P TBL ADR TO R3
000742' 005004                          CLR     R4
000744' 042713  000010                  BIC     #WT4IOT,(R3)
000750' 004567  003202                  JSR     R5,PRINT                ;PRINT TIMEOUT ERR MSG
000754' 000026                          .WORD   TOEMSG-.
000756' 000023                          .WORD   19.
000760' 004567  000042                  JSR     R5,KILL                 ;KILL THE PROGRAM
000764' 004767  002442                  JSR     PC,ERDIRG               ;DISPLAY STATUS & STMNT #
000770' 004067  002672                  JSR     R0,RESREG               ;RESTORE REGISTERS
000774' 012605                  TOUTEX: MOV     (SP)+,R5                ;GO DISPLAY DEVICE REGS
000776' 000177  177046                  JMP     @CUPGER

001002' 046104  030461  052040  TOEMSG: .ASCII  'DL11 TIMEOUT ON I/O'
001010' 046511  047505  052125
001016' 047440  020116  027511
001024'     117
        001026'                         .EVEN
                                        ;KILL USER PROGRAM ROUTINE
001026' 016702  176772          KILL:   MOV     DREGAD,R2               ;GET DEV REG ADR
001032' 032762  000100  000004          BIT     #100,4(R2)              ;XMIT INT EBL SET?
001040' 001017                          BNE     CWRINT                  ;YES-CLEAR
001042' 032712  000100          TSRINT: BIT     #100,(R2)               ;RECV INT SET?
001046' 001432                          BEQ     KILLEX                  ;NO-EXIT
001050' 004567  003216                  JSR     R5,TRVECT               ;TEST READ INT VECTOR
001054' 000411                          BR      CWRINT                  ;BRANCH IF NOT ME
001056' 004567  001026                  JSR     R5,HANGUP               ;DISCONNECT LINE
001062' 042712  000100                  BIC     #100,(R2)               ;RESET RD INT EBL
001066' 042767  020000  176706          BIC     #RDBSY,FLAGWD           ;RESET READ BSY IN FLAG WD
001074' 004767  001636                  JSR     PC,RRINTV               ;RESET INT VECTOR INFO
001100' 004567  003216          CWRINT: JSR     R5,TWVECT               ;TEST WRITE INT VECTOR
001104' 000756                          BR      TSRINT                  ;BRANCH IF NOT ME
001106' 004567  000776                  JSR     R5,HANGUP               ;DISCONNECT LINE
001112' 042762  000100  000004          BIC     #100,4(R2)              ;RESET WR INT EBL
001120' 042767  040000  176654          BIC     #WRBSY,FLAGWD           ;RESET WRITE BSY IN FLAG WD
001126' 004767  001622                  JSR     PC,RWINTV               ;RESET INT VECTOR INFO
001132' 000743                          BR      TSRINT
001134' 005067  176662          KILLEX: CLR     ERR                     ;CLEAR ERROR INDICATOR
001140' 000205                          RTS     R5                      ;RETURN
                                        ;READ COMMAND HANDLER
001142' 010567  002400          READ:   MOV     R5,STMNT                ;SAVE R5
001146' 162767  000004  002372          SUB     #4,STMNT                ;FOR STMNT # REFERENCE
001154' 016704  176644                  MOV     DREGAD,R4               ;DEV REG ADDR TO R4
001160' 032714  000100                  BIT     #100,(R4)               ;TEST RECV INT EBL
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                                        BEQ     SRDBSY                  ;CONTINUE IF NOT SET
                                        JSR     R5,@CIOBSY              ;OTHERWISE RELEASE CONTROL
                                        BR      READ
                        SRDBSY:         BIS     #RDBSY,FLAGWD           ;SET READ BUSY
                                        MOV     IVCTAD,10$              ;INT VECTOR ADDR TO CALL
                                        MOV     RBUSRQ,20$              ;ALSO BUS PRIORITY
                                        JSR     R5,@SETVEC              ;GO SET THE VECTOR
                        10$:            .WORD   XXXX
                        20$:            .WORD   XXXX
                                        .WORD   RDINT-.
                        GTPTBS:         JSR     PC,SUPTAD               ;GET P TBL BASE IN R3
                                        CLR     ERR                     ;CLEAR ERROR INDICATOR
                                        INC     RDCNT                   ;INCR READ CMD COUNT
                                        BIT     #SPOPER,POPSW(R3)       ;TEST MAINT BIT IN OPSW
                                        BEQ     RDMNCL
                                        BIS     #4,4(R4)                ;SET RCSR BIT TO SAME STATE
                                        BR      RDMNST
                        RDMNCL:         BIC     #4,(R4)
                        RDMNST:         MOV     (R5)+,R0                ;GET ADDRESS
                                        MOV     (R5)+,RADDR
                                        MOV     (R5)+,RBYTES            ;BYTE COUNT AND
                                        MOV     (R5)+,R0                ;LINE NBR FROM CALL
                                        BIS     #WT4IOT,PFLGWD(R3)      ;SET WAIT FOR I/O TERM
                        SETRSE:         BIS     #100,(R4)               ;SET RECEIVE INT ENABLE
                                        BIT     #DRWAIT,FLAGWD          ;TEST DEV ROUT NOWAIT
                                        BNE     RDNOWT                  ;BRANCH IF SET
                                        JMP     TSTIEB                  ;OTHERWISE WAIT
                        RDNOWT:         BIC     #WT4IOT,PFLGWD(R3)      ;CLEAR WAIT FOR I/O TERM
                                        RTS     R5                      ;RETURN INLINE

                                ;WRITE AND BREAK COMMAND HANDLER

                        WRITE:          BIC     #BRFLG,FLAGWD           ;CLEAR BREAK FLAG
                                        BR      XMIT
                        BREAK:          BIS     #BRFLG,FLAGWD           ;SET BREAK FLAG
                        XMIT:           MOV     R5,STMNT                ;SAVE R5
                                        SUB     #4,STMNT                ;FOR STMNT # REFERENCE
                                        MOV     DREGAD,R4               ;DEV REG ADDR TO R4
                                        BIT     #100,4(R4)              ;TEST XMIT INT EBL
                                        BEQ     SETBSY                  ;CONTINUE IF NOT SET
                                        JSR     R5,@CIOBSY              ;OTHERWISE RELEASE CONTROL
                                        BR      XMIT
                        SETBSY:         BIS     #WRBSY,FLAGWD           ;SET WRITE BUSY
                                        MOV     IVCTAD,10$              ;INT VECTOR ADDR TO CALL
                                        ADD     #4,10$                  ;ADJUST FOR WRITE INT
                                        MOV     WBUSRQ,20$              ;ALSO PASS BUS PRIORITY
                                        JSR     R5,@SETVEC              ;GO SET THE VECTOR
                        10$:            .WORD   XXXX
                        20$:            .WORD   XXXX
                                        .WORD   WRINT-.
                                        JSR     PC,SUPTAD               ;GET P TBL BASE IN R3
                                        CLR     ERR                     ;CLEAR ERROR INDICATOR
                                        BIT     #SPOPER,POPSW(R3)       ;TEST MAINT BIT IN OPSW
                                        BEQ     WRMNCL
                                        BIS     #4,4(R4)                ;SET XCSR BIT TO SAME STATE
                                        BR      WRMNST
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001506' 042714  000004          WRMNCL: BIC     #4,(R4)
001512' 012500                  WRMNST: MOV     (R5)+,R0                ;GET ADDRESS
001514' 012567  000542                  MOV     (R5)+,WADDR
001520' 012567  000540                  MOV     (R5)+,WBYTES            ;BYTE COUNT AND
001524' 012500                          MOV     (R5)+,R0                ;LINE NBR FROM CALL
001526' 042764  000001  000004          BIC     #1,4(R4)                ;CLEAR BREAK BIT
001534' 032767  000010  176240          BIT     #BRFLG,FLAGWD           ;TEST BREAK FLAG
001542' 001406                          BEQ     IWC
001544' 052764  000001  000004          BIS     #1,4(R4)                ;SET BREAK IF FLG =1
001552' 005267  177112                  INC     BKCNT                   ;INCREMENT BREAK CNT
001556' 000402                          BR      SETTSE
001560' 005267  177102          IWC:    INC     WRCNT                   ;INCREMENT WRITE CNT
001564' 052763  000010  000000  SETTSE: BIS     #WT4IOT,PFLGWD(R3)      ;SET WAIT FOR I/O TERM
001572' 052764  000100  000004          BIS     #100,4(R4)              ;SET XMIT INT EBL
001600' 032767  100000  176174          BIT     #DRWAIT,FLAGWD          ;TEST DEV ROUT NOWAIT
001606' 001411                          BEQ     TSTIEB                  ;IF RESET TEST INT EBL
001610' 042763  000010  000000          BIC     #WT4IOT,PFLGWD(R3)      ;CLEAR WAIT FOR I/O TERM
001616' 000205                  RETURN: RTS     R5                      ;RETURN INLINE

                                        ;WAIT COMMAND HANDLER

001620' 042767  100000  176154  WAIT:   BIC     #DRWAIT,FLAGWD          ;CLEAR DEV ROUT NOWAIT
001626' 016704  176172                  MOV     DREGAD,R4               ;POINT R4 AT REG ADDR
001632' 032714  000100          TSTIEB: BIT     #100,(R4)               ;TEST RECV INT
001636' 001055                          BNE     RELEAS                  ;IF SET, RELEASE CONTROL
001640' 032764  000100  000004          BIT     #100,4(R4)              ;TEST XMIT INT
001646' 001051                          BNE     RELEAS                  ;IF SET, RELEASE CONTROL
001650' 032767  000002  176124  TRMTST: BIT     #CLRVCT,FLAGWD          ;TEST IF VECTOR CLR REQD
001656' 001410                          BEQ     10$                     ;BRANCH IF NOT
001660' 004567  002406                  JSR     R5,TRVECT               ;TEST READ VECTOR
001664' 000405                          BR      10$                     ;BRANCH IF NOT ME
001666' 004767  001044                  JSR     PC,RRINTV               ;GO RESET THE VECTOR
001672' 042767  000002  176102          BIC     #CLRVCT,FLAGWD          ;CLEAR THE REQ FLAG
001700' 032767  000004  176074  10$:    BIT     #CLWVCT,FLAGWD          ;TEST IF VECTOR CLR REQD
001706' 001410                          BEQ     ERRTST                  ;BRANCH IF NOT
001710' 004567  002406                  JSR     R5,TWVECT               ;TEST WRITE VECTOR
001714' 000405                          BR      ERRTST                  ;BRANCH IF NOT ME
001716' 004767  001032                  JSR     PC,RWINTV               ;GO RESET THE VECTOR
001722' 042767  000004  176052          BIC     #CLWVCT,FLAGWD          ;CLEAR THE REQ FLAG
001730' 005767  000334          ERRTST: TST     ERRFLG                  ;TEST FOR ANY ERROR
001734' 001730                          BEQ     RETURN                  ;RETURN IF NONE
001736' 012767  000001  176056          MOV     #1,ERR                  ;SET ERROR INDICATOR
001744' 004767  001734                  JSR     PC,SUPTAD
001750' 032763  020000  000002          BIT     #PRONER,POPSW(R3)       ;TEST DONT PRINT ON ERR BIT
001756' 001003                          BNE     ERREXT                  ;EXIT IF SET
001760' 005004                          CLR     R4
001762' 000167  001342                  JMP     ERRRPT
001766' 000177  176056          ERREXT: JMP     @CUPGER
001772' 004577  176050          RELEAS: JSR     R5,@CIOBSY              ;OTHERWISE RELEASE CONTROL
001776' 000715                          BR      TSTIEB

                                        ;NOWAIT COMMAND HANDLER

002000' 052767  100000  175774  NOWAIT: BIS     #DRWAIT,FLAGWD          ;SET NOWAIT FLAG
002006' 000703                          BR      RETURN
```

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                                        ;CRESET COMMAND HANDLER
                                        
002010' 016704  176010          CRESET: MOV     DREGAD,R4
002014' 005014                          CLR     (R4)            ;CLEAR ALL CONTROL BITS
002016' 005064  000004                  CLR     4(R4)
002022' 005067  175774                  CLR     ERR             ;CLEAR ERROR INDICATOR
002026' 000205                          RTS     R5              ;RETURN
```

```
                                        ;CALL & ANSWER COMMAND HANDLER
                                        ;
002030'                         CALL:
002030' 016704  175770          ANSWER: MOV     DREGAD,R4
002034' 052714  000002                  BIS     #2,(R4)             ;SET DTR
002040' 032714  010000                  BIT     #10000,(R4)         ;TEST CARRIER DETECT
002044' 001003                          BNE     CALLOK              ;EXIT WHEN DETECTED
002046' 004577  175774                  JSR     R5,@CIOBSY          ;ELSE RELEASE CONTROL
002052' 000766                          BR      CALL
002054' 005267  176612          CALLOK: INC     MISCNT
002060' 000205                          RTS     R5                  ;RETURN INLINE
                                        ;
                                        ;LISTEN COMMAND HANDLER
                                        ;
002062' 016704  175736          LISTEN: MOV     DREGAD,R4
002066' 032714  040000                  BIT     #40000,(R4)         ;TEST RING IND
002072' 001003                          BNE     RANG                ;EXIT WHEN  DETECTED
002074' 004577  175746                  JSR     R5,@CIOBSY          ;ELSE RELEASE CONTROL
002100' 000770                          BR      LISTEN
002102' 005267  176564          RANG:   INC     MISCNT
002106' 000205                          RTS     R5                  ;RETURN INLINE
                                        ;
                                        ;HANGUP COMMAND HANDLER
                                        ;
002110' 016704  175710          HANGUP: MOV     DREGAD,R4
002114' 042714  000004          DISCON: BIC     #4,(R4)             ;LOWER RTS
002120' 012700  000017                  MOV     #15.,R0
002124' 012701  000553          HNGDL1: MOV     #363.,R1            ;DELAY 15 MS
002130' 005301                  HNGDL2: DEC     R1
002132' 001376                          BNE     HNGDL2
002134' 005300                          DEC     R0
002136' 001372                          BNE     HNGDL1
002140' 042714  000002                  BIC     #2,(R4)             ;LOWER DTR
002144' 005267  176522                  INC     MISCNT
002150' 000205                          RTS     R5                  ;RETURN INLINE
                                        ;
                                        ;SEND COMMAND HANDLER
                                        ;
002152' 016704  175646          SEND:   MOV     DREGAD,R4
002156' 052714  000004                  BIS     #4,(R4)             ;RAISE RTS
002162' 032714  020000                  BIT     #20000,(R4)         ;TEST CTS
002166' 001003                          BNE     SENDOK              ;EXIT WHEN SET
002170' 004577  175652                  JSR     R5,@CIOBSY          ;ELSE RELEASE CONTROL
002174' 000766                          BR      SEND
002176' 005267  176470          SENDOK: INC     MISCNT
002202' 000205                          RTS     R5                  ;RETURN INLINE
                                        ;
                                        ;RECV COMMAND HANDLER
                                        ;
002204' 016704  175614          RECV:   MOV     DREGAD,R4
002210' 042714  000004                  BIC     #4,(R4)             ;LOWER RTS
002214' 005267  176452          RECVOK: INC     MISCNT
002220' 000205                          RTS     R5                  ;RETURN INLINE
```

```
                                        ;READER ON COMMAND HANDLER
                                        
002222' 016704  175576          RDRON:  MOV     DREGAD,R4
002226' 052714  000001                  BIS     #1,(R4)                 ;TURN READER ON
002232' 005267  176434                  INC     MISCNT
002236' 000205                          RTS     R5                      ;RETURN INLINE
                                        
                                        ;READER OFF COMMAND HANDLER
                                        
002240' 016704  175560          RDROFF: MOV     DREGAD,R4
002244' 042714  000001                  BIC     #1,(R4)                 ;TURN READER OFF
002250' 005267  176416                  INC     MISCNT
002254' 000205                          RTS     R5                      ;RETURN INLINE
                                        
002256' 000000                  RADDR:  .WORD   0
002260' 000000                  RBYTES: .WORD   0
002262' 000000                  WADDR:  .WORD   0
002264' 000000                  WBYTES: .WORD   0
002266' 000000                  RCR:    .WORD   0                       ;RECEIVE CONT REG
002270' 000000                  ERRFLG: .WORD   0                       ;ERROR FLAG
```

```
                                        ;WRITE INTERRUPT HANDLER
                                        ;
002272' 004067 001354           WRINT:  JSR     R0,SAVREG               ;SAVE REGISTERS
002276' 004567 001422                   JSR     R5,STSTAT               ;STORE DEVICE REG CONTENTS
002302' 176332                          .WORD   ISTAT-.
002304' 005267 176366                   INC     WICNT                   ;INCR WRITE INTERRUPT CNT
002310' 004767 001370                   JSR     PC,SUPTAD               ;SET INTERNAL PTRS
002314' 005767 177744                   TST     WBYTES                  ;TEST BYTE COUNT
002320' 001422                          BEQ     WTERM                   ;BRANCH IF ZERO
002322' 010703                          MOV     PC,R3
002324' 062703 177736                   ADD     #WADDR-.,R3
002330' 011300                          MOV     (R3),R0
002332' 105733                          TSTB    @(R3)+
002334' 004777 175536                   JSR     PC,@GETBYT
002340' 110164 000006                   MOVB    R1,6(R4)
002344' 010701                          MOV     PC,R1
002346' 062701 176314                   ADD     #BYWR+2-.,R1
002352' 062711 000001                   ADD     #1,(R1)                 ;INCR BYTES WRITTEN BY 1
002356' 005541                          ADC     -(R1)
002360' 005313                          DEC     (R3)                    ;DECREMENT BYTE COUNT
002362' 005243                          INC     -(R3)                   ;INCREMENT ADDRESS
002364' 000431                          BR      INTEXT                  ;RETURN FROM INTERRUPT
002366' 042764 000001 000004    WTERM:  BIC     #1,4(R4)                ;CLEAR BREAK BIT
002374' 042767 040000 175400            BIC     #WRBSY,FLAGWD           ;RESET WRITE BUSY
002402' 042764 000100 000004            BIC     #100,4(R4)              ;RESET XMIT INT EBL
002410' 010701                          MOV     PC,R1
002412' 062701 176250                   ADD     #BYWR+2-.,R1
002416' 011167 175376                   MOV     (R1),SIZE               ;UPDATE ACTUAL BYTES XFERRED
002422' 004767 001256                   JSR     PC,SUPTAD
002426' 032714 000100                   BIT     #100,(R4)               ;RECEIVE INT STILL UP ?
002432' 001003                          BNE     GVECAD                  ;YES - CONTINUE
002434' 042763 000010 000000            BIC     #WT4IOT,PFLGWD(R3)      ;NO - RESET WAIT FOR IOT
002442' 052767 000004 175332    GVECAD: BIS     #CLWVCT,FLAGWD          ;SET CLR VECT REQUEST
002450' 004067 001212           INTEXT: JSR     R0,RESREG               ;RESTORE REGISTERS
002454' 000177 175414                   JMP     @#TINT                  ;RETURN FROM INTERRUPT
```

```
                                                ;READ INTERRUPT HANDLER
                                                ;
                                                ;READ INTERRUPT HANDLER
                                                ;
002460' 004067  001166          RDINT:  JSR     R0,SAVREG               ;SAVE REGISTERS
002464' 004567  001234                  JSR     R5,STSTAT               ;STORE DEVICE REG CONTENTS
002470' 176144                          .WORD   ISTAT-.
002472' 005267  176176                  INC     RICNT
002476' 004767  001202                  JSR     PC,SUPTAD               ;SET INTERNAL PTRS
002502' 016401  000002                  MOV     2(R4),R1                ;GET DATA FROM RBUF
002506' 010102                          MOV     R1,R2                   ;SAVE IN R2
002510' 005767  177544                  TST     RBYTES                  ;TEST BYTE COUNT
002514' 001454                          BEQ     RTERM                   ;BRANCH IF ZERO
002516' 010701                          MOV     PC,R1
002520' 062701  176136                  ADD     #BYRD+2-.,R1
002524' 062711  000001                  ADD     #1,(R1)                 ;INCR BYTES READ BY 1
002530' 005541                          ADC     -(R1)
002532' 005067  177532                  CLR     ERRFLG
002536' 032702  010000                  BIT     #10000,R2               ;TEST FOR PARITY ERROR
002542' 001405                          BEQ     NOPERR                  ;BRANCH IF NOT
002544' 005267  176134                  INC     PARERR                  ;OTHERWISE INCR COUNT
002550' 152767  000001  177512          BISB    #1,ERRFLG               ;REMEMBER PARITY ERROR
002556' 032702  020000          NOPERR: BIT     #20000,R2               ;TEST FOR FRAMING ERROR
002562' 001405                          BEQ     NOFERR                  ;BRANCH IF NOT
002564' 005267  176112                  INC     FRAMER                  ;OTHERWISE INCR COUNT
002570' 152767  000002  177472          BISB    #2,ERRFLG               ;REMEMBER FRAMING ERROR
002576' 032702  040000          NOFERR: BIT     #40000,R2               ;TEST FOR OVERRUN ERROR
002602' 001405                          BEQ     NOOERR                  ;BRANCH IF NOT
002604' 005267  176070                  INC     OVRRUN                  ;OTHERWISE INCR COUNT
002610' 152767  000004  177452          BISB    #4,ERRFLG               ;REMEMBER OVERRUN ERROR
002616' 010703          NOOERR: MOV     PC,R3
002620' 062703  177436                  ADD     #RADDR-.,R3
002624' 011300                          MOV     (R3),R0
002626' 110201                          MOVB    R2,R1
002630' 004777  175244                  JSR     PC,@PUTBYT              ;PUT BYTE IN MEMORY
002634' 005213                          INC     (R3)                    ;INCREMENT ADDRESS
002636' 005363  000002                  DEC     2(R3)                   ;DECREMENT BYTE COUNT
002642' 001401                          BEQ     RTERM                   ;TERMINATE IF BC ZERO
002644' 000701                          BR      INTEXT
002646' 042767  020000  175126  RTERM: BIC     #RDBSY,FLAGWD           ;RESET READ BUSY
002654' 042714  000100                  BIC     #100,(R4)               ;RESET READ INT EBL
002660' 010701                          MOV     PC,R1
002662' 062701  175774                  ADD     #BYRD+2-.,R1
002666' 011167  175126                  MOV     (R1),SIZE               ;UPDATE ACTUAL BYTES XFERRED
002672' 004767  001006                  JSR     PC,SUPTAD
002676' 032764  000100  000004          BIT     #100,4(R4)              ;TEST IF WRITE STILL UP
002704' 001003                          BNE     COMBER                  ;IF YES-GO COMBINE ERRORS
002706' 042763  000010  000000          BIC     #WT4IOT,PFLGWD(R3)      ;RESET WAIT FOR IOT
002714' 032763  000400  000002  COMBER: BIT     #DOERCK,POPSW(R3)       ;TEST DONT ERROR CK BIT
002722' 001000                          BNE     RERVEC                  ;BRANCH IF SET
002724' 052767  000002  175050  RERVEC: BIS     #CLRVCT,FLAGWD          ;SET CLR RD VECT REQUEST
002732' 000167  177512                  JMP     INTEXT                  ;EXIT
                                                ;
                                                ;
002736' 016767  175064  000004  RRINTV: MOV     IVCTAD,10$              ;RESET READ VECT SUBR
```

```
642  002744' 004577  175120                    JSR     R5,@CLRVEC
643  002750' 000000                  10$:      .WORD   XXXX
644  002752' 000207                            RTS     PC
645
646
647  002754' 016767  175046  000012  RWINTV:  MOV     IVCTAD,10$              ;RESET WRITE VECT SUBR
648  002762' 062767  000004  000004            ADD     #4,10$
649  002770' 004577  175074                    JSR     R5,@CLRVEC
650  002774' 000000                  10$:      .WORD   XXXX
651  002776' 000207                            RTS     PC
```

```
                                        .SBTTL  DL11 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

003000' 005725                  HSKEEP: TST     (R5)+                   ;UNCONDITIONALLY DO HSKP?
003002' 001003                          BNE     10$                     ;N,Y-10$
003004' 032702  000004                  BIT     #HSKPEP,R2              ;OPSW SPECIFY EACH PASS HSKP?
003010' 001010                          BNE     30$                     ;Y,N-30$
003012' 010700                  10$:    MOV     PC,R0                   ;SET UP FIRST WD ADR
003014' 062700  175620                  ADD     #HSKPST-.,R0
003020' 012701  000030                  MOV     #HSKPEN-HSKPST/2,R1     ;SET UP # OF WORDS
003024' 005020                  20$:    CLR     (R0)+                   ;HSKP ALL NECESSARY AREAS
003026' 005301                          DEC     R1
003030' 001375                          BNE     20$
003032' 000205                  30$:    RTS     R5                      ;EXIT IN-LINE


                                        ;DL11 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

003034' 005067  000232          REPORT: CLR     ABBREV                  ;CLR ABBREVIATED RPT FLAG
003040' 004067  000606                  JSR     R0,SAVREG               ;SAVE REG'S R0 - R5
003044' 032715  177776                  BIT     #177776,(R5)            ;DISPLAYING CNTS AT END OF
003050' 001012                          BNE     8$                      ;PROG PASS? (Y,N-8$)
003052' 010700                          MOV     PC,R0                   ;SET UP ADR OF CNTS
003054' 062700  175600                  ADD     #BYRD-.,R0
003060' 012701  000016                  MOV     #14.,R1                 ;GET # OF CNT WORDS
003064' 005720                  2$:     TST     (R0)+                   ;THIS CNT WORD = 0?
003066' 001003                          BNE     8$                      ;Y,N-8$
003070' 005301                          DEC     R1                      ;DECR WORD CNT
003072' 001374                          BNE     2$                      ;CK'ED ALL WORDS? (Y,N-2$)
003074' 000472                          BR      DVREX                   ;GO TO EXIT -- ALL CNTS ARE 0'S
003076' 004767  000602          8$:     JSR     PC,SUPTAD               ;SET UP PROG TBL ADR IN R3
003102' 012604                          MOV     (R5)+,R4                ;GET FLAGWORD
003104' 032704  000002                  BIT     #2,R4                   ;GOING TO DO STATUS DISPLAY?
003110' 001403                          BEQ     10$                     ;Y,N-10$
003112' 004567  000606                  JSR     R5,STSTAT               ;GO STORE STATUS REG'S
003116' 175526                          .WORD   CSTAT-.
003120' 032704  000002          10$:    BIT     #2,R4                   ;DISPLAY DEV STATUS?
003124' 001416                          BEQ     DISCNT                  ;Y,N-DISCNT
003126' 004567  001024                  JSR     R5,PRINT                ;ISSUE 'AT INT' MSG
003132' 001233                          .WORD   ATIMSG-.
003134' 000014                          .WORD   12.
```

F02


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003136' 004567  000634             JSR     R5,DISPST            ;GO DISPLAY STATUS AT LAST INT
003142' 175472                     .WORD   ISTAT-.
003144' 004567  001006             JSR     R5,PRINT             ;ISSUE 'CURRENTLY' MSG
003150' 001231                     .WORD   CURMSG-.
003152' 000012                     .WORD   10.
003154' 004567  000616             JSR     R5,DISPST            ;GO DISPLAY CURRENT STATUS
003160' 175464                     .WORD   CSTAT-.
003162' 032704  000001    DISCNT:  BIT     #1,R4                ;DISPLAY COUNTS?
003166' 001431                     BEQ     RPTEND               ;Y,N-RPTEND
003170' 012700  000016             MOV     #14.,R0              ;SET UP # OF WORDS
003174' 010701                     MOV     PC,R1                ;SET UP ADR OF CNTS
003176' 062701  175456             ADD     #BYRD-.,R1
003202' 010702                     MOV     PC,R2                ;SET UP TBL ADR
003204' 062702  000070             ADD     #REPTBL-.,R2
003210' 012267  000012    RPTLP:   MOV     (R2)+,RPTBAS         ;MOV MSG ADR TO S/R LINKAGE
003214' 004067  000432             JSR     R0,SAVREG            ;SAVE ALL REG'S
003220' 011100                     MOV     (R1),R0              ;GET CURRENT COUNT
003222' 004577  174630             JSR     R5,@BINASC           ;CONVERT IT TO ASCII
003226' 000000            RPTBAS:  .WORD   XXXX
003230' 004067  000432             JSR     R0,RESREG            ;RESTORE REG'S
003234' 005721                     TST     (R1)+                ;POINT AT NXT CNT
003236' 005300                     DEC     R0                   ;DONE ALL WORDS?
003240' 001363                     BNE     RPTLP                ;Y,N-RPTLP
003242' 004567  000710             JSR     R5,PRINT             ;GO ISSUE COUNTS MSG
003246' 001224                     .WORD   CNTSMG-.
003250' 000330                     .WORD   CNTSEN-CNTSMG
003252' 004567  000700    RPTEND:  JSR     R5,PRINT             ;ISSUE "END OF REPORT" MSG
003256' 001135                     .WORD   RENDMG-.
003260' 177763                     .WORD   -13.
003262' 004067  000400    DVREX:   JSR     R0,RESREG            ;RESTORE REGISTERS
003266' 005725                     TST     (R5)+                ;SET UP RETURN POINT
003270' 000205                     RTS     R5                   ;EXIT IN-LINE

003272' 000000            ABBREV:  .WORD   0


003274' 001260            REPTBL:  .WORD   BCMRD-RPTBAS
003276' 001266                     .WORD   BCMRD+6-RPTBAS
003300' 001302                     .WORD   BCMWR-RPTBAS
003302' 001310                     .WORD   BCMWR+6-RPTBAS
003304' 001335                     .WORD   CMDCRD-RPTBAS
003306' 001350                     .WORD   CMDCWR-RPTBAS
003310' 001364                     .WORD   CMDCBK-RPTBAS
003312' 001401                     .WORD   CMDCMS-RPTBAS
003314' 001432                     .WORD   RDINMS-RPTBAS
003316' 001445                     .WORD   WRINMS-RPTBAS
003320' 001500                     .WORD   ERCOVR-RPTBAS
003322' 001520                     .WORD   ERCFRM-RPTBAS
003324' 001537                     .WORD   ERCPAR-RPTBAS
003326' 001566                     .WORD   ERCDTA-RPTBAS
```

```
                                        ;DL11 ERROR REPORT ROUTINE

003330' 004767  000004          ERRRPT: JSR     PC,ERRDIS
003334' 000177  174510                  JMP     @CUPGER
003340' 010701                  ERRDIS: MOV     PC,R1                   ;POINT R1 AT ERR MSG
003342' 062701  000222                  ADD     #EMSGBF-.,R1
003346' 012767  000014  000054          MOV     #12.,ERMBCT
003354' 010700                          MOV     PC,R0                   ;POINT R0 AT ERR MSG TBL
003356' 062700  000144                  ADD     #ERCDTB-.,R0
003362' 105710                  1$:     TSTB    (R0)
003364' 001416                          BEQ     ERTBEN                  ;BRANCH IF R0 AT TBL END
003366' 132067  176676                  BITB    (R0)+,ERRFLG            ;TEST FOR PARTICULAR ERR
003372' 001003                          BNE     3$                      ;BRANCH IF FOUND
003374' 062700  000005          2$:     ADD     #5,R0
003400' 000770                          BR      1$
003402' 012702  000005          3$:     MOV     #5,R2
003406' 112021                  4$:     MOVB    (R0)+,(R1)+             ;MOVE MSG CODE TO ERR MSG
003410' 005267  000014                  INC     ERMBCT                  ;BUMP BYTE COUNT
003414' 005302                          DEC     R2
003416' 001373                          BNE     4$
003420' 000760                          BR      1$                      ;CHECK IF MORE
003422' 004567  000530          ERTBEN: JSR     R5,PRINT                ;PRINT ERROR MSG
003426' 000122                          .WORD   EMSGHD-.
003430' 000014                  ERMBCT: .WORD   12.
003432' 004567  000340          ERDIRG: JSR     R5,DISPST               ;DISPLAY DEVICE REGS
003436' 175176                          .WORD   ISTAT-.
003440' 016300  000022          ERRSNM: MOV     PSRCST(R3),R0           ;GET ADDR OF SRC STMNTS
003444' 111001                  10$:    MOVB    (R0),R1                 ;SAVE STMNT LENGTH
003446' 026067  000004  000072          CMP     4(R0),STMNT             ;ERROR OCCUR ON THIS STMNT?
003454' 001402                          BEQ     20$                     ;YES - BRANCH
003456' 060100                          ADD     R1,R0                   ;POINT AT NEXT STATEMENT
003460' 000771                          BR      10$                     ;GO CK NEXT STMNT
003462' 005720                  20$:    TST     (R0)+                   ;SET UP ADR OF STMNT # DATA
003464' 010701                          MOV     PC,R1                   ;SET UP DATA OUTPUT ADDR
003466' 062701  000156                  ADD     #STMNUM-.,R1
003472' 004577  174364                  JSR     R5,@DECASC              ;CONVERT IT TO ASCII
003476' 012767  020040  000144          MOV     #20040,STMNUM+4         ;SET 2 LOW DIGITS TO SPACES
003504' 004567  000446                  JSR     R5,PRINT                ;ISSUE STMNT # MSG
003510' 000124                          .WORD   STMNMG-.
003512' 177762                          .WORD   -14.
003514' 005067  176550                  CLR     ERRFLG                  ;CLEAR ERROR FLAG
003520' 000207                          RTS     PC

003522' 020001  050040  051101  ERCDTB: .ASCII  <001>/  PAR/
003530' 020002  043040  046522          .ASCII  <002>/  FRM/
003536' 020004  047440  051126          .ASCII  <004>/  OVR/
003544'     000                         .BYTE   0
        003546'                         .EVEN
003546' 000000                  STMNT:  .WORD   0                       ;SAVED R5 FOR STMNT #
003550' 046104  030461  042440  EMSGHD: .ASCII  /DL11 ERROR: /
003556' 051122  051117  020072
003564' 000050                  EMSGBF: .BLKB   40.
003634' 052123  047115  020124  STMNMG: .ASCII  /STMNT # /
003642' 020043
003644' 054130  054130  054130  STMNUM: .ASCII  /XXXXXX/
```

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                                        .SBTTL  SUBROUTINES FOR DL11 DEVICE ROUTINE
                                        ;SAVE REGISTERS R0 THRU R5
                                                ;JSR    R0,SAVREG       S/R CALL
003652' 010146                  SAVREG: MOV     R1,-(SP)                ;SAVE R0 THRU R5
003654' 010246                          MOV     R2,-(SP)
003656' 010346                          MOV     R3,-(SP)
003660' 010446                          MOV     R4,-(SP)
003662' 010546                          MOV     R5,-(SP)
003664' 010007                          MOV     R0,PC                   ;EXIT IN-LINE
                                        ;RESTORE REGISTERS R0 THRU R5
                                                ;JSR    R0,RESREG       S/R CALL
003666' 005726                  RESREG: TST     (SP)+                   ;RESTORE R4 THRU R0
003670' 012605                          MOV     (SP)+,R5
003672' 012604                          MOV     (SP)+,R4
003674' 012603                          MOV     (SP)+,R3
003676' 012602                          MOV     (SP)+,R2
003700' 012601                          MOV     (SP)+,R1
003702' 000200                          RTS     R0                      ;EXIT IN-LINE
                                        ;SET PROGRAM'S PROG TABLE ADR IN R3
                                                ;JSR    PC,SUPTAD       S/R CALL
003704' 010703                  SUPTAD: MOV     PC,R3                   ;SET UP LOCATION ZERO ADR
003706' 062703  174072                  ADD     #LOCZ-.,R3
003712' 166303  177776                  SUB     -2(R3),R3               ;SUBTRACT PROG TBL LENGTH
003716' 016704  174102                  MOV     DREGAD,R4               ;PUT DEV REG ADR IN R4
003722' 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
003724' 016701  174074          STSTAT: MOV     DREGAD,R1
003730' 042711  002000                  BIC     #2000,(R1)              ;SELECT TCR
003734' 010500                          MOV     R5,R0                   ;GET REL STORAGE ADR & MAKE
003736' 062500                          ADD     (R5)+,R0                ;IT ABSOLUTE
003740' 012746  000004                  MOV     #DVREGE-DVREGS/6,-(SP)  ;GET # OF REG'S TO STORE
003744' 010702                          MOV     PC,R2                   ;GET ADR OF 1ST REG DISPLACEMENT
003746' 062702  174154                  ADD     #DVREGS+4-.,R2
003752' 011201                  10$:    MOV     (R2),R1                 ;GET REG DISPLACEMENT
003754' 066701  174044                  ADD     DREGAD,R1               ;ADD IN REG'S BASE ADR
003760' 011120                          MOV     (R1),(R0)+              ;STORE REGISTER VALUE
003762' 062702  000006                  ADD     #6,R2                   ;POINT AT NXT DISPLACEMENT
003766' 005316                          DEC     (SP)                    ;DECR REG CNT
```

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003770' 001370                  BNE     10$                     ;DONE ALL? (Y,N-10$)
003772' 005726                  TST     (SP)+                   ;CLEAN UP THE STACK
003774' 000205                  RTS     R5                      ;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

003776' 010502          DISPST: MOV     R5,R2                   ;GET REL DATA ADR
004000' 062502                  ADD     (R5)+,R2                ;MAKE IT ABS
004002' 010701                  MOV     PC,R1                   ;SET UP ADR OF REG NAMES IN ASCII
004004' 062701  174112          ADD     #DVREGS-.,R1
004010' 012700  000004          MOV     #DVREGE-DVREGS/6,R0     ;GET # OF REGISTERS TO DISPLAY
004014' 012167  000436  10$:    MOV     (R1)+,DVRGMG            ;MOVE REG NAME TO MSG
004020' 012167  000434          MOV     (R1)+,DVRGMG+2
004024' 005721                  TST     (R1)+                   ;BYPASS DISP VALUE
004026' 004067  177620          JSR     R0,SAVREG               ;SAVE REG'S R0 - R5
004032' 011200                  MOV     (R2),R0                 ;GET REG'S STORED VALUE
004034' 004577  174016          JSR     R5,@BINASC              ;CONVERT IT TO ASCII
004040' 000424                  .WORD   DVRGDT-.
004042' 004567  000110          JSR     R5,PRINT                ;PRINT THE STATUS MSG
004046' 000410                  .WORD   DVRGMG-.
004050' 000014                  .WORD   12.
004052' 004067  177610          JSR     R0,RESREG               ;RESTORE R0 - R4
004056' 005722                  TST     (R2)+                   ;POINT AT NXT REG VALUE
004060' 005300                  DEC     R0                      ;DECR REG CNT
004062' 001354                  BNE     10$                     ;DONE ALL? (Y,N-10$)
004064' 000205                  RTS     R5                      ;EXIT IN-LINE


                                ;DISPLAY CURRENT UNIT #

                                ;JSR    PC,DISUNM       S/R CALL
                                ;R3 MUST CONTAIN PROG TBL ADR
                                ;DESTROYS R0,R1,R2

004066' 012767  000022  000056  DISUNM: MOV     #18.,DISUML             ;INIT TO NORM MSG LNTH
004074' 116300  000035          MOVB    PCURDV(R3),R0           ;GET CURRENT UNIT #
004100' 020027  000020          CMP     R0,#16.                 ;VALID UNIT #?
004104' 101007                  BHI     DISUIV                  ;Y,N-DISUIV
004106' 004577  173746          JSR     R5,@BTASLZ              ;CONVERT # TODECIMAL ASCII
004112' 000336                  .WORD   UNASCI-.
004114' 016767  000334  000326  MOV     UNASCI+4,UNASCI         ;MOVE ASCII # TO 1ST TWO DIGITS
004122' 000410                  BR      DISUPR
004124' 012767  000026  000020  DISUIV: MOV     #22.,DISUML             ;SET UP ERR COND MSG LNTH
004132' 042700  177400          BIC     #177400,R0              ;RESET HIGH BYTE
004136' 004577  173714          JSR     R5,@BINASC              ;CONVERT BINARY TO ASCII
004142' 000306                  .WORD   UNASCI-.
004144' 004567  000006          DISUPR: JSR     R5,PRINT                ;GO ISSUE UNIT # MSG
004150' 000260                  .WORD   UNITMG-.
004152' 000020                  DISUML: .WORD   16.
004154' 000207                  RTS     PC                      ;EXIT INLINE
```

```
                                        ;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
                                        ;
004156' 010500          PRINT:  MOV     R5,R0           ;GET MSG ADR & MAKE IT ABS
004160' 062500                  ADD     (R5)+,R0
004162' 012501                  MOV     (R5)+,R1        ;GET BYTE COUNT
004164' 005704                  TST     R4              ;USE CMND MODE PRINT?
004166' 100030                  BPL     40$             ;Y,N-40$
004170' 010702                  MOV     PC,R2           ;SET UP LINK INFO ADR
004172' 062702  000040          ADD     #20$-.,R2
004176' 160200                  SUB     R2,R0           ;MAKE MSG ADR REL
004200' 010022                  MOV     R0,(R2)+        ;STORE MSG ADR
004202' 010112                  MOV     R1,(R2)         ;STORE MSG'S BYTE COUNT
004204' 100001                  BPL     10$             ;CNT NEG? (Y,N-10$)
004206' 005412                  NEG     (R2)            ;MAKE IT POSITIVE
004210' 016367  000006  000144  10$:    MOV     PASCIN(R3),PROGNM       ;STORE PROG'S # IN MSG
004216' 004577  173632          JSR     R5,@CLIST       ;ISSUE PROG #
004222' 000136                  .WORD   PNMMSG-.
004224' 000005                  .WORD   5
004226' 004577  173622          JSR     R5,@CLIST       ;ISSUE MSG SPECIFIED
004232' 000000          20$:    .WORD   XXXX
004234' 000000                  .WORD   XXXX
004236' 004577  173612          JSR     R5,@CLIST       ;ISSUE A <CR> & <LF>
004242' 000302                  .WORD   CRLF-.
004244' 000002                  .WORD   2
004246' 000410                  BR      PRTEX           ;GO TO EXIT
004250' 010067  000010  40$:    MOV     R0,50$          ;STORE MSG'S ABS ADR
004254' 010167  000006          MOV     R1,60$          ;STORE ITS BYTE CNT
004260' 004577  173566          JSR     R5,@ULIST       ;GO TO MPG TO ISSUE THE MSG
004264' 000000          50$:    .WORD   XXXX
004266' 000000          60$:    .WORD   XXXX
004270' 000205          PRTEX:  RTS     R5              ;EXIT IN-LINE
                                        ;
                                        ;TEST READ INTERRUPT VECTOR S/R
                                        ;
004272' 016767  173530  000010  TRVECT: MOV     IVCTAD,20$      ;GET CURR INT VECT ADR
004300' 016346  000004          MOV     PFWADR(R3),-(SP)        ;STORE FLGWD ADR TO IDENTIFY ME
004304' 004577  173562          JSR     R5,@TSTVEC      ;DO I HAVE VECTOR CONTROL?
004310' 000000          20$:    .WORD   XXXX            ;  MPG WILL TELL ME SINCE I CAN'T
004312' 176146                  .WORD   RDINT-.         ;  GET AT LOWER MEM IF MEM MGMT
004314' 000401                  BR      TRVEXT          ;BR IF I DONT HAVE CONTROL
004316' 005725                  TST     (R5)+           ;BYPASS BR INST IN S/R CALL
004320' 000205          TRVEXT: RTS     R5              ;EXIT IN-LINE
                                        ;
                                        ;TEST WRITE INTERRUPT VECTOR S/R
                                        ;
004322' 016767  173500  000016  TWVECT: MOV     IVCTAD,20$      ;GET CURR INT VECT ADR
004330' 062767  000004  000010          ADD     #4,20$          ;ADJUST FOR WRITE INT
```

```
 982  004336' 016346  000004                MOV     PFWADR(R3),-(SP)        ;STORE FLGWD ADR TI IDENTIFY ME
 983  004342' 004577  173524                JSR     R5,@TSTVEC              ;DO I HAVE VECTOR CONTROL?
 984  004346' 000000                20$:    .WORD   XXXX                    ;  MPG WILL TELL ME SINCE I CAN'T
 985  004350' 175722                        .WORD   WRINT-.                 ;  GET AT LOWER MEM IF MEM MGMT
 986  004352' 000401                        BR      TWVEXT                  ;BR IF I DONT HAVE CONTROL
 987  004354' 005725                        TST     (R5)+                   ;BYPASS BR INST IN S/R CALL
 988  004356' 000205                TWVEXT: RTS     R5                      ;RETURN IN-LINE
 989
 990
```

```
                                                    .SBTTL  MESSAGE STORAGE AREA
                                                    .NLIST  BEX
                                                    .EVEN
004360' 021520                          PNMMSG: .ASCII  /P#/
004362' 054130      011                 PROGNM: .ASCII  /XX/<011>
004365'    101  020124  040514          ATIMSG: .ASCII  /AT LAST INT:/
004401'    103  051125  042522          CURMSG: .ASCII  /CURRENTLY:/
004413'    105  042116  047440          RENDMG: .ASCII  /END OF REPORT/
                                                    .EVEN
004430' 025052  025052  042040          UNITMG: .ASCII  /**** DL11 UNIT: /
004450' 054130  054130  054130          UNASCI: .ASCII  /XXXXXX/
004456' 054130  054130  020075          DVRGMG: .ASCII  /XXXX= /
004464' 054130  054130  054130          DVRGDT: .ASCII  /XXXXXX/

004472' 054502  042524  035123          CNTSMG: .ASCII  /BYTES:  RD= /
004506' 054130  054130  054130          BCMRD:  .ASCII  /XXXXXXXXXXXX  WR= /
004530' 054130  054130  054130          BCMWR:  .ASCII  /XXXXXXXXXXXX/
004544' 005015                          CRLF:   .ASCII  <015><012>

004546' 041411  047115  051504                  .ASCII  <011>/CMNDS:  RD= /
004563'    130  054130  054130          CMDCRD: .ASCII  /XXXXXX WR= /
004576' 054130  054130  054130          CMDCWR: .ASCII  /XXXXXX BRK= /
004612' 054130  054130  054130          CMDCBK: .ASCII  /XXXXXX MISC= /
004627'    130  054130  054130          CMDCMS: .ASCII  /XXXXXX/<015><012>
004637'    011  047111  042524                  .ASCII  <011>/INTERRUPTS: RD= /
004660' 054130  054130  054130          RDINMS: .ASCII  /XXXXXX WR= /
004673'    130  054130  054130          WRINMS: .ASCII  /XXXXXX/<015><012>
004703'    011  051105  047522          ERRMSG: .ASCII  <011>/ERRORS:  OVERRUN= /
004726' 054130  054130  054130          ERCOVR: .ASCII  /XXXXXX FRAMING= /
004746' 054130  054130  054130          ERCFRM: .ASCII  /XXXXXX PARITY= /
004765'    130  054130  054130          ERCPAR: .ASCII  /XXXXXX/<015><012>
004775'    011  040504  040524                  .ASCII  <011>/DATA ERRORS = /
005014' 054130  054130  054130          ERCDTA: .ASCII  /XXXXXX/
        005022'                         CNTSEN= .
                                                    .EVEN

                                                    .LIST   BEX

        005022'                         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
```

```
1091            000032                  PMDLCD= +26.    ;DEV ROUT MODEL # CODE - 1 WORD
1092
1093            000034                  PDPNTR= +28.    ;CURRENT DEVICE NUMBER POINTER - 1 BYTE
1094
1095            000035                  PCURDV= +29.    ;CURRENT DEVICE # - 1 BYTE
1096
1097            000036                  PDNUMS= +30.    ;DEVICE NUMBERS - 16 BYTES
1098
1099            000056                  PTEM0=  +46.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1100
1101            000060                  PTEM1=  +48.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1102
1103            000062                  PTEM2=  +50.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1104
1105            000064                  PTEM3=  +52.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1106
1107            000066                  PTEM4=  +54.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1108
1109            000070                  PTEM5=  +56.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1110
1111            000072                  PTEM6=  +58.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1112
1113            000074                  PTEM7=  +60.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1114
1115            000076                  PTEM8=  +62.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1116
1117            000100                  PTEM9=  +64.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1118
1119            000102                  PTEM10= +66.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1120
1121            000104                  PTEM11= +68.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1122
1123            000106                  PTEM12= +70.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1124
1125            000110                  PTEM13= +72.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1126
1127            000112                  PTEM14= +74.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1128
1129            000114                  PTEM15= +76.    ;USER PROGRAM TEMPORARY STORAGE - 1 WORD
1130
1131            000116                  PNBR=   +78.    ;NUMBER OF BYTES TO TRANSFER ON MOVE (NBR) - 1 WORD
1132
1133            000120                  PSRC=   +80.    ;DATA SOURCE ADDRESS ON MOVE (SRC) - 1 WORD
1134
1135            000122                  PDST=   +82.    ;DATA DESTINATION ADDRESS ON MOVE (DST) - 1 WORD
1136
1137            000124                  PSTKCT= +84.    ;# OF WORDS (X 2) SAVED OFF STACK - 1 WORD
1138
1139            000126                  PSTKSV= +86.    ;STACK WORDS STORAGE AREA - 30 WORDS
1140
1141            000222                  PSVREG= +146.   ;USER'S R0 THRU R5 REGISTERS STORAGE AREA - 6 WORDS
1142
1143            000236                  PUSRPC= +158.   ;USER'S CURRENT PROGRAM COUNTER - 1 WORD
1144
```

```
                                        ;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
```

```
                000062          DVPDTA= +50.    ;CONVERT PACKED DECIMAL TO ASCII BR ADR (DECASC) - 1 WORD
                000064          DVSFWD= +52.    ;MPG SYSTEM FLAGWORD ADDRESS (CSYSFW) - 1 WORD
                000066          DVSVEC= +54.    ;SET INTERRUPT VECTOR BR ADR (SETVEC) - 1 WORD
                000070          DVCVEC= +56.    ;CLEAR INTERRUPT VECTOR BR ADR (CLRVEC) - 1 WORD
                000072          DVTVEC= +58.    ;TEST INTERRUPT VECTOR BR ADR (TSTVEC) - 1 WORD
                000074          DVRINT= +60.    ;RETURN FROM INTERRUPT BR ADR (RTNINT) - 1 WORD
                000076          DVGETB= +62.    ;GET DATA BYTE BR ADR (GETBYT) - 1 WORD
                000100          DVPUTB= +64.    ;PUT DATA BYTE BR ADR (PUTBYT) - 1 WORD
                000102          DEVSTP= +66.    ;DEVICE ROUT REL SYMBOL TABLE POINTER - 1 WORD
                000104          DEVETP= +68.    ;DEVICE ROUT REL ENTRY TABLE POINTER - 1 WORD
                000106          DVPTEP= +70.    ;PACK TABLE EXTEN. REL POINTER - 1 WORD
                000110          DVVTEP= +72.    ;VECTOR TABLE EXTEN. REL POINTER - 1 WORD
                000112          DVCTEP= +74.    ;COMPILER TBL EXTEN. REL POINTER - 1 WORD
                000114          DVIWSP= +76.    ;DEVICE INTERFACE WORD SYMBOL TBL REL POINTER - 1 WORD
                000116          DRTEND= +78.    ;END OF DEVICE ROUTINE TABLE
                000001                  .END
```

DTDLAB.P11 SYMBOL TABLE

```
ABBREV  003272R  002    DEVIW1= 000004          DVVTEP= 000110          LSTATS  000632R  002    PTEM9 = 000100
ACTIVE= 100000           DEVIW2= 000006          EMSGBF  003564R  002  LWAIT   000632R  002    PTEND = 000242
ANSWER  002030R  002    DEVIW3= 000010          EMSGHD  003550R  002  MISCNT  000672R  002    PTLGTH= 000242
ATIMSG  004365R  002    DEVIW4= 000012          ERCDTA  005014R  002  MMVER = 000001           PTOCNT= 000030
AURPEP= 000010           DEVIW5= 000014          ERCDTB  003522R  002  NOCOMP= 000001           PTSIZE= 000240
AUTORP= 000020           DEVIW6= 000016          ERCFRM  004746R  002  NOFERR  002576R  002    PUSRPC= 000236
BCMRD   004506R  002    DEVIW7= 000020          ERCOVR  004726R  002  NOOERR  002616R  002    PUTBYT  000100R  002
BCMWR   004530R  002    DEVIW8= 000022          ERCPAR  004765R  002  NOPERR  002556R  002    PWRIOA= 000020
BINASC  000056R  002    DEVRPS= 000030          ERDIRG  003432R  002  NOWAIT  002000R  002    P5CONS= 120000
BIT11 = 004000           DEVRSZ= 000000          ERMBCT  003430R  002  OCPRES= 000100           RADDR   002256R  002
BIT12 = 010000           DEVSTP= 000102          ERR     000022R  002  OVRRUN  000700R  002    RANG    002102R  002
BIT6  = 000100           DEVWPS= 000032          ERRDIS  003340R  002  PARERR  000704R  002    RBUF    000636R  002
BKCNT   000670R  002    DHKPAD= 000034          ERREXT  001766R  002  PASCIN= 000006           RBUSRQ  000030R  002
BREAK   001352R  002    DISCNT  003162R  002    ERRFLG  002270R  002  PC     =%000007         RBYTES  002260R  002
BRFLG = 000010           DISCON  002114R  002    ERRMSG  004703R  002  PCURDV= 000035           RCR     002266R  002
BTASLZ  000060R  002    DISPST  003776R  002    ERRRPT  003330R  002  PDNUMS= 000036           RCSR    000634R  002
BYRD    000654R  002    DISUIV  004124R  002    ERRSNM  003440R  002  PDPNTR= 000034           RDBSY = 020000
BYWR    000660R  002    DISUML  004152R  002    ERRTST  001730R  002  PDST   = 000122         RDCNT   000664R  002
CALL    002030R  002    DISUNM  004066R  002    ERSTOP= 000004           PFBBOV= 000002           RDINMS  004660R  002
CALLOK  002054R  002    DISUPR  004144R  002    ERTBEN  003422R  002  PFLGWD= 000000           RDINT   002460R  002
CIOBSY  000046R  002    DKILAD= 000040          FLAG    000712R  002  PFWADR= 000004           RDMNCL  001264R  002
CLIST   000054R  002    DOERCK= 000400          FLAGWD  000002R  002  PLNGTH= 000026           RDMNST  001270R  002
CLRVCT= 000002           DOIOT = 000090          FRAMER  000702R  002  PMDLCD= 000032           RDNOWT  001332R  002
CLRVEC  000070R  002    DREGAD  000024R  002    GETBYT  000076R  002  PNAME = 000010           RDROFF  002240R  002
CLWVCT= 000004           DRTEND= 000116          GTNXTD= 001000           PNBR   = 000116         RDRON   002222R  002
CMDCBK  004612R  002    DRTLTH= 000116          GTPTBS  001230R  002  PNMMSG  004360R  002    READ    001142R  002
CMDCMS  004627R  002    DRWAIT= 100000          GVECAD  002442R  002  POBJST= 000024           RECV    002204R  002
CMDCRD  004563R  002    DTOEAD= 000044          HANGUP  002110R  002  POPSW = 000002           RECVOK  002214R  002
CMDCWR  004576R  002    DVBTDA= 000060          HNGDL1  002124R  002  PRDIOA= 000016           RELEAS  001772R  002
CNTSEN= 005022R  002    DVCMDS  000146R  002    HNGDL2  002130R  002  PRINT   004156R  002    RENDMG  004413R  002
CNTSMG  004472R  002    DVCPRT= 000054          HSKEEP  003000R  002  PROGNM  004362R  002    REPORT  003034R  002
COMBER  002714R  002    DVCPTE  000504R  002    HSKPEN= 000714R  002  PRONER= 020000           REPTBL  003274R  002
CRESET  002010R  002    DVCTEP= 000112          HSKPEP= 000004           PRTEX   004270R  002    RERVEC  002724R  002
CRLF    004544R  002    DVCVEC= 000070          HSKPST= 000634R  002  PSRC   = 000120           RESREG  003666R  002
CSTAT   000644R  002    DVGETB= 000076          INTEXT  002450R  002  PSRCST= 000022           RETURN  001616R  002
CSYSFW  000064R  002    DVIWSP= 000114          ISTAT = 000634R  002  PSTKCT= 000124           RICNT   000674R  002
CTPRIO= 000020           DVIWST  000630R  002    IVCTAD  000026R  002  PSTKSV= 000126           RPTBAS  003226R  002
CUPGER  000050R  002    DVMVTE  000420R  002    IWC     001560R  002  PSVREG= 000222           RPTEND  003252R  002
CURMSG  004401R  002    DVPDTA= 000062          KILL    001026R  002  PTEM0 = 000056           RPTLP   003210R  002
CWRINT  001100R  002    DVPKTE  000250R  002    KILLEX  001134R  002  PTEM1 = 000060           RRINTV  002736R  002
CYCDVL= 002000           DVPTEP= 000106          LANSWR  000632R  002  PTEM10= 000102           RTERM   002646R  002
CYCPRG= 040000           DVPUTB= 000100          LCALL   000632R  002  PTEM11= 000104           RTNINT  000074R  002
DATAER  000706R  002    DVREGE= 000146R  002    LCOUNT  000632R  002  PTEM12= 000106           RWINTV  002754R  002
DECASC  000062R  002    DVREGS  000116R  002    LCRST   000632R  002  PTEM13= 000110           R0     =%000000
DECTAD= 000042           DVREND= 005022R  002    LHNGUP  000632R  002  PTEM14= 000112           R1     =%000001
DERPAD= 000036           DVREX   003262R  002    LISTEN  002062R  002  PTEM15= 000114           R2     =%000002
DEVBTA= 000056           DVRGDT  004464R  002    LLISEN  000632R  002  PTEM2 = 000062           R3     =%000003
DEVDER= 000050           DVRGMG  004456R  002    LNWAIT  000632R  002  PTEM3 = 000064           R4     =%000004
DEVDRA= 000024           DVRINT= 000074          LOCZ    000000R  002  PTEM4 = 000066           R5     =%000005
DEVETP= 000104           DVSFWD= 000064          LRDROF  000632R  002  PTEM5 = 000070           SAVREG  003652R  002
DEVFWD= 000002           DVSVEC= 000066          LRDRON  000632R  002  PTEM6 = 000072           SEND    002152R  002
DEVICB= 000046           DVTVEC= 000072          LRECV   000632R  002  PTEM7 = 000074           SENDOK  002176R  002
DEVIVA= 000026           DVUPRT= 000052          LSEND   000632R  002  PTEM8 = 000076           SETBSY  001414R  002
```

F03

```
MAINDEC-11-DTDLA-B     DL11 DEVICE ROUTINE FOR MPG     MACY11 27(732)  24-SEP-76  14:09  PAGE 9-1                    SEQ 0062
DTDLAB.P11      SYMBOL TABLE

SETDED= 000040            STMNUM  003644R     002   TRVEXT  004320R     002   USEUBM= 000200            WRINT   002272R     002
SETRSE  001312R     002   STONER= 100000            TSRINT  001042R     002   USMTPS= 000002            WRITE   001342R     002
SETTSE  001564R     002   STSTAT  003724R     002   TSTIEB  001632R     002   WADDR   002262R     002   WRMNCL  001506R     002
SETVEC  000066R     002   SUPTAD  003704R     002   TSTVEC  000072R     002   WAIT    001620R     002   WRMNST  001512R     002
SIZE    000020R     002   TOECNT  000710R     002   TWVECT  004322R     002   WBUSRQ  000032R     002   WTERM   002366R     002
SP      =%000006          TOEMSG  001002R     002   TWVEXT  004356R     002   WBYTES  002264R     002   WT4IOT= 000010
SPOPER= 000200            TOUTER  000714R     002   ULIST   000052R     002   WICNT   000676R     002   XBUF    000642R     002
SRDBSY  001174R     002   TOUTEX  000774R     002   UNASCI  004450R     002   WRBSY = 040000            XCSR    000640R     002
STMNMG  003634R     002   TRMTST  001650R     002   UNITMG  004430R     002   WRCNT   000666R     002   XMIT    001360R     002
STMNT   003546R     002   TRVECT  004272R     002   URSTOP= 000002            WRINMS  004673R     002   XXXX  = 000000
.       = 005022R     002

. ABS.  000000      000
        000000      001
DL11    005022      002


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 *,DTDLAB/NL:TOC/DOC=DTDLAB.P11
 RUN-TIME:  3  7.1 SECONDS
 RUN-TIME RATIO:  18/12=1.4
 CORE USED:  5K  (9 PAGES)

 DOCUMENT PAGES:  31
```

G03

Spooler runtime 5 Seconds, 24 KCS, 117 disk reads, 3 disk writes, 31 pages