```
                                        .TITLE  TSGEN -- System Generation Parameters
                                        .IDENT  /V6.3/
000000                                  .CSECT  TSGEN
                                        .ENABL  LC
                                        .DSABL  GBL
                                        .NLIST  CND
                                ;-----------------------------------------------------------------------------
                                ;  TSGEN version 6.3
                                ;
                                ;  This module contains the the definitions of system parameters
                                ;  that define the characteristics of the TSX-Plus system
                                ;  being generated.
                                ;
                                ;  Written by Phil Sherrod.
                                ;
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                                ;
                                ;
                                ;  Set FULLST to 1 for a full assembly listing.
                                ;  Set FULLST to 0 for a normal short listing.
                                ;
        000001                  FULLST  =       1
                                ;
000000                          TSGEN:
                                ;
                                ;  Global definitions
                                ;
                                        .GLOBL  MXTTCT,HANDSK,HANRCB,HANRCO
                                        .GLOBL  IOHANQ,GETUMR,FREUMR,SYPSWD,SYPSPR,TSXVRS
                                        .GLOBL  TSGEN,RDBSEC,DTYPE,NAMSEC,LNMTOP,SASECT,SMONHD
                                        .GLOBL  NPL,NSL,NLIN2,LSTHL,TNHL,NIOL,FSTIOL
                                        .GLOBL  NLINES,NLCHN,$MEMSZ,MEMPTR,PHYMEM,CFSTS,CFABLV
                                        .GLOBL  VNGR,SHRRCB,SHRRCN,SCPFHD,VNUIP,INSTBL,INSTBN
                                        .GLOBL  SPLND,SPLNF,SPLNB,VU$CL,UCLNAM,MIOBHD,DETCBS
                                        .GLOBL  SPLBHD,SFCBFH,KMNTOP,KMNHI,NESB,FASTIN
                                        .GLOBL  SDCB,SDCBND,SPLDEV,SPLDVN,UKMNAM,IOHLTM
                                        .GLOBL  NFRESB,SPLBLK,NSPLDV,VSWPSL,CLEOFS,VMXWIN
                                        .GLOBL  INVEC,RSR,RBR,TSR,TTCSCH,VSLEDT,FRKINI,FRKGEN
                                        .GLOBL  TBR,INRECV,OTRECV,LSTPL,LUNAME,LSTIOL,NUMFRK,NXIVMH
                                        .GLOBL  QUAN1,QUAN2,LSTMX,R$TTOP,R$INST,LSTLIN,R$CFST
        .GLOBL  INMXV,OTMXV,PVSPBL,LMXLN,LMXPRM,NDVRCB
        .GLOBL  OTRASZ,LNMAP,LNPRIM,LPRI,VLDSYS,NSPLFL,NSPLBL
        .GLOBL  CLVERS,CLORSZ,VMXMON,MONFQH,SPSTAT,LDVERS
        .GLOBL  NCSILO,NCXOFF,NCXON,CSHALC,VUXIFL
        .GLOBL  LSTSL,FSTSL,CTRLTT,VINABT,IOABFL
        .GLOBL  MAXSEC,VEDIT,WILDFL,VPRIVR,CLXTRA,CLTOTL
        .GLOBL  SWDBLK,TMIOL,TMIOH,TK1CNT,TK1SEC,NSCP
        .GLOBL  TMSWPL,TMSWPH,TMIOWL,TMIOWH,VCSHNB
        .GLOBL  DCTOTU,DCTRD,DCCRD,DCTWR,DCCWR
        .GLOBL  SFCB,SFCBND,QUAN1A,LOGCHN,QUAN1B
        .GLOBL  TSXSIT,CFCHAN,NUCHN,MVSIZ,VQUN1C,VNRFLG
        .GLOBL  VDISPC,VDOSPC,VDMKTP,VSYDMP,VDMTCR,MODDAT
        .GLOBL  VNCSLO,VNCXOF,VNCXON
        .GLOBL  CMFSEC,CMFTOP,VKEYMX,VSCHED,VDSKBU,MODTIM
        .GLOBL  VTSLCH,MXSPAC,PMSIZE,VVLSCH,VQUANO,VQUAN3,VVPWCH
        .GLOBL  MXRBUF,MXRING,MXBRK,MH$SCR,MH$RCR,MH$CAR
        .GLOBL  MH$BCR,MH$BAR,MH$SSR,DHBFSZ,VCXTRM,VCXCTL
        .GLOBL  VH$CSR,VH$DBR,VH$LPR,VH$LSR,RUNCHN
        .GLOBL  VH$LCR,VH$BA1,VH$BA2,VH$BCR,CDX$PI
        .GLOBL  CDX$DL,CDX$DZ,CDX$DH,CDX$VH,CDX$PC,CDX$PP
        .GLOBL  VMSCHR,VMIOSZ,RPRCSR,RPRVEC,DWTYPE,CDX$QP
        .GLOBL  VMAXMC,VMXMSG,MSGBAS,USRBAS,VMXMRB,WINBAS
        .GLOBL  NUMDCD,VNUMDC,DCAGE,NUMCDB,VMIOBF
        .GLOBL  LOKBAS,LOKMEM,TIOBAS,LOKCSH
        .GLOBL  VQUAN1,VQUN1A,VQUN1B,VQUAN2,VCORTM
        .GLOBL  MAPPAR,RDB,RDBEND,NUMRDB,MIODBG
        .GLOBL  CSHDEV,CSHDVN,VMXCSH,VNFCSH,CSHHD
        .GLOBL  MAXALC,ALCTBL,ALCEND,VOFFTM
        .GLOBL  VTMOUT,SNDBX,USPLCH,UBUSMP,MEM256
        .GLOBL  FREFRK,BOTDEV,BOTUNI,BOTCSR,MIOFLG
        .GLOBL  AUTHAN,AHEND,SNBUX,UMSYTP,VINTIO
        .GLOBL  VMXSF,VMXSFC,VMLBLK,RSFBLK,VPLAS,SEGCHN
        .GLOBL  SDCBSZ,SDBULS,SPLANM,MIONWB,INDFIL
        .GLOBL  NDL,LSTDL,FSTDL,VSWPFL,MAPUSR,R$MFMV
        .GLOBL  CORUSR,LINNUM,MUXNUM,NUMON,PVON,TOTON
        .GLOBL  STPFLG,MINTIM,RTVECT,VHIPCT,FRKDLY
        .GLOBL  SYSCHN,SYCH0,SYCH1,SYCH2,SYCH3,SYCH4,SYCH5
        .GLOBL  SYCH6,SYCH7,SYCH10,SYCH11,SYCH12,SYCH13
        .GLOBL  SYCH14,SYCH15,SYCH16,SYCH17,SYCH20
        .GLOBL  BLKEY,CHKEY,SYSDAT,DFLG,QCOMP,VPRILO,VPRIHI
        .GLOBL  SPUSR,SYUNIT,SYSVER,SYSUPD,CONFIG,MAXBLK,VPRIDF
        .GLOBL  PNAME,HANSIZ,HANENT,DVSTAT,PROSLT,VIDCSR
        .GLOBL  DEVSIZ,MAXDEV,NUMDEV,SYTIML,SYTIMH,SPLCHN,HANIOC
        .GLOBL  SWPCHN,NUMIOQ,NUMSYQ,FREIOQ,NMFREQ,INTSSZ
        .GLOBL  MONVEC,TK1VAL,VHIMEM,CCLSAV,INDSAV
        .GLOBL  INDDBL,INDTSV,INDDBS,R$INTC
        .GLOBL  SYINDX,CONFG2,SYSGEN,MAXGVL,LDDEVX,CLDEVX,C1DEVX
        .GLOBL  TMTOTL,TMTOTH,TMUSRL,TMUSRH,SYNAME
        .GLOBL  TMSWTL,TMSWTH,TMIDLL,TMIDLH,NUMCCB
        .GLOBL  VMXFIL,VECBAS,VDFMEM,SNMSHD,MXJADR
        .GLOBL  NMSNMB,NMUMB,CORTIM,RF$WRT,GENTOP
        .GLOBL  BASMAP,LOMAP,HIMAP,FREPGS
        .GLOBL  JCXPGS,MXJMEM,DFJMEM,TK5VAL,TK3SVL
        .GLOBL  R$CHN,R$DATE,R$UBAS,R$JOB,R$CH17
        .GLOBL  R$XCHN,EXTCHN,MVWDS,TTOPTS,MAPSIZ
        .GLOBL  DVFLAG,VBUSTP,QBUS,UNIBUS
        .GLOBL  VUCLMC,UCLDAT,UCLBLK,VUCLOR,SR3FLG
```

```
                                .GLOBL  SMRSIZ,SRTSIZ,CSHSIZ,MIOWHD,MIOSYQ
                                .GLOBL  PROFLG,MPARFL,PIDPTR
                                .GLOBL  PROBRK,SPOLID,VDBFLG,PROODC
                                .GLOBL  HANPAR,MHNSIZ,KUSECK,USWPCH,R$SWPC
                                .GLOBL  CA$BLK,CA$DVU,CA$HBL,CA$HFL,CA$HSH,CA$UBL,CA$UFL,CA$WCT
                                .GLOBL  CSHBFP,CSHLRU,CSHMRU,CSHFHD,CCBHD
                                .GLOBL  CASTBR,CASCBR,CASTBW,CASCUP,CASTRO,CASTWO
                                .GLOBL  CSHIO,CSHINI,CSHCLN,CSHFIN,CSHBAS,CSHVEC
                                .GLOBL  LOKVEC,LOKINI,DOOPAP,DOCOPN,SFSVST,SFRSST,DORLK
                                .GLOBL  DOTLK,DOCULK,DOULK1,DOSFCK,SFCLS,SFWRIT,CLSCDB
                                .GLOBL  DCRD1,DCRD2,LOKVEC,CLKVEC,VUSPHN,ABRTOV
                        ;
                        ;   Global references
                        ;
                                .GLOBL  ININT,DLINT,LINNUM,PROITP,FNDHRB
                                .GLOBL  SD$HLD,MUXNUM,RMNBAS,SETERR
                                .GLOBL  IOFIN,INTEN,PSW,SYNCH
                                .GLOBL  LA36,LA120,VT52,VT100,ADM3A,VT200
                                .GLOBL  DIABLO,QUME,HAZEL,TSDEFS,EXTP1,HANXMR,BLKMV,CVTPHY
                                .GLOBL  GETRTQ,QFREE,IOSTRT,FRKGET,FORKQ,QIO,QCOMPL
                                .GLOBL  SCHED,DSKBUF,IOQSIZ
                        ;---------------------------------------------------------------------
                        ;  Internal parameters
                        ;
        001166          TSXVRS  =       630.            ;TSX-Plus version number
        000010          MAXDEV  =       8.              ;Max number of devices that can be supported
        000031          NUMFRK  =       25.             ;# Fork request blocks
        000000          NXIVMH  =       0.              ;# extra interrupt vectors for mapped handlers
        000120          DETCBS  =       80.             ;# characters for detached job startup cmnd.
        000004          FRKGEN  =       4.              ;# Fork blocks in TSGEN
        000004          NMSNMB  =       4.              ;# System message buffers
        000002          NMSYMB  =       2.              ;# message buffer reserved for system use
        000024          NUCHN   =       20.             ;# I/O channels user may use
        000001          MAXMUX  =       1.              ;Max # of DZ11's, DH11's, and DHV11's
        000040          DHBFSZ  =       32.             ;# bytes for DH11 and DHV11 DMA output buffers
        000012          TTCSCH  =       10.             ;# characters printed per scheduler check
        000020          NUMIOQ  =       16.             ;# I/O queue elements
        000006          NUMSYQ  =       6.              ;# I/O queue elements reserved for system I/O
        000012          NUMCCB  =       10.             ;# data cache control blocks
        000006          NSCP    =       6.              ;# swapper command packets
        000454          INTSSZ  =       300.            ;# bytes for system interrupt stack
        000002          MIONWB  =       2.              ;Number of mapped I/O wait queue elements
        000000          MIODBG  =       0.              ;1=Force I/O mapping (debugging use only)
        000000          MPARFL  =       0.              ;1==>Enable mem parity traps, 0==>disable.
        000000          PROBRK  =       0.              ;1==>Enable ODT break on PRO printer port
        000003          PROODC  =       3.              ;Clock ticks per PI driver call
        000000          FASTIN  =       0.              ;1==>Clock driven input character processing
        000100          CLKVEC  =       100             ;Clock interrupt vector
        000006          DCAGE   =       6.              ;Shared file data cache ageing factor
        000001          KUSECK  =       1.              ;0==>Don't check for usage on INIT & SQUEEZE.
        000024          IOHLTM  =       20.             ;# 0.1 secs I/O can be held for job swapping
        000007          CLEOFS  =       7.              ;Max num of chars in CL ENDSTRING parameter
        000002          NDRTDF  =       2.              ;Number of dummy shared run-time definitions
        000000          $PRIV   =       0               ;Obsolete line-def privilege flag
        000020          $NOVLN  =       20              ;Obsolete no-virtual-line privilege flag
                        ;
                        ;----------------------------------------------------------------------
                        ;  Fork priority values.
                        ;  Unlike RT-11, TSX-Plus assigns priority values to its fork requests
                        ;  and allows higher priority fork requests to interrupt lower priority ones.
                        ;  The priority values range from 1 to 127.  The higher the numerical value,
                        ;  the higher the priority.
                        ;
                                .GLOBL  FP$RT,FP$CKT,FP$DEF,FP$IOS,FP$IOF,FP$IOA,FP$MOV
                                .GLOBL  FP$CDI,FP$CDO,FP$CK1,FP$MAX,FP$FLG,FP$PIO
                        ;
        100000          FP$FLG  =       100000          ;Flag saying this is a priority value
        100177          FP$MAX  =       FP$FLG+127.     ;Max legal fork priority
        100144          FP$RT   =       FP$FLG+100.     ;Real-time interrupts
        100106          FP$CKT  =       FP$FLG+70.      ;50/60 Hz clock interrupt processing
        100074          FP$CDI  =       FP$FLG+60.      ;Terminal character input processing
        100067          FP$CDO  =       FP$FLG+55.      ;Terminal character output processing
        100062          FP$DEF  =       FP$FLG+50.      ;Default fork priority
        100062          FP$IOF  =       FP$FLG+50.      ;I/O finish
        100062          FP$IOA  =       FP$FLG+50.      ;I/O abort entry
        100062          FP$PIO  =       FP$FLG+50.      ;PI output interrupt processing
        100036          FP$CK1  =       FP$FLG+30.      ;0.1 second clock processing
                        ;  The following fork priorities are entered from a non-interrupt state.
        100014                  FP$IOS  =       FP$FLG+12.      ;I/O initiation
        100012                  FP$MOV  =       FP$FLG+10.      ;Move data to/from cache buffer
                                ;
                                ;--------------------------------------------------------------------
                                ;  Completion routine class priorities.
                                ;  A completion routine with a higher (numerically larger) class priority
                                ;  is allowed to interrupt a lower class priority completion routine.
                                ;
                                        .GLOBL  CP$STD,CP$RT,CP$SYN
                                ;
        000001                  CP$STD  =       1               ;Standard -- I/O completion, .TIMIO, etc.
        000002                  CP$RT   =       2               ;Real-time completion routine
        000003                  CP$SYN  =       3               ;.SYNCH completion routine
                                ;
                                ;  Type codes used to identify communication device controllers
                                ;
        000000                  CDX$DL  =       0               ;DL11
        000002                  CDX$DZ  =       2               ;DZ11
        000004                  CDX$DH  =       4               ;DH11
        000006                  CDX$VH  =       6               ;DHV11
        000010                  CDX$PI  =       10              ;Console terminal on Professional
        000012                  CDX$PC  =       12              ;Communications port on Professional
        000014                  CDX$PP  =       14              ;Printer port on Professional
        000016                  CDX$QP  =       16              ;4 line Multiplexer on Professional
                                ;--------------------------------------------------------------------
        000024                  CFCHAN  =       NUCHN           ;Channel to use for command file input
        000025                  LOGCHN  =       NUCHN+1         ;Channel for log file
        000026                  USPLCH  =       NUCHN+2         ;Channel to use to write to spool file
        000027                  RUNCHN  =       NUCHN+3         ;Channel to use when loading a SAV file
        000030                  USWPCH  =       NUCHN+4         ;Channel to use to access swap file
        000031                  NLCHN   =       NUCHN+5         ;Total # channels allocated per job
        000000                  LSTMX   =       0               ;Index to last mux
        000000                  CURMX   =       0               ;Current mux #
        000000                  NUMRDB  =       0               ;Count number of shared run-times declared
        000000                  CURCDX  =       CDX$DL          ;Comm device type for current line
        000000                  DHUSE   =       0               ;Set to 1 if DH11 or DHV11 support needed
```

```
                                 ;-----------------------------------------------------------------------
                                 ;  Monitor fixed-offset value vector
                                 ;
                                 ;  Table of addresses of TSX-Plus routines.  The pointer to this vector is
                                 ;  stored at simulated RMON offset -2.
                                 ;
000000  002062'                  TSXVEC: .WORD   NUMDEV          ;  0 Ptr to word with # devices in system
000002  000560'                          .WORD   HANENT          ;  2 Vector with handler entry points
000004  000702'                          .WORD   HANPAR          ;  4 64-byte phys mem base of mapped handlers
000006  000000G                          .WORD   GETRTQ          ;  6 Routine to get a free I/O queue element
000010  000000G                          .WORD   QFREE           ; 10 Routine to free an I/O queue element
000012  000000G                          .WORD   QIO             ; 12 Routine to queue an I/O request
000014  000000G                          .WORD   IOSTRT          ; 14 Routine to requeue an I/O request
000016  000000G                          .WORD   QCOMPL          ; 16 Routine to queue a completion request
000020  000000G                          .WORD   FRKGET          ; 20 Routine to get a fork request block
000022  000000G                          .WORD   FORKQ           ; 22 Routine to queue a fork request
000024  000000G                          .WORD   IOHANQ          ; 24 Place I/O queue element on handler list
000026  000000G                          .WORD   GETUMR          ; 26 Allocate a Unibus map register
000030  000000G                          .WORD   FREUMR          ; 30 Free a Unibus map register
000032  001166                           .WORD   TSXVRS          ; 32 TSX-Plus version number
000034  000000G                          .WORD   IOQSIZ          ; 34 Size of an I/O queue element (bytes)
                                 ;
                                 ;  Macro to reserve I/O channel space.
                                 ;
                                         .MACRO  CHNRES
                                         .WORD   0,0,0,0,0
                                         .ENDM   CHNRES

                                 ;-------------------------------------------------------------------
                                 ;  Fixed-offset vector
                                 ;
                                 ;  The following vector of addresses and values corresponds to the fixed
                                 ;  offset cells in RT-11 RMON.  These cells are mapped into user
                                 ;  address space through PAR7 (160000 - 177777).
                                 ;
000036  000000'                  VECBAS: .WORD   TSXVEC          ;  -2 Pointer to vector of TSX addresses
000040  000167  000000G          MONVEC: JMP     INTEN           ;   0 Handler interrupt entry point
                                 ;
                                 ;  System channel space
                                 ;
000044                           SYSCHN:
000044                           SYCH0:  CHNRES
000056                           SYCH1:  CHNRES
000070                           SYCH2:  CHNRES
000102                           SYCH3:  CHNRES
000114                           SYCH4:  CHNRES
000126                           SYCH5:  CHNRES
000140                           SYCH6:  CHNRES
000152                           SYCH7:  CHNRES
000164                           SYCH10: CHNRES
000176                           SYCH11: CHNRES
000210                           SYCH12: CHNRES
000222                           SYCH13: CHNRES
000234                           SYCH14: CHNRES
000246                           SYCH15: CHNRES
000260                           SYCH16: CHNRES
000272                           SYCH17: CHNRES
```

```
000304                      SYCH20: CHNRES
                            ;
000316  000000              BLKEY:  .WORD   0               ;256 - # of directory block that is in core
000320  000000              CHKEY:  .WORD   0               ;260 - # of device whose dir block is in core
000322  000000              SYSDAT: .WORD   0               ;262 - System date word
000324  000000              DFLG:   .WORD   0               ;264 - Directory op is in progress
                            ;
                            ;  The following cells are documented for access by .GVAL
                            ;
000326  000100              USROFF: .WORD   HIMEM           ;266 - Base of USR
000330  000000G             QCOMP:  .WORD   IOFIN           ;270 - I/O completion handler entry point
000332  000000              SPUSR:  .WORD   0               ;272 - USR error cell
000334  000000              SYUNIT: .WORD   0               ;274 - Unit # of SY device
000336     004              SYSVER: .BYTE   4               ;276 - System version number
000337     000              SYSUPD: .BYTE   0               ;277 - Release #
000340  000000              CONFIG: .WORD   0               ;300 - System configuration word
000342                              .BLKW   5.              ;302 - 313 (unused)
000354  001750              MAXBLK: .WORD   MAXFIL          ;314 - Largest output file size
                            ;  Word 316 in TSX-Plus is reserved for specific use.  It must
                            ;  be initialized to zero and not used by the operating system.
                            ;  See the note in TSDEFS for more specific information.
000356  000000  000000              .WORD   0,0             ;316 - 321 unused
000362  000000              CORUSR: .WORD   0               ;322 - Current job number
000364  000000G                     .WORD   SYNCH           ;324 - Address of .SYNCH request routine
000366                              .BLKW   13.             ;326 - 357  unused
000420  000445                      BR      MTPS            ;360 - Move to PS routine
000422  000432                      BR      MFPS            ;362 - Move from PS routine
000424  000000              SYINDX: .WORD   0               ;364 - Device number of system device
000426  000000              CFSTS:  .WORD   0               ;366 - Command file status flags
000430  000000              CONFG2: .WORD   0               ;370 - Extended configuration word
000432  000000              SYSGEN: .WORD   0               ;372 - System generation options
000434  000002                      .WORD   2               ;374 - Size of USR
000436     014              CFABLV: .BYTE   14              ;376 - Error abort severity level
000437     003                      .BYTE   3               ;377 - Max @file nesting level
000440  000000              EMTRTN: .WORD   0               ;400 - EMT return point
000442  000000              FRKADR: .WORD   0               ;402 - Fork routine
000444  000500              PNPTR:  .WORD   PNAME-MONVEC    ;404 - Offset to permanent dev name table
000446  071677  142615      MONAME: .RAD50  /RT11XM/        ;406 - 410 - System name
000452  000000              HSUFFX: .WORD   0               ;412
000454  000000              SPSTAT: .WORD   0               ;414 - Spooler status flags
000456     000                      .BYTE   0               ;416 - Error byte for IND
000457     000              INSTA:  .BYTE   0               ;417 - IND status byte
000460  000000              $MEMSZ: .WORD   0               ;420 - Total 32-word mem blocks avail
000462  000000                      .WORD   0
000464  000442G             $TCFIG: .WORD   TTOPTS+RMNBAS   ;424 - Address of TT config word
000466  000444G             $INDDV: .WORD   INDOFF+RMNBAS   ;426 - Pointer to IND device name word
000470  001102              MEMPTR: .WORD   HNMEPT-MONVEC   ;430 - Offset to memory control blocks
000472  001132'             P1EXT:  .WORD   P1XPTR          ;432 - Kernel PAR1 routine
000474  000000              RPRCSR: .WORD   0               ;434 - Get CSR address of PRO devices
000476  000000              RPRVEC: .WORD   0               ;436 - Get vector address of PRO devices
000500  000000              DWTYPE: .WORD   0               ;440 - Type of DW disk
                            ;  Dummy cell corresponding to cell in RT-11 with TT option flags.
        000442              TTOPTS  =       .-MONVEC        ;Offset to TTOPTS cell
000502  000000              TTOP:   .WORD   0               ;TTOPTS cell
                            ;  Cell with name of IND RUN device
        000444              INDOFF  =       .-MONVEC        ;Offset to INDDEV cell
000504     123     131     060 INDDEV: .ASCII  /SY0:/       ;Default device from which IND is run
```

```
000507     072
                                    ;-----------------------------------------------------------------------
                                    ;   MFPS is called to return on the stack the contents of the low-order
                                    ;   byte of the processor status word.
                                    ;   Note: This only works when used within handlers. If a .MFPS macro
                                    ;         is used in a TSX-Plus user job, a value of zero is returned.
                                    ;
                                    ;   Outputs:
                                    ;    Processor status word is on top of stack.
                                    ;
000510  005046                      MFPS:   CLR     -(SP)
000512  013716  000000G             MFPMOV: MOV     @#PSW,(SP)      ;Get the psw (** patched during job init **)
000516  016646  000002                      MOV     2(SP),-(SP)     ;Now push return address on top
000522  016666  000002  000004              MOV     2(SP),4(SP)     ;Move down PS value
000530  012616                              MOV     (SP)+,(SP)      ;Move down return address
000532  000207                              RETURN
                                    ;
                                    ;   MTPS is called to set the value of the low-order byte of the
                                    ;   processor status word.
                                    ;
                                    ;   Inputs:
                                    ;    Value to be moved to psw is on top of stack before call.
                                    ;
                                    ;   Outputs:
                                    ;    Value is moved to psw and popped from the stack.
                                    ;
000534  000006                      MTPS:   RTT                     ;PC&PS are on stack, let RTT set PS and return
                                    ;
                                    ;-----------------------------------------------------------------------
                                    ;   Device and handler information tables (Do not change the order).
                                    ;
                                    ;   *** VM depends on PHYMEM being 1 word below PNAME ***
                                    ;
000536  000000                      PHYMEM: .WORD   0               ;*** Store actual physical memory size ***
000540  000010                      PNAME:  .REPT   MAXDEV          ;Table of permanent device names (Rad50)
                                            .WORD   0
                                            .ENDR
000560  000010                      HANENT: .REPT   MAXDEV          ;Handler entry point
                                            .WORD   0
                                            .ENDR
000600  177777                              .WORD   -1              ;Flag to mark end of HANENT table
000602  000010                      DVSTAT: .REPT   MAXDEV          ;Device status flags
                                            .WORD   0
                                            .ENDR
000622  000010                      HANDSK: .REPT   MAXDEV          ;Location of handler on the disk
                                            .WORD   0
                                            .ENDR
000642  000010                      HANSIZ: .REPT   MAXDEV          ;Size of device handler
                                            .WORD   0
                                            .ENDR
000662  000010                      DEVSIZ: .REPT   MAXDEV          ;# 256-word blocks on device
                                            .WORD   0
                                            .ENDR
000702  000010                      HANPAR: .REPT   MAXDEV          ;64-byte base block for handler if mapped
                                            .WORD   0
                                            .ENDR
000722  000010                      HANIOC: .REPT   MAXDEV          ;# uncompleted I/O requests for handler
```

```
                                        .WORD   0
                                        .ENDR
000742  000010                  DVFLAG: .REPT   MAXDEV          ;Table of device characteristics
                                        .WORD   0
                                        .ENDR
        000722                  MAXGVL  =       .-MONVEC        ;Max offset allowed with .GVAL
                                ;-----------------------------------------------------------------------
                                ;
                                ;  Reserve space for extended channel space
                                ;
000762                          EXTCHN:
        000010                          .REPT   <NLCHN-17.>
                                        CHNRES
                                        .ENDR
                                ;
                                ;  Reserve space for channel used to access INDTMP file
                                ;
001102                          INDTSV: CHNRES                  ;Channel used for I/O to INDTMP file
                                ;
                                ;  Address of channel block for swap file access
                                ;
        001070'                 SWPCHN  =       EXTCHN+<10.*<USWPCH-17.>>
                                ;
                                ;  End of MONVEC pointer table area.
                                ;
        001056                  MVSIZ   =       .-VECBAS
        000427                  MVWDS   =       MVSIZ/2         ;# words in mon vector table
                                ;
                                ;  Define offsets into monitor vector area
                                ;
        000006                  R$CHN   =       SYSCHN-VECBAS   ;Start of channel space
        000234                  R$CH17  =       SYCH17-VECBAS   ;Offset to channel # 17
        000724                  R$XCHN  =       EXTCHN-VECBAS   ;Offset to extended channel space
        000264                  R$DATE  =       SYSDAT-VECBAS   ;Offset to date word
        000324                  R$JOB   =       CORUSR-VECBAS   ;Offset to job number cell
        000270                  R$UBAS  =       USROFF-VECBAS   ;Offset to usr base address cell
        000444                  R$TTOP  =       TTOP-VECBAS     ;Offset to TT option word
        000421                  R$INST  =       INSTA-VECBAS    ;Offset to IND status byte
        000370                  R$CFST  =       CFSTS-VECBAS    ;Offset to command file status word
        001044                  R$INTC  =       INDTSV-VECBAS   ;Offset to INDTMP channel block
        001032                  R$SWPC  =       SWPCHN-VECBAS   ;Offset to USWPCH channel block
        000454                  R$MFMV  =       MFPMOV-VECBAS   ;Offset to MFPMOV instruction
                                ;
                                ;-------------------------------------------------------------------
                                ;  Vector of entry points to handler support routines
                                ;  (Do not alter the order)
                                ;
001114  000167  000000G                 JMP     CVTPHY          ;Routine to convert virtual to physical addr
001120  000167  000000G                 JMP     FNDHRB          ;Routine to search for RCB for handler
001124  000167  000000G                 JMP     HANXMR          ;Routine to allocate XM region for handler
001130  000402                          BR      BMJMP           ;Routine to do block move
001132  000167  000000G         P1XPTR: JMP     EXTP1           ;Routine to execute mapped code
001136  000167  000000G         BMJMP:  JMP     BLKMV
                                ;
                                ;-----------------------------------------------------------------------
                                ;  Memory allocation information for handlers
                                ;
```

```
    228 001142  000000                      HNMEPT: .WORD   0
    229 001144  000000                              .WORD   0
    230 001146  000000                      HANRCO: .WORD   0
```

```
                                ;-----------------------------------------------------------------------
                                ;  Misc data cells
                                ;
001150  000002                  VQUAN0:  .WORD   QUAN0
001152  000024                  VQUAN1:  .WORD   QUAN1
001154  000002                  VQUN1A:  .WORD   QUAN1A
001156  000002                  VQUN1B:  .WORD   QUAN1B
001160  000001                  VQUN1C:  .WORD   QUAN1C
001162  000012                  VQUAN2:  .WORD   QUAN2
001164  000024                  VQUAN3:  .WORD   QUAN3
001166  000002                  VCORTM:  .WORD   CORTIM
001170  000050                  VHIPCT:  .WORD   HIPRCT
001172  000036                  VINTIO:  .WORD   INTIOC
001174  000062                  VMXSF:   .WORD   MAXSF
001176  000144                  VMXSFC:  .WORD   MAXSFC
001200  000000                  VNUMDC:  .WORD   NUMDC
001202  000003                  VMLBLK:  .WORD   MXLBLK
001204  000024                  VUCLMC:  .WORD   UCLMNC
001206  001750                  VMXFIL:  .WORD   MAXFIL
001210  000074                  VNFCSH:  .WORD   NMFCSH
001212  000005                  VMXMON:  .WORD   MAXMON
001214  000170                  VTMOUT:  .WORD   TIMOUT
001216  000074                  VOFFTM:  .WORD   OFFTIM
001220  000005                  VMAXMC:  .WORD   MAXMC
001222  000310                  VMSCHR:  .WORD   MSCHRS
001224  000006                  VMXMSG:  .WORD   MAXMSG
001226  000005                  VMXMRB:  .WORD   MAXMRB
001230  000100                  VHIMEM:  .WORD   HIMEM
001232  000100                  VDFMEM:  .WORD   DFLMEM
001234  000012                  VSWPSL:  .WORD   SWPSLT                 ;# of job slots in swap file
001236  000764                  VPLAS:   .WORD   SEGBLK                 ;# blocks for PLAS swap file
001240  000014                  VNGR:    .WORD   NGR                    ;Number of global PLAS regions
001242  000004                  NDVRCB:  .WORD   DEVXMR                 ;Number of PLAS regions for device handlers
001244  000012                  VMXWIN:  .WORD   MAXWIN                 ;Maximum number of display windows
001246  000007                  VKEYMX:  .WORD   KEYMAX                 ;Maximum # user-defined keys
001250  000004                  VNUIP:   .WORD   NUIP                   ;Number of user programs that may be INSTALLed
001252  000454                  VCSHNB:  .WORD   CACHE                  ;# blocks in use for generalized data cache
001254  000454                  CSHALC:  .WORD   CACHE                  ;# blocks allocated for generalized data cache
001256  040150                  VNRFLG:  .WORD   NRMFLG                 ;Default time-sharing line flags
001260  000000G                 VSCHED:  .WORD   SCHED                  ;An entry point in TSEXEC
001262  000000G                 VDSKBU:  .WORD   DSKBUF                 ;A global from TSINIT
001264  000062                  VNCSLO:  .WORD   NCSILO                 ;Default #bytes for TT and CL silos
001266     014                  VNCXOF:  .BYTE   NCXOFF                 ;Default XOFF when only this many free
001267     004                  VNCXON:  .BYTE   NCXON                  ;Default XON when this many remain
001270  000276                  VDISPC:  .WORD   DINSPC                 ;Default line input buffer size
001272  000360                  VDOSPC:  .WORD   DOTSPC                 ;Default line output buffer size
001274  000000                  SYTIMH:  .WORD   0                      ;High-order system time word
001276  000000                  SYTIML:  .WORD   0                      ;Low-order system time word
001300  000000                  TK1SEC:  .WORD   0                      ;# clock ticks per second
001302  000000                  TK1VAL:  .WORD   0                      ;# clock ticks per 0.1 second
001304  000000                  TK1CNT:  .WORD   0
001306  000000                  TK5VAL:  .WORD   0                      ;# clock ticks per 0.5 seconds
001310  000000                  TK3SVL:  .WORD   0                      ;# clock ticsk per 3 seconds
001312  000000                  TSXSIT:  .WORD   0
001314  000000                  FRKDLY:  .WORD   0                      ;Max clock ticks a fork request was delayed
001316  000000                  CTRLTT:  .WORD   0                      ;# of operator's console
001320  000000                  MINTIM:  .WORD   0                      ;Number of minutes of system up-time
```

```
    58 001322                          SEGCHN: .BLKW   5                   ;Channel block used for PLAS region swapping
    59 001334 000000                   KMNTOP: .WORD   0                   ;Abs address of top of TSKMON
    60 001336 000000                   KMNHI:  .WORD   0                   ;KMNTOP-KMNBAS
    61 001340                          CCLSAV: .BLKW   5                   ;Savestatus for CCL.SAV file info
    62 001352                          INDSAV: .BLKW   5                   ;Savestatus for IND.SAV file info
    63 001364 000000                   INDDBL: .WORD   0                   ;Lowest block in IND.SAV file of data segmemt
    64 001366 000000                   INDDBS: .WORD   0                   ;Number of blocks in IND.SAV data segment
    65 001370 000000                   USRBAS: .WORD   0                   ;Phys 64-byte block # of TSUSR overlay
    66 001372 000000                   MSGBAS: .WORD   0                   ;Phys 64-byte block # of TSMSG overlay
    67 001374 000000                   WINBAS: .WORD   0                   ;Phys 64-byte block # of TSWIN overlay
    68 001376 000000                   LOKBAS: .WORD   0                   ;Phys 64-byte block # of TSLOCK overlay
    69 001400 000000                   CSHBAS: .WORD   0                   ;Phys address of TSCASH code
    70 001402 000000                   TIOBAS: .WORD   0                   ;Phys address of TSTIOX code
    71 001404 000000                   LOKMEM: .WORD   0                   ;Phys 64-byte block # of rec locking data area
    72 001406 000000                   LOKCSH: .WORD   0                   ;Phys 64-byte block # of shared file cache buf
    73 001410 000000                   NUMDCD: .WORD   NUMDC               ;Num of shared file data cache entries
    74 001412 000144                   NUMCDB: .WORD   MAXSFC              ;Number of free shared file channels
    75 001414 000000                   SNMSHD: .WORD   0                   ;Head of free list of system message buffers
    76 001416 000002                   NMUMB:  .WORD   <NMSNMB-NMSYMB>     ;# message buffers available for user access
    77 001420 000000                   CSHHD:  .WORD   0                   ;Head of directory cache list
    78 001422 000000                   MONFQH: .WORD   0                   ;Head of free list of monitor control blocks
    79 001424 000000                   MIOBHD: .WORD   0                   ;Head of mapped I/O control block list
    80 001426 000000                   MIOWHD: .WORD   0                   ;Head of mapped I/O wait block list
    81 001430 000000                   MIOSYQ: .WORD   0                   ;Pointer to 1st active mapped I/O wait block
    82 001432 000000                   SMONHD: .WORD   0                   ;Head of job monitoring requests for all jobs
    83 001434 000000                   SFCB:   .WORD   0                   ;Start of spool file control block area
    84 001436 000000                   SFCBND: .WORD   0                   ;End of spool file control block area
    85 001440 000000                   SFCBFH: .WORD   0                   ;Head of free spool file control block list
    86 001442 000036                   NSPLFL: .WORD   SPLNF               ;Number of spool files
    87 001444 000372                   NSPLBL: .WORD   SNDBX               ;Number of blocks in spool file
    88 001446 000000                   NFRESB: .WORD   0                   ;Number of public spool file blocks
    89 001450 000000                   SHRRCB: .WORD   0                   ;Pointer to base of global RCB area
    90 001452 000000                   SHRRCN: .WORD   0                   ;Pointer to end of global RCB area
    91 001454 000000                   INSTBL: .WORD   0                   ;Pointer to base of INSTALL table
    92 001456 000000                   INSTBN: .WORD   0                   ;Pointer past end of INSTALL table
    93 001460 000000                   ABRTOV: .WORD   0                   ;Rad50 name of overlay during trap
    94 001462 000036                   VMXCSH: .WORD   MAXCSH              ;Max number of cached devices
    95 001464 000000                   CSHDEV: .WORD   0                   ;Start of area with device cache blocks
    96 001466 000000                   CSHDVN: .WORD   0                   ;End of area with device cache blocks
    97 001470 000000                   SCPFHD: .WORD   0                   ;Head of free list of swap command packets
    98 001472 177777                   LDDEVX: .WORD   -1                  ;Device index number of "LD" device
    99 001474 177777                   CLDEVX: .WORD   -1                  ;Device index number of "CL" device
   100 001476 177777                   C1DEVX: .WORD   -1                  ;Device index number of "C1" device
   101 001500 000000 000000 000000     BOTDEV: .WORD   0,0,0,0             ;Device spec for device being booted from
       001506 000000
   102 001510 000000                   BOTUNI: .WORD   0                   ;Unit # of device being booted from
   103 001512 000000                   BOTCSR: .WORD   0                   ;CSR of device being booted from
   104 001514 000000                   SPOLID: .WORD   0                   ;Last spool file ID number
   105 001516 000000                   UMSYTP: .WORD   0                   ;Address of top of unmapped system space
   106 001520 000001                   IOABFL: .WORD   IOABT               ;1==>Do I/O abort, 0==>Do I/O wait
   107 001522 000000G                  DEFBAS: .WORD   TSDEFS
   108 001524 114716                   SYNAME: .RAD50  /XXN/               ;Actual name of SY physical device
   109 001526 075250 100020 101704     UCLNAM: .RAD50  /SY TSXUCLSAV/      ;Name of TSXUCL program
       001534 073376
   110 001536 000000                   UCLBLK: .WORD   0                   ;# blocks in TSXUCL data file for each job
   111 001540 075250 102405 057760     UKMNAM: .RAD50  /SY UKMON SAV/      ;Name of user-provided TSKMON command processr
       001546 073376
```

```
001550  000000                  PIDPTR: .WORD   0               ;Pointer to clock-driven PI handler routine
001552                          PROSLT: .BLKW   9.              ;ID # of device in each PRO option slot
001574  000000                  VIDCSR: .WORD   0               ;Address of PRO video CSR
001576  177564                  VDMTCR: .WORD   DMPTCR          ;Transmitter control reg addr for dump device
001600  000000                  MODDAT: .WORD   0               ;Date last modified by TSXMOD
001602  000000                  MODTIM: .WORD   0               ;Time (3-sec) last modified by TSXMOD
001604  000000                  HANRCB: .WORD   0               ;Pointer to start of handler RCB area
                                ;
                                ;  Data for generalized data cache
                                ;
001606  000000                  CA$BLK: .WORD   0               ;Block number associated with cache entry
001610  000000                  CA$DVU: .WORD   0               ;Device and unit # associated with entry
001612  000000                  CA$WCT: .WORD   0               ;Number of words in entry
001614  000000                  CA$UFL: .WORD   0               ;LRU chain forward link
001616  000000                  CA$UBL: .WORD   0               ;LRU chain backward link
001620  000000                  CA$HFL: .WORD   0               ;Hash chain forward link
001622  000000                  CA$HBL: .WORD   0               ;Hash chain backward link
001624  000000                  CA$HSH: .WORD   0               ;Hash chains list head vector
001626  000000                  CSHBFP: .WORD   0               ;64-byte block number of buffer area
001630  000000                  CSHLRU: .WORD   0               ;Pointer to least-recently-used entry
001632  000000                  CSHMRU: .WORD   0               ;Pointer to most-recently-used entry
001634  000000                  CSHFHD: .WORD   0               ;Head of cache block free list
001636  000000                  CCBHD:  .WORD   0               ;Head of cache control block free list
001640  000000  000000          CASTRO: .WORD   0,0             ;Total # reads from mounted devices
001644  000000  000000          CASTBR: .WORD   0,0             ;Total # blocks read from mounted devices
001650  000000  000000          CASCBR: .WORD   0,0             ;Number of blocks that were read from cache
001654  000000  000000          CASTWO: .WORD   0,0             ;Total # writes to mounted devices
001660  000000  000000          CASTBW: .WORD   0,0             ;Total # blocks written to mounted devices
001664  000000  000000          CASCUP: .WORD   0,0             ;Number of blocks moved into data cache
                                ;  Entry point vector for caching module
001670                          CSHVEC:
001670  000000                  CSHINI: .WORD   0               ;-
001672  000000                  CSHIO:  .WORD   0               ;-
001674  000000                  CSHCLN: .WORD   0               ;-
001676  000000                  CSHFIN: .WORD   0               ;-
001700  177777                          .WORD   -1              ;- End of pointer vector
                                ;
                                ;  Entry point vector for record locking module
                                ;
001702                          LOKVEC:
001702  000000                  LOKINI: .WORD   0               ;-
001704  000000                  DOOPAP: .WORD   0               ;-
001706  000000                  DOCOPN: .WORD   0               ;-
001710  000000                  SFSVST: .WORD   0               ;-
001712  000000                  SFRSST: .WORD   0               ;-
001714  000000                  DORLK:  .WORD   0               ;-
001716  000000                  DOTLK:  .WORD   0               ;-
001720  000000                  DOCULK: .WORD   0               ;-
001722  000000                  DOULK1: .WORD   0               ;-
001724  000000                  DOSFCK: .WORD   0               ;-
001726  000000                  SFCLS:  .WORD   0               ;-
001730  000000                  SFWRIT: .WORD   0               ;-
001732  000000                  CLSCDB: .WORD   0               ;-
001734  000000                  DCRD1:  .WORD   0               ;-
001736  000000                  DCRD2:  .WORD   0               ;-
001740  177777                          .WORD   -1              ;- End of pointer vector
                                ;
```

```
    169                                         ;  Misc byte data
    170                                         ;
    171 001742     000                          VSYDMP: .BYTE   SYSDMP          ;Generate dump on crash if non-zero
    172 001743     000                          VDMKTP: .BYTE   DMPKTP          ;Crash on any kernel trap if non-zero
    173 001744     001                          VSWPFL: .BYTE   SWAPFL
    174 001745     001                          VBUSTP: .BYTE   BUSTYP
    175 001746     000                          VINABT: .BYTE   INIABT
    176 001747     000                          VUXIFL: .BYTE   UXIFLG
    177 001750     001                          VU$CL:  .BYTE   U$CL
    178 001751     002                          VUCLOR: .BYTE   UCLORD
    179 001752     001                          VLDSYS: .BYTE   LDSYS
    180 001753     001                          VSLEDT: .BYTE   SLEDIT
    181 001754     000                          VDBFLG: .BYTE   DBGFLG
    182 001755     023                          VPRILO: .BYTE   PRILOW
    183 001756     120                          VPRIHI: .BYTE   PRIHI
    184 001757     062                          VPRIDF: .BYTE   PRIDEF
    185 001760     012                          VPRIVR: .BYTE   PRIVIR
    186 001761     035                          VTSLCH: .BYTE   TSLICH
    187 001762     027                          VVLSCH: .BYTE   VLSWCH
    188 001763     002                          VVPWCH: .BYTE   PWCH
    189 001764     034                          VCXTRM: .BYTE   CCXTRM
    190 001765     001                          VCXCTL: .BYTE   CCXCTL
    191 001766     003                          VEDIT:  .BYTE   EDITOR
    192 001767     000                          VMIOBF: .BYTE   MIONBF
    193 001770     017                          VMIOSZ: .BYTE   MIOBSZ
    194 001771     000                          VUSPHN: .BYTE   PHONE           ;0=local if no DCD;1=always mon DCD if $phone
    195 001772     000                          MAPUSR: .BYTE   0               ;Number of job memory mapping is set up for
    196 001773     000                          LINNUM: .BYTE   0
    197 001774     000                          MUXNUM: .BYTE   0
    198 001775     000                          NUMON:  .BYTE   0
    199 001776     000                          PVON:   .BYTE   0
    200 001777     000                          TOTON:  .BYTE   0
    201 002000     000                          PROFLG: .BYTE   0               ;Non-zero ==> Running on PRO-350
    202 002001     000                          STPFLG: .BYTE   0
    203 002002     000                          UBUSMP: .BYTE   0               ;1==>Do Unibus mapping
    204 002003     000                          SR3FLG: .BYTE   0               ;NON-ZERO==>MEMORY MANAGEMENT REG 3 PRESENT
    205 002004     000                          MEM256: .BYTE   0               ;Non-zero==>machine has at least 256kb
    206 002005     000                          MIOFLG: .BYTE   0               ;Non-zero==>I/O mapping needed for some device
    207 002006     000                          NSPLDV: .BYTE   0               ;Number of installed spooled devices
    208 002007     000                          CLVERS: .BYTE   CLVRSN          ;CL handler version number
    209 002010     000                          LDVERS: .BYTE   0               ;LD translation table format (1<RTV5.4=<2)
    210 002011     041     200                  SYPSPR: .ASCII  /!/<200>        ;Prompt for system password
    211                                                 .EVEN
    212                                         ;  System time counters
    213 002014  000000                          TMTOTH: .WORD   0               ;Total uptime (0.1 second units)
    214 002016  000000                          TMTOTL: .WORD   0
    215 002020  000000                          TMUSRH: .WORD   0               ;Time spent in user jobs
    216 002022  000000                          TMUSRL: .WORD   0
    217 002024  000000                          TMSWTH: .WORD   0               ;Swap-wait time
    218 002026  000000                          TMSWTL: .WORD   0
    219 002030  000000                          TMIOH:  .WORD   0               ;Time user i/o is active
    220 002032  000000                          TMIOL:  .WORD   0
    221 002034  000000                          TMSWPH: .WORD   0               ;Time swapping is active
    222 002036  000000                          TMSWPL: .WORD   0
    223 002040  000000                          TMIOWH: .WORD   0               ;Time system is doing i/o-wait
    224 002042  000000                          TMIOWL: .WORD   0
    225 002044  000000                          TMIDLH: .WORD   0               ;Idle time
    226 002046  000000              TMIDLL: .WORD   0
    227                             ;
    228                             ;  Shared file data cache statistics counters
    229                             ;
    230 002050  000000              DCTOTU: .WORD   0               ;Total number of cache hits since last divisn
    231 002052  000000              DCTRD:  .WORD   0               ;Total number of reads from shared files
    232 002054  000000              DCCRD:  .WORD   0               ;Number of reads satisfied by data in cache
    233 002056  000000              DCTWR:  .WORD   0               ;Total number of writes to shared files
    234 002060  000000              DCCWR:  .WORD   0               ;Number of writes that update cache
    235                             ;
    236 002062  000000              NUMDEV: .WORD   0               ;Byte index to last entry in device tables
    237 002064  000000              FREIOQ: .WORD   0               ;Head of i/o queue element chain
    238                             ;
    239                             ;  Define mux tables for DZ11's and DH11's.
    240                             ;
    241                                     .MACRO  MXTBL   NAME
    242                                     .NLIST
    243                             NAME    =       .-2
    244                                     .GLOBL  NAME
    245                                     .REPT   MAXMUX
    246                                     .WORD   0
    247                                     .ENDR
    248                                     .LIST
    249                                     .ENDM   MXTBL
    250                             ;
    251 002066                              MXTBL   MXTYPE          ;DZ11 & DH11 type of mux (CDX$DZ or CDX$DH)
    252 002070                              MXTBL   MXCSR           ;DZ11 Control Status Register
    253 002072                              MXTBL   MXLPR           ;DZ11 Line Parameter Register
    254 002074                              MXTBL   MXTCR           ;DZ11 Transmit Control Register
    255 002076                              MXTBL   MXDTR           ;DZ11 Data Terminal Ready
    256 002100                              MXTBL   MXTBUF          ;DZ11 Transmitter Buffer Register
    257 002102                              MXTBL   MXSBRK          ;DZ11 Shadow register for hardware BRK reg.
    258 002104                              MXTBL   MXCAR           ;DZ11 Carrier Detect
    259 002106                              MXTBL   MXVEC           ;DZ11 & DH11 Vector address
    260 002110                              MXTBL   MXLNT           ;DZ11 & DH11 Addr of table to map mux # to Lin
    261 002112                              MXTBL   MH$BRK          ;DH11 Break control register
    262 002114                              MXTBL   MH$LPR          ;DH11 Line Parameter Register
    263 002116                              MXTBL   MH$PBR          ;DH11 Previous value of BAR register
    264 002120                              MXTBL   DM$CSR          ;DH11(DM11) Control Status Register
    265 002122                              MXTBL   DM$LSR          ;DH11(DM11) Line Status Register
    266 002124                              MXTBL   DM$VEC          ;DH11(DM11) Address of DM11 interrupt vector
    267         002070'             MXRBUF  =       MXLPR           ;DZ11 Receiver Buffer Register
    268         002076'             MXRING  =       MXTBUF          ;DZ11 Ring indicator flags
    269         002102'             MXBRK   =       MXCAR           ;DZ11 Break control flags
    270                             ;  Equates for DH11 control registers
    271         002066'             MH$SCR  =       MXCSR           ;DH11 System Control Register
    272         002070'             MH$RCR  =       MXRBUF          ;DH11 Received Character Register
    273         002072'             MH$CAR  =       MXTCR           ;DH11 Current Address Register
    274         002074'             MH$BCR  =       MXDTR           ;DH11 Byte Count Register
    275         002076'             MH$BAR  =       MXTBUF          ;DH11 Buffer Active Register
    276         002102'             MH$SSR  =       MXCAR           ;DH11 Silo Status Register
    277                             ;  Equates for DHV11 control registers
    278         002066'             VH$CSR  =       MH$SCR          ;DHV11 Control and Status Register
    279         002070'             VH$DBR  =       MH$RCR          ;DHV11 Data Buffer Register
    280         002112'             VH$LPR  =       MH$LPR          ;DHV11 Line Parameter Register
    281         002120'             VH$LSR  =       DM$LSR          ;DHV11 Line Status Register
    282         002116'             VH$LCR  =       DM$CSR          ;DHV11 Line Control Register
    283          002072'                   VH$BA1  =       MH$CAR          ;DHV11 Buffer Address register 1
    284          002102'                   VH$BA2  =       MH$SSR          ;DHV11 Buffer Address register 2
    285          002074'                   VH$BCR  =       MH$BCR          ;DHV11 Byte Count Register
    286                                    ;
    287                                    ;  Generate FORK request blocks.
    288                                    ;
    289 002126   002132'                   FREFRK: .WORD   FRKLST          ;Head of free list
    290 002130   000000                    FRKINI: .WORD   0               ;Pointer to fork blocks in init area
    291 002132                             FRKLST:
    292          000004                            .REPT   FRKGEN          ;Gen in a few static fork blocks
    293                                            .WORD   .+22.           ;Link to next block in free list
    294                                            .WORD   0,0,0,0,0,0,0,0,0
    295                                            .ENDR
    296 002262   000000  000000  000000            .WORD   0,0,0,0,0,0,0,0,0,0,0 ;Last block with 0 forward link
        002270   000000  000000  000000
        002276   000000  000000  000000
        002304   000000  000000
    297                                    ;
    298                                    ;  Symbolic equates for QBUS and UNIBUS machines.
    299                                    ;
    300          000001                    QBUS    =       1
    301          000000                    UNIBUS  =       0
    302                                    ;
    303                                    ;  Generate the memory size limit checking certain restrictions.
    304                                    ;  On non-extended machines, allow 256.Kb - 8.Kb I/O page
    305                                    ;  On extended machines, allow 4096.Kb - 256.Kb I/O page
    306                                    ;
    307                                            .MACRO  MEMORY  SIZE
    308                                            SIZMEM  = SIZE
    309                                            .IF     LE, SIZMEM
    310                                                    SIZMEM = 3840.
    311                                            .ENDC
    312                                            .IF     GT, SIZMEM-3840.
    313                                                    SIZMEM = 3840.
    314                                            .ENDC
    315                                            .IF     LT, <SIZMEM - 96.>
    316                                    .ERROR  ;Memory size limit too small for running TSX-Plus
    317                                            .ENDC
    318                                    ;  Allocate the memory size to examine.
    319                                            .WORD   SIZMEM*20
    320                                            .ENDM   MEMORY
    321                                    ;
    322                                    ;  Memory management tables
    323                                    ;
    324 002310                             MAPSIZ: MEMORY  MEMSIZ          ;PAR value of physical memory cutoff
    325 002312   000000                    BASMAP: .WORD   0               ;Pointer to base of memory map table
    326 002314   000000                    LOMAP:  .WORD   0               ;Pointer to 1st user page in MEMMAP
    327 002316   000000                    HIMAP:  .WORD   0               ;Pointer above top user page in memmap
    328 002320   000000                    MAPPAR: .WORD   0               ;Value to map PAR 5 to mem allocation table
    329 002322   000000                    FREPGS: .WORD   0               ;# free pages
    330 002324   000000                    JCXPGS: .WORD   0               ;# pages needed for job context block
    331 002326   000000                    MXJMEM: .WORD   0               ;Max # K-bytes a job may use
    332 002330   000000                    DFJMEM: .WORD   0               ;Default # K-bytes a job may use
    333 002332   000000                    MXJADR: .WORD   0               ;Address above top of largest job space
    334 002334   000000                    SMRSIZ: .WORD   0               ;# 64-byte blocks allocated to system overlays
    335 002336   000000                    MHNSIZ: .WORD   0               ;# 64-byte blocks allocated for mapped handler
    336 002340   000000                    SRTSIZ: .WORD   0               ;# 64-byte blocks allocated for shared run-tim
    337 002342  000000                  CSHSIZ: .WORD   0               ;# 64-byte blocks allocated for data cache
    338                                 ;
    339                                 ;  Start a CSECT to hold shared run-time descriptor blocks
    340                                 ;
    341 000000                                  .CSECT  RDBSEC          ;CSECT for RDB entries
    342 000000                          RDBSEC:
    343 000000                          RDB:                            ;Define base of RDB entries
    344 002344                                  .CSECT  TSGEN           ;Go back to standard TSGEN CSECT
    345                                 ;
    346                                 ;  Symbolic equates for system editor names.
    347                                 ;  Note these equates must match those in TSDEFS.
    348                                 ;
    349         000001                  EDIT    =       1
    350         000002                  TECO    =       2
    351         000003                  KED     =       3
    352         000004                  K52     =       4
    353                                 ;
    354                                 ;  Symbolic equates for UCL order
    355                                 ;
    356         000001                  FIRST   =       1
    357         000002                  MIDDLE  =       2
    358         000003                  LAST    =       3
    359                                 ;
    360                                 ;  Symbolic names used to define line transmit/receive speeds.
    361                                 ;
    362         000000                  S50     =       0               ;50    baud
    363         000001                  S75     =       1               ;75    baud
    364         000002                  S110    =       2               ;110   baud
    365         000003                  S134.5  =       3               ;134.5 baud
    366         000004                  S150    =       4               ;150   baud
    367         000005                  S300    =       5               ;300   baud
    368         000006                  S600    =       6               ;600   baud
    369         000007                  S1200   =       7               ;1200  baud
    370         000010                  S1800   =       10              ;1800  baud
    371         000011                  S2000   =       11              ;2000  baud
    372         000012                  S2400   =       12              ;2400  baud
    373         000013                  S3600   =       13              ;3600  baud
    374         000014                  S4800   =       14              ;4800  baud
    375         000015                  S7200   =       15              ;7200  baud
    376         000016                  S9600   =       16              ;9600  baud
    377         000017                  S19200  =       17              ;19200 baud
    378                                 ;
    379                                 ;  Symbolic names for parity codes
    380                                 ;
    381         040000                  EVEN    =       040000          ;Even parity
    382         140000                  ODD     =       140000          ;Odd parity
    383         000000                  NONE    =       000000          ;No parity
```

```
                        ;----------------------------------------------------------
                        ;  The following macro define the device handler tables.
                        ;  There are two psects use in the device definition - one
                        ;  allocates and defines the rad50 device name - the second
                        ;  defines the handler attributes.
                        ;
                                .MACRO  DEVBEG          ;DEFINE THE DEVICE GLOBAL ENTRIES
                                .CSECT  DNAME           ;DEFINE THE DEVICE NAME PSECT
                        AUTHAN:                         ;GLOBAL LABEL FOR DEVICE NAMES
                                .CSECT  DTYPE           ;DEFINE THE DEVICE TYPE PSECT
                        DTYPE:
                                .CSECT  TSGEN
                                .ENDM   DEVBEG

                        ;----------------------------------------------------------------------------
                        ;  The following flag definitions must match the TSDEFS definitions.
                        ;

000001                  DMA     =       1       ;DX$DMA - This is a DMA device
000002                  MAPIO   =       2       ;DX$MAP - 18-bit controller -- may require mapped I/O
000004                  EVNBUF  =       4       ;DX$EBA - Buffer must be on even byte boundary
000010                  NOCACHE =       10      ;DX$NCA - Do not do caching for this device
000020                  NOMOUNT =       20      ;DX$NMT - Do not allow mounts for this device
000040                  REQALC  =       40      ;DX$RAL - Require device to be allocated before use
000100                  MAPH    =       100     ;DX$MPH - Map the handler for this device
000200                  NOMAPH  =       200     ;DX$NHM - Do not map the handler for this device
000400                  HANBUF  =       400     ;DX$IBH - Handler contains internal I/O buffer
001000                  HNSPDO  =       1000    ;DX$NRD - Do .SPFUN to tell handler about dir ops
002000                  NOSET   =       2000    ;DX$NST - Do not reload handler after SET

000000                  NODMA   =       0               ;This is not a DMA device
000000                  NONDMA  =       NODMA

                        ;----------------------------------------------------------------------------
                        ;  The DEVDEF macro defines the device name and allocates
                        ;  table entries for the device name and the device attributes.
                        ;
000001                  DVNUM = 1

                                .MACRO  DEVDEF  DEVNAM,DFLG1,DFLG2,DFLG3,DFLG4,DFLG5,DFLG6,DFLG7,DFLG8,DFLG9

                        DVNUM = DVNUM + 1               ;Increment the device number
                        DVFLG   =       0               ;Get device flags in DVFLG

                                .IF     LT, <MAXDEV-2 - DVNUM>  ;Check the maximum devices allowed
                        .ERROR  1;More devices defined than MAXDEV
                                .MEXIT
                                .ENDC

                        ;  Accumulate flags for the device definition

                                .IF     NB DFLG1        ;Check if argument exists
                        DVFLG = DVFLG!DFLG1             ;Include in device attributes
                                .ENDC ;NB DFLG1

                                .IF     NB DFLG2        ;Check if argument exists
                        DVFLG = DVFLG!DFLG2             ;Include in device attributes
```

```
        .ENDC ;NB DFLG2

        .IF     NB DFLG3                ;Check if argument exists
DVFLG = DVFLG!DFLG3                     ;Include in device attributes
        .ENDC ;NB DFLG3

        .IF     NB DFLG4                ;Check if argument exists
DVFLG = DVFLG!DFLG4                     ;Include in device attributes
        .ENDC ;NB DFLG4

        .IF     NB DFLG5                ;Check if argument exists
DVFLG = DVFLG!DFLG5                     ;Include in device attributes
        .ENDC ;NB DFLG5

        .IF     NB DFLG6                ;Check if argument exists
DVFLG = DVFLG!DFLG6                     ;Include in device attributes
        .ENDC ;NB DFLG6

        .IF     NB DFLG7                ;Check if argument exists
DVFLG = DVFLG!DFLG7                     ;Include in device attributes
        .ENDC ;NB DFLG7

        .IF     NB DFLG8                ;Check if argument exists
DVFLG = DVFLG!DFLG8                     ;Include in device attributes
        .ENDC ;NB DFLG8

        .IF     NB DFLG9                ;Check if argument exists
DVFLG = DVFLG!DFLG9                     ;Include in device attributes
        .ENDC ;NB DFLG9

;   Enter the device name into the table defining handlers to load on startup

        .CSECT  DNAME
        X = .
        .RAD50  /'DEVNAM'/              ;Include the device name in the PSECT
        .IF     NE, <.-X-2>
.ERROR  2;Incorrect device name specified
        .MEXIT
        .ENDC

;   Enter the device specification flag into handler flags table

        .CSECT  DTYPE
        .WORD   DVFLG                   ;Include the device type in the PSECT
        .CSECT  TSGEN

        .ENDM   DEVDEF

;-------------------------------------------------------------
;   The DEVEND macro allocates the remainder of the table entries.
;
        .MACRO  DEVEND
L       = <MAXDEV-2-DVNUM>
        .IF     GT,L
        .REPT   L
        DEVDEF  <$$ >
        .ENDR
```

```
                .ENDC   ;GT,L
                .CSECT  DNAME
        AHEND:
                .CSECT  TSGEN
                .ENDM   DEVEND
```

```
;-----------------------------------------------------------
;  The OB macro creates a table with NLINES entries
;  and defines the name of the table to be
;  1 word in front of the start of the table.
;  The name if globally defined.
;
        .MACRO  OB      NAME
        .NLIST
NAME    =       .-2
        .GLOBL  NAME
        .REPT   NLINES
        .WORD   0
        .ENDR
        .LIST
        .ENDM   OB

;-----------------------------------------------------
;  The OBP macro is similar to OB except it
;  generates only NPL (# of primary lines) entries
;  instead of NLINES entries.
;
        .MACRO  OBP     NAME
        .NLIST
NAME    =       .-2
        .GLOBL  NAME
        .REPT   NPL
        .WORD   0
        .ENDR
        .LIST
        .ENDM   OBP

;-----------------------------------------------------
;  The OBH macro is similar to OB except it
;  generates  TNHL (# lines requiring hardware control tables) entries
;  instead of NLINES entries.
;
        .MACRO  OBH     NAME
        .NLIST
NAME    =       .-2
        .GLOBL  NAME
        .REPT   TNHL
        .WORD   0
        .ENDR
        .LIST
        .ENDM   OBH

;-----------------------------------------------------
;  The OBT macro is similar to OB except it
;  generates  NPL+NSL+NDL+NIOL entries
;  instead of NLINES entries.
;
        .MACRO  OBT     NAME
        .NLIST
NAME    =       .-2
        .GLOBL  NAME
        .REPT   NPL+NSL+NDL+NIOL
        .WORD   0
        .ENDR
        .LIST
        .ENDM   OBT

;--------------------------------------------------------------------
;  The TBLDEF macro is called once to define table
;  space needed by all of the lines.
;  It has four arguments:
;  Argument 1 is the number of primary (real) lines.
;  Argument 2 is the number of subprocesses.
;  Argument 3 is the number of detached lines.
;  Argument 4 is the number of dedicated CL lines.
;
        .MACRO  TBLDEF  ANPL,ANSL,ANDL,ANIOL
        .NLIST  MD
NPL     =       ANPL            ;# of primary lines
NSL     =       ANSL            ;Number of subprocesses
NDL     =       ANDL            ;Number of detached lines
NIOL    =       ANIOL           ;Number of dedicated CL lines
NLINES  =       NPL+NSL+NDL     ;Total number of jobs
;
;  Make sure the total number of CL units does not exceed 16
;
        .IF     GT <NIOL-16.>
.ERROR ;You cannot have more than 16 CL units
NIOL    =       16.             ;Reduce number to 16.
        .ENDC
        .IF     GT <<NIOL+CLXTRA>-16.>
.ERROR ;You cannot have more than 16 CL units
CLXTRA  =       16.-NIOL                ;Reduce extra units if total > 16
        .ENDC
CLTOTL  =       NIOL+CLXTRA
;
;  Set up number of lines variables.
;  The lines are numbered in the following order:
;    Primary lines.
;    Detached job lines.
;    Subprocesses.
;    Dedicated CL lines.
;
LSTPL   =       2*NPL           ;Last primary line index
FSTDL   =       LSTPL+2         ;First detached line
LSTDL   =       LSTPL+<2*NDL>   ;Last detached line
FSTSL   =       LSTDL+2         ;Index to first subprocess
NLIN2   =       2*NLINES        ;Index to last time-sharing line
LSTSL   =       NLIN2           ;Index to last subprocess
FSTIOL  =       LSTSL+2         ;Index to first CL line
LSTIOL  =       FSTIOL+<2*<NIOL-1>> ;Index to last CL line
LSTLIN  =       2*<NPL+NSL+NDL+NIOL> ;Index number of last line
        .IF     EQ,NIOL         ;If there are no CL lines
TNHL    =       NPL             ;Total number of lines with hardware-ctrl tbls
        .IFF                    ;If there are CL lines
TNHL    =       NPL+NSL+NDL+NIOL;Total number of lines with hardware-ctrl tbls
        .ENDC
LSTHL   =       TNHL*2          ;Index # of last hardware line
;
;  Define number of slots in job swap file if SWPSLT=0
```

```
;
        .IF     EQ,SWPSLT
SWPSLT  =       NLINES          ;Default to one slot for each job
        .ENDC   ;EQ,SWPSLT
        .IF     GT,<SWPSLT-NLINES> ;Never need more slots than lines
SWPSLT  =       NLINES
        .ENDC   ;GT,<SWPSLT-NLINES>
        .IF     EQ,SWAPFL       ;If this is a non-swapping system
SWPSLT  =       0               ;No swap slots needed
        .ENDC   ;EQ,SWAPFL
;
;  Define line tables.
;
        OB      LQLINK          ;Link for execution queues
        OB      LSTATE          ;Current execution state
        OB      LBSPRI          ;Job base priority value (byte)
LPRI    =       LBSPRI+1        ;Current job priority (byte)
        OB      LPARNT          ;Index number of parent job
        OBT     LSW             ;Line status word
        OB      LSW2            ;Additional line status
        OB      LSW2S           ;Copy of LSW2 used for reset on prog exit
        OBH     ILSW2           ;Initial values for LSW2
        OBT     LSW3            ;Additional line status flags
        OB      LSW4            ;Additional line status flags
        OBT     LSW5            ;More line status flags
        OBT     LSW6            ;Line status table # 6
        OB      LSW7            ;Line status table # 7
        OB      LSW8            ;Line status table # 8
        OB      LSW9            ;Line status table # 9
        OBT     LSW10           ;Line status table # 10
        OB      LSW11           ;Line status table # 11
        OBT     LCLUNT          ;CL unit index number if connected as CL line
        OBP     ITRMTP          ;Initial terminal type code
        OBT     LTRMTP          ;Current terminal type code
        OBH     LNAME           ;Descriptive name for line
        OB      LMEMIN          ;# pages of memory needed to inswap job
        OB      LPARBS          ;PAR base address for job
        OB      LCXPAR          ;Value for KPAR6 to map to job context block
        OB      LNBLKS          ;# pages of memory currently assigned to job
        OB      LNSBLK          ;# pages of memory used by PLAS regions
        OB      LTTPAR          ;Physical memory PAR value for terminal buffer
        OB      LQUAN           ;Job's execution quantum
        OB      LITIME          ;Time job is held in "interactive" state
        OB      LIOHLD          ;Hold time for I/O starts while starting swap
        OB      LMINQ           ;Minimum core-residency time
        OB      LHIPCT          ;Controls # high-prio quantum periods job gets
        OB      LIOCNT          ;# active i/o operations for job
        OB      LBASE           ;Base page # assigned to job
        OBH     LHIRBB          ;Start of silo input ring buffer
        OBH     LHIRBE          ;End of silo input ring buffer
        OBH     LHIRBA          ;Allocated size of silo input ring buf
        OBH     LHIRBS          ;Free space in silo input ring buffer
        OBH     LHIRBP          ;Pointer where to store next char in buffer
        OBH     LHIRBG          ;Pointer where to get next char from buffer
        OBH     LHIRBC          ;Autoflow control stop/start char count limits
        OBT     LINSIZ          ;Size of input character buffer
        OB      LINBUF          ;Start of input buffer
        OB      LINEND          ;End of input buffer
        OB      LINNXT          ;Where next input char goes
        OB      LINPNT          ;Where to get next char read
        OB      LINCNT          ;# of chars in input buffer
        OB      LINSPC          ;# free bytes in input buffer
        OB      LACTIV          ;# of activation chars pending
        OB      LAFSIZ          ;Field width for activation condition
        OB      LFWLIM          ;Field width limit
        OB      LSTACT          ;Position of last activation char
        OB      LINCUR          ;Pos of cursor at start of line
        OBT     LOTSIZ          ;Size of output buffer
        OB      LOTBUF          ;Start of output buffer
        OB      LOTEND          ;End of output buffer
        OB      LOTNXT          ;Place to put next output char
        OB      LOTPNT          ;Place to get next output char
        OB      LOTSPC          ;Space left in output buffer
        OB      LWINDO          ;Pointer to current display window block
        OBH     LCDTYP          ;Type of communications device (CDX$xxx)
        OBH     LINIR           ;Terminal input service routine
        OBH     LOUTIR          ;Terminal output service routine
        OBH     INVEC           ;Input interrupt vector loc
        OBH     RSR             ;Receiver status register address
        OBH     RBR             ;Receiver buffer register
        OBH     TSR             ;Transmitter status register
        OBH     TBR             ;Transmitter buffer register
        OBH     LDHB1B          ;Base of DMA buffer 1
        OBH     LDHB1P          ;Pointer into DMA buffer 1
        OBH     LDHB2B          ;Base of DMA buffer 2
        OBH     LDHB2R          ;Remaining byte count for buffer 2
        OBH     LDHB2S          ;Suspended pointer for buffer 2
        OBH     LCXTBL          ;Pointer to character translation table
        OBP     LSECPT          ;Pointer to secondary line # table
        OBP     LXCL            ;CL unit to which line is cross connected
        OB      LCMPL           ;Head of chain of completion requests for job
        OB      LCMQHD          ;Queue head for completed message requests
        OB      LMONHD          ;Queue head for job monitor blocks
        OB      LSUCF           ;Start-up command file
        OB      LSWPBK          ;Block # in swap file
        OB      LJSW            ;User's JSW
        OB      LEMTPC          ;PC of last user-mode emt
        OB      LSCCA           ;.SCCA control word address
        OB      LSPND           ;.SPND counter for job
        OB      LBRKCQ          ;Break character completion queue entry
        OB      LTTCR           ;Completion routine for TT input activation
        OB      LBRKCH          ;Break character for line
        OB      LCOL            ;Current column position
        OBP     LMSGBF          ;Send message pointer
        OB      LSNDCH          ;Last char sent
        OB      LESRTN          ;Echo suppression routine
        OB      LESCHR          ;Echo suppression char code
        OB      LRBFIL          ;Rubout filler for line
        OB      LTSCMD          ;Pending special action command
        OB      LNSPAC          ;# of special activation chars
        OB      LSPACT          ;Point to special actv char tbl
        OB      LPROJ           ;Project #
        OB      LPROG           ;Programmer #
        OB      LCPUHI          ;High-order CPU time
```

```
                DB      LCPULO          ;Low-order CPU time
                DB      LCONTM          ;Connect time
                DBP     LCDTIM          ;Lost-carrier disconnect time
                DBP     LOFFTM          ;Allowed logoff time before DTR drop for line
                DBP     LABTIM          ;Autobaud control timer
                DB      LRDTIM          ;TT read timeout
                DB      LRTCHR          ;TT read timeout activation character
                DB      LSLEPL          ;.TWAIT sleep time for job (low-order)
                DB      LSLEPH          ;.TWAIT sleep time for job (high-order)
                DBH     LMXNUM          ;Index # of mux controlling line
                DBH     LMXPRM          ;Line parameters (speed, parity, stop bits)
                DB      LPRG1           ;1st 3 chars of running program name (rad50)
                DB      LPRG2           ;2nd 3 chars of running program name (rad50)
        LUNAME  =       .-12.           ;Offset user name table by size of 1 entry
                .BLKB   NLINES*12.      ;Store 12 char user name here
        LMXLN   =       RBR             ;# of this line within mux group
```

```
;
;  Define subprocess mapping tables
;
LNMAP   =       .-2
        .NLIST  BIN
I       =       0
        .REPT   NPL
I       =       I+2
        .WORD   I
        .ENDR
;  Define LNPRIM table
LNPRIM  =       .-2
I       =       0
        .REPT   NPL+NDL
I       =       I+2
        .WORD   I
        .ENDR
        .IF     NE,NSL
        .REPT   NSL
I       =       I+2             ;Keep count for NIOL if any
        .WORD   0
        .ENDR
        .ENDC
        .IF     NE,NIOL
        .REPT   NIOL
I       =       I+2
        .WORD   I
        .ENDR
        .ENDC
        .LIST   BIN
;
;  Generate interrupt receivers
;
;  Input interrupt vector
        .NLIST  BIN
        .REPT   TNHL
        INCB    LINNUM          ;COUNT UP WHICH LINE INTERRUPTED
        .ENDR
INRECV: JMP     ININT           ;ENTER INTERRUPT SERVICE ROUTINE
; Output interrupt vector
LXX     =       2
OTRECV:
        .REPT   TNHL
        JSR     R4,@#DLINT
        .WORD   LXX
LXX     =       LXX+2
        .ENDR
        .LIST   BIN
        .LIST   MD
        .ENDM   TBLDEF
```

```
                        ;-----------------------------------------------------------------------
                        ;  The CLDEF macro begins a line definition block for a serial communications
                        ;  line that will be used as a dedicated CL line.
                        ;  The CLDEF macro is similar to a LINDEF and can occur inside or outside
                        ;  of a MUXDEF block.
                        ;  The form of the CLDEF macro outside a MUXDEF block is:
                        ;       CLDEF   line_number,vector_address,RSR_address
                        ;  The form of the CLDEF macro inside a MUXDEF block is:
                        ;       CLDEF   line_number,mux_line_number
                        ;
                                .MACRO  CLDEF   AIOLN,ARG1,ARG2
                        ;
                        ;  Check to make sure the CL unit number is valid
                        ;
                        IOLN    =       AIOLN
                                .IF     GE <IOLN-CLTOTL>
                        .ERROR ;O CL unit number exceeds # declared CL units
                        IOLN    =       0
                                .ENDC
                        ;
                        ;  See if this CL unit has already been assigned to another line
                        ;
                                .IF     NDF     CLUD'AIOLN
                        CLUD'AIOLN      =       1
                                .ENDC
                                .IF     GT <CLUD'AIOLN-2>
                        .ERROR ;CL unit AIOLN used more than once
                                .ENDC
                        CLUD'AIOLN      =       CLUD'AIOLN+1
                        ;
                        ;  Set flag saying we are doing an CLDEF definition and then invoke LINDEF.
                        ;  Note, the LINEND macro will reset IOLFLG.
                        ;
                        IOLFLG  =       1               ;We are inside CLDEF
                                LINDEF  ARG1 ARG2
                                .ENDM   CLDEF
                        ;
                        ;-------------------------------------------------------
                        ;  The LINDEF macro begins a line definition block.
                        ;  A line definition block is required for each primary
                        ;  (real) line.  A line definition block begins with
                        ;  a LINDEF macro call, may include other macro calls
                        ;  such as LFLAGS and must end with a LINEND macro call.
                        ;  there are two arguments to the LINDEF macro:
                        ;  Arg 1 is the input interrupt vector address or mux line #.
                        ;  Arg 2 is the address of the receiver status register.
                        ;  Arg 3 is 'OPERATOR' to specify line is control terminal.
                        ;
        000000          LN      =       0               ;Current line number
        000000          BO      =       0               ;1 if inside LINDEF block
        000000          LX      =       0               ;Line index number
        000000          IOLFLG  =       0               ;1 if inside an CLDEF block
        000000          IOLN    =       0               ;Number of dedicated CL line
        000000          NPLDF   =       0               ;Number of declared primary T/S lines
        000000          NCLDF   =       0               ;Number of CL lines that have been defined
        000000          NDLDF   =       0               ;Number of declared detached jobs
                        ;
        .MACRO  LINDEF  AINTAD,ARSR,AOPR
        .IF     NE BO                   ;SEE IF LAST BLOCK LEFT OPEN
.ERROR  1; Missing LINEND on last line
        LINEND                          ;CLOSE OFF PREVIOUS BLOCK
        .ENDC
BO      =       1                       ;SAY WE'RE INSIDE A BLOCK
NAMDON  = 0                             ;SAY NO NAME DECLARED YET
CMFDON  = 0                             ;SAY NO SUCF DECLARED YET
;
;  Update current line #
;  and make sure we don't overflow tables
;
        .IF     EQ,IOLFLG               ;If not inside an CLDEF block
LN      =       LN+1                    ;Line counter
NPLDF   =       NPLDF+1                 ;Count number of primary lines
LX      =       LX+2                    ;Line index
CLX     =       LX
        .IF     GT <LN-NPL>
.ERROR  2; More lines than declared with TBLDEF
        .MEXIT
        .ENDC  ;GT <LN-NPL>
        .IFF    ;EQ,IOLFLG              ;If inside an CLDEF block
CLX     =       FSTIOL+<2*NCLDF>;Get line index # of this line
NCLDF   =       NCLDF+1                 ;Count # of dedicated CL lines
        .IF     GT <NCLDF-NIOL> ;Don't exceed # CL lines declared in TBLDEF
.ERROR  0; More CL lines than declared in TBLDEF
        .MEXIT
        .ENDC   ;GT <NCLDF-NIOL>
S       =       .
.       =       LCLUNT+CLX              ;Store CL unit # into table for this line
        .WORD   2*IOLN
.       =       S
        .ENDC
;
; *** Do this for DL11 lines only ***
;
        .IF     EQ CURMX                ;True if not within mux definition block
CURMXL  =       0
;
;  Set up interrupt vector addresses
;
        .IF     B AINTAD
        .IF     EQ,IOLFLG
.ERROR 3; Missing interrupt address (arg 1)
        .IFF
.ERROR 3; Missing interrupt address (arg 2)
        .ENDC
        .MEXIT
        .ENDC
        VECCHK  AINTAD,7
S       =       .
.       =       INVEC+CLX
        .WORD   AINTAD
.       =       S
;
;  Set up DL11 register addresses
;
```

```
        .IF     B ARSR
        .IF     EQ,IOLFLG
.ERROR  4 ; Missing receiver register address (arg 2)
        .IFF
.ERROR 4; Missing receiver register address (arg 3)
        .ENDC
        .MEXIT
        .ENDC
        SRCHK   ARSR
S       =       .
.       =       RSR+CLX
        .WORD   ARSR
.       =       RBR+CLX
        .WORD   ARSR+2
.       =       TSR+CLX
        .WORD   ARSR+4
.       =       TBR+CLX
        .WORD   ARSR+6
        .IF     NB AOPR         ;SEE IF THIS IS CONTROL TERMINAL
.       =       CTRLTT          ;REMBER CONTROL TERMINAL #
        .WORD   CLX
        .ENDC
.       =       S
;
;   *** Do this for DZ11 and DH11 lines only ***
;
        .IFF
S       =       .
.       =       LMXNUM+CLX      ;MUX UNIT NUMBER
        .WORD   CURMX
        .IF     B AINTAD
.ERROR 0;Missing multiplexer line number
CURMXL  =       0
        .IFF
CURMXL  =       AINTAD
        .ENDC
.       =       LMXLN+CLX       ;LINE WITHIN MUX
        .WORD   CURMXL
        .IF     NB ARSR
.       =       CTRLTT
        .WORD   CLX
        .ENDC
.       =       S
        .ENDC
;
;   *** Do this for all lines ***
;
S       =       .
.       =       LCDTYP+CLX      ;Communications device type index
        .WORD   CURCDX
.       =       S
;
;  Establish default values in case user doesn't specify
;  them inside line definition block.
;
DFLAGS  =       NRMFLG          ;DEFAULT LINE CONTROL FLAGS
        .IF     EQ,IOLFLG       ;If this is not an CLDEF
```

```
DIS     =       DINSPC          ;INPUT BUFFER SIZE
DOS     =       DOTSPC          ;OUTPUT BUFFER SIZE
        .IFF                    ;If this is an CLDEF
DIS     =       0               ;Input ring buffer size
DOS     =       CLORSZ          ;Output ring buffer size
        .IIF    LE,DOS  DOS = 32.       ;Don't allow <= 0 size
        .ENDC
;
;  Establish default values for character silos
;
SILSIZ  =       0
SILXOF  =       0
SILXON  =       0
;
        .ENDM   LINDEF
        ;---------------------------------------------------------
        ;  The FLAGS macro is used to set flags in the ILSW2 table.
        ;  The one argument to flags is the value to be stored
        ;  in ILSW2.
        ;
                .MACRO  FLAGS   AFLG
        DFLAGS  =       AFLG            ;SAVE FOR LINEND
                .ENDM   FLAGS
        ;-----------------------------------------------------------------------
        ;  The TRMTYP macro is used to declare the terminal type.
        ;
                .MACRO  TRMTYP  ATYP
                .IF     EQ,IOLFLG       ;Do not do for CL lines
        S       =       .
        .       =       ITRMTP+CLX
                .WORD   ATYP
        .       =       S
                .ENDC
                .ENDM   TRMTYP
        ;
        ;------------------------------------------------------------------------
        ;  The NAME macro is used within a line definition block to declare
        ;  a commentary name for the line which is displayed with the
        ;  SHOW TERMINALS keyboard command.
        ;
000000          .CSECT  NAMSEC
000000  NAMSEC:
002344          .CSECT  TSGEN
                .MACRO  NAME    NAMSTR
                .CSECT  NAMSEC
        NAMPTR  =       .
                .ASCIZ  \NAMSTR\
        LNMTOP  = .
        ;
                .CSECT  TSGEN
        S       =       .
        .       =       LNAME+CLX
                .WORD   NAMPTR
        .       =       S
        NAMDON  = 1
                .ENDM   NAME
        ;
        ;-------------------------------------------------
        ;  The BUFSIZ macro is used to set the size of
        ;  the input and output character buffers.
        ;  Arg 1 = Input buffer size (# of characters)
        ;  Arg 2 = output buffer size (# of characters)
        ;
                .MACRO  BUFSIZ  AIS,AOS
        DIS     =       AIS
                .IF     NB AOS
        DOS     =       AOS             ;SET OUTPUT BUFFER SIZE
                .ENDC
                .ENDM   BUFSIZ
        ;
        ;-----------------------------------------------------------------------
        ;  The SILO macro is used to set up information about the
```

```
                ;  terminal input character silo.
                ;   Arg 1 = Size of the silo buffer.
                ;   Arg 2 = Free space remaining when XOFF is to be sent.
                ;   Arg 3 = Number of chars remaining when XON is to be sent.
                ;
                        .MACRO  SILO    ASIZ,AXOF,AXON
                SILSIZ  =       ASIZ
                SILXOF  =       AXOF
                SILXON  =       AXON
                        .ENDM   SILO
                ;
                ;-----------------------------------------------------
                ;  The PAGE macro is used to establish the number
                ;  of lines on a page.
                ;
                        .MACRO  PAGE ALINES
                        .ENDM   PAGE
                ;
                ;----------------------------------------------------
                ;  The CMDFIL macro is used to declare a command file which
                ;  is to be executed when the line is started.
                ;
000000                  .CSECT  CMFSEC
000000          CMFSEC:
002344                  .CSECT  TSGEN
                        .MACRO  CMDFIL  ARG
                        .IF     EQ,IOLFLG               ;Only do for non-CL lines
                        .CSECT  CMFSEC
                NAMPTR  = .
                        .ASCIZ  /ARG/
                CMFTOP  = .
                        .CSECT  TSGEN
                S       =       .
                .       =       LSUCF+CLX
                        .WORD   NAMPTR
                .       =       S
                        .ENDC
                CMFDON  = 1
                        .ENDM   CMDFIL
                ;
                ;---------------------------------------------------
                ;  The LINPRM macro is used to specify parameters
                ;  for lines.
                ;  There are three parameters:
                ;  1. Speed select code.
                ;  2. Even (0) / Odd (1) parity (No longer used).
                ;  3. One (0) or two (1) stop bits
                ;
                        .MACRO  LINPRM  ASPD,APAR,ASTOP
                PERR    =       0
                .IIF    GT,ASPD-17      PERR=1
                .IIF    GT,APAR-2       PERR=1
                .IIF    LT,ASTOP-1      PERR=1
                .IIF    GT,ASTOP-2      PERR=1
                        .IF     NE,PERR
                .ERROR  ;Invalid speed, parity or stop-bits parameter in LINPRM
                        .ENDC
                XPAR    =       100
                CARLEN  =       20
                        .IF     GT,<APAR-1>
                XPAR    =       0
                CARLEN  =       30
                        .ENDC
                LSTPRM  =       <ASPD*400>
                        .ENDM   LINPRM
                ;
                ;-----------------------------------------------------------------------
                ;  The SPEED macro is used to specify baud rates for lines
                ;  as well as number of data bits and parity selection.
                ;  The default is 9600 baud with 8. data bits and no parity.
                ;  The form of the macro is:
                ;
                ;       SPEED   speedcode,data_bits,parity
                ;
                ;  where   speedcode is selected from the speed code table
                ;            and is of the form S9600, for example
                ;    and   data_bits = 7 or 8.
                ;    and   parity = EVEN, ODD or NONE
                ;
007000          LSTPRM  = <S9600*400>!<20000*0>!NONE    ;Default to 4800,8,N
                ;
                        .MACRO  SPEED   SPDCOD,NBITS,PARCOD
                        .IF     DF,S'SPDCOD
                SPDVAL  =       S'SPDCOD
                        .IFF    ;DF,S'SPDCOD
                        .IF     DF,SPDCOD
                SPDVAL  =       SPDCOD
                        .IFF    ;DF,SPDCOD
                .ERROR  O;Invalid speed specified with SPEED macro
                SPDVAL  =       14.
                        .ENDC   ;NDF,S'SPDCOD
                        .ENDC   ;DF,S'SPDCOD
                        .IF     B,NBITS
                NDBITS  = 8.
                        .IFF    ;B,NBITS
                NDBITS  = NBITS
                        .IF     LT,<NDBITS-7>
                .ERROR  ;SPEED macro only accepts 7 or 8. data bits
                NBDITS  = 8.
                        .ENDC   ;LT,<NDBITS-7>
                        .IF     GT,<NDBITS-8.>
                .ERROR  ;SPEED macro only accepts 7 or 8. data bits
                NDBITS  = 8.
                        .ENDC   ;GT,<NDBITS-8.>
                        .ENDC   ;B,NBITS
                        .IF     B,PARCOD
                PARITY  = NONE
                        .IFF    ;B,PARCOD
                PARITY  = PARCOD
                        .IF     NE,PARITY       ;NOT NONE?
                        .IF     NE,<PARITY-EVEN> ;NOT EVEN?
                        .IF     NE,<PARITY-ODD>  ;NOR ODD?
                .ERROR  ;Parity must be EVEN, ODD or NONE in SPEED macro
                PARITY  = NONE
                .ENDC   ;NOT ODD
                .ENDC   ;NOT EVEN
                .ENDC   ;EVEN OR ODD
                .ENDC   ;B,PARCOD
LSTPRM  =               <SPDVAL*400>!<20000*<8.-NDBITS>>!PARITY
                .ENDM   SPEED
;
;--------------------------------------------------------------
;  The VECCHK macro is called to see if a line vector
;  address is reasoanble.
;
                .MACRO  VECCHK  VA,MASK
VERR=0
.IIF    LT,VA-60        VERR=1
; Although RT-11 V5.3 reserves 470 and 474, we do not (for now).
.IIF    GE,VA-500       VERR=1
.IIF    NE,VA&MASK      VERR=1
                .IF     NE,VERR
.ERROR  ;Invalid vector address for this line
                .ENDC
                .ENDM   VECCHK
;
;------------------------------------------------------------------------
;  SRCHK macro checks the validity of a receiver status
;  register address
;
                .MACRO  SRCHK   SR
SRERR=0
.IIF    LT,SR-160000    SRERR=1
.IIF    NE,SR&7         SRERR=1
                .IF     NE,SRERR
.ERROR  ;Invalid status register address for this line
                .ENDC
                .ENDM   SRCHK
```

```
        ;----------------------------------------------------
        ;  The LINEND macro is used to close out a line
        ;  definition block.
        ;
000000          .CSECT   SASECT
000000  SASECT:
002344          .CSECT   TSGEN
                .MACRO   LINEND
        ;  Make sure we're inside a line def block.
                .IF      EQ BO
        .ERROR  6 ; Missing LINDEF for this line
        BO      =        0
                .MEXIT
                .ENDC
        BO      =        0                ;END LINDEF BLOCK
        ;
        ;  Make sure NAME and CMDFIL reserve at least 1 byte
                .IF      EQ,NAMDON
                NAME     <>
                .ENDC
                .IF      EQ,CMFDON
                CMDFIL   <>
                .ENDC
        ;
        ;  Define input and output character buffer sizes for line
        ;  Define input buffer
        S       =        .
        .       =        LINSIZ+CLX
                .WORD    DIS-1            ;DEFINE BUFFER SIZE
        .       =        S
        ;  Define output buffer
        S       =        .
        .       =        LOTSIZ+CLX
                .WORD    DOS              ;DEFINE BUFFER SIZE
        .       =        S
        ;
        ;  Define table for user defined activation characters.
        ;
                .IF      EQ,IOLFLG        ;Only do for non-CL lines
        S       =        .
                .CSECT   SASECT
        T       =        .
                .BLKB    MXSPAC
                .CSECT   TSGEN
        .       =        LSPACT+CLX
                .WORD    T
        .       =        S
                .ENDC                     ;End conditional (EQ,IOLFLG)
        ;
        ;  Items for primary lines only.
        ;
        LF      =        0                ;Assume this is not a primary or CL line
                .IF      NE,IOLFLG        ;If doing a CL line definition
        LF      =        1                ;Treat like primary line
                .IFF                      ;If not doing a CL line definition
                .IF      LE <LN-NPL>      ;Do only if this is a primary line
        LF      =        1                ;Gen code
        .ENDC                   ;End conditional (LE <LN-NPL>)
        .ENDC                   ;End conditional (NE,IOLFLG)
;
        .IF     NE,LF           ;Do if primary line or CL line
;
;   Define line control flags
;
S       =       .
.       =       ILSW2+CLX
        .WORD   DFLAGS          ;SET THE FLAGS
.       =       S
;
;   Defile silo buffer size information
;
S       =       .
.       =       LHIRBA+CLX      ;Silo size
        .WORD   SILSIZ
.       =       LHIRBC+CLX      ;XOFF/XON control info
        .BYTE   SILXOF          ;XOFF point
        .BYTE   SILXON          ;XON point
.       =       S
;
;   Define line parameters (Required for DZ11 & DH11 lines, optional for DL11)
;
        .IF     NDF,LSTPRM
LSTPRM  =       0
        .IF     NE CURMX
.ERROR  0;Missing SPEED macro call
        .ENDC           ;End conditional (NE CURMX)
        .ENDC           ;End conditional (NDF,LSTPRM)
S       =       .
.       =       LMXPRM+CLX
        .WORD   <LSTPRM>!<CURMXL>
.       =       S
;
;   Define subprocess table.
;
        .IF     EQ,IOLFLG       ;Do if not inside CLDEF block
        .IF     NE MAXSEC
S       =       .
.       =       LSECPT+CLX
        .WORD   S
.       =       S
        .REPT   MAXSEC
        .BYTE   0
        .ENDR
        .EVEN
        .ENDC           ;End conditional (NE MAXSEC)
        .ENDC           ;End conditional (EQ,IOLFLG)
;
;   Define chracter translation table
;
        .IF     NE MXTTCT
S       =       .
.       =       LCXTBL+CLX
        .WORD   S
.       =       S
```

```
        .REPT   MXTTCT+1
        .WORD   0
        .ENDR
        .EVEN
        .ENDC           ;End conditional (NE MXTTCT)
;
        .ENDC           ;End conditional (NE,LF)
;
;  Reset flag that says we are inside an CLDEF block
;
IOLFLG  =       0       ;No longer inside an CLDEF block
        .ENDM   LINEND
;
;-------------------------------------------------------------------
;  The CLEND macro is like the LINEND macro except it is used to
;  terminate a communication line definition started with a CLDEF macro.
;
        .MACRO  CLEND
        LINEND
        .ENDM   CLEND
;
;----------------------------------------------------------------
;  The DETACH macro is used to define a start-up command file
;  To be run on a detached line when TSX-Plus is started.
;  The one argument to DETACH is the name of the command file.
;
        .MACRO  DETACH  NAME
        .IF     NE      BO
.ERROR  1; Missing LINEND on last line
        LINEND
        .ENDC
NDLDF   =       NDLDF+1         ;Count number of detached jobs
LN      =       LN+1
LX      =       LX+2
CLX     =       LX
        .IF     LE,<NDL>
.ERROR  2; DETACH macro declared with no detached lines
        .MEXIT
        .ENDC
        .IF     GT,<LN-NPL-NDL>
.ERROR  2; More lines than declared with TBLDEF
        .MEXIT
        .ENDC
;  Store startup command file name
S       =       .
.       =       LSUCF+CLX
        .WORD   S
.       =       S
        .IF     NB,<NAME>
        .ASCIZ  /NAME/
        .ENDC
        .REPT   <DETCBS+1-<.-S>>
        .BYTE   0
        .ENDR
        .EVEN
        .ENDM   DETACH
;
```

```
                        ;-----------------------------------------------------------------------
                        ;  The SYSPS macro is used to define a system password which may be
                        ;  required to be entered for some lines before the normal logon
                        ;  sequence begins.
                        ;
        000000                  SYSPSS  = 0
                                .MACRO  SYSPS   STRING
                                SYSPSS = 1
                        SYPSWD: .ASCIZ  \STRING\
                                .IF     GT,<21.-<.-SYPSWD>>
                                .REPT   <21.-<.-SYPSWD>>
                                .BYTE   0
                                .ENDR
                                .ENDC   ;GT,<21.-<.-SYPSWD>>
                                .EVEN
                                .ENDM   SYSPS

                        ;-----------------------------------------------------------------------
                        ;  The RTDEF macro is used to declare information about shared
                        ;  run-time systems.
                        ;
                        ;  The 3 arguments to RTDEF are
                        ;  1. 12 character name of run-time system file.
                        ;  2. R or RW indicating Read-only or Read-Write access.
                        ;  3. Number of blocks to skip at the front of the file.
                        ;
                                .MACRO  RTDEF   NAME,RFLAG,SKIP
                                .CSECT  RDBSEC
                        T       =       .
                                .RAD50  /'NAME'/
                                .IF     NE,<<.-T>-8.>
                        .ERROR  0;Run-time system name was not correctly specified
                                .ENDC
                                .WORD   0,0
                                .IF     IDN,RFLAG,RW
                                .BYTE   RF$WRT
                                .IFF
                                .BYTE   0
                                .ENDC
                                .BYTE   SKIP
                                .CSECT  TSGEN
                        NUMRDB  =       NUMRDB+1
                                .ENDM   RTDEF
```

```
;
;----------------------------------------------------------
;  The DHDEF macro is used to declare the beginning
;  of a block of lines which are attached to a DH11
;  multiplexer.  All line definition blocks up to
;  the next MUXEND macro call will be connected to
;  the DH11.
;  There are four arguments to DHDEF:
;  1. The interrupt vector address of the mux receiver.
;  2. The address of the mux control and status register.
;  3. The interrupt vector address of the associated DM11.
;  4. The CSR address of the associated DM11.
;
        .MACRO  DHDEF   AVEC,ACSR,ADMVEC,ADMADR
        .IF     NE CURMX
.ERROR  1; Missing MUXEND macro
        MUXEND
        .ENDC
LSTMX   =       LSTMX+2
CURMX   =       LSTMX
CURCDX  =       CDX$DH                  ;Lines within this block are connected to DH11
DHUSE   =       1                       ;Set flag saying DH11 support is needed
        VECCHK  AVEC,7
        SRCHK   ACSR
        .IF     NE,ADMVEC
        VECCHK  ADMVEC,3
        .ENDC
        .IF     NE,ADMADR
        SRCHK   ADMADR
        .ENDC
$       =       .
.       =       MXTYPE+CURMX            ;Type of multiplexor
        .WORD   CDX$DH                  ;Type = DH11
.       =       MH$SCR+CURMX            ;Status and control register address
        .WORD   ACSR
.       =       MH$RCR+CURMX            ;Received character register
        .WORD   ACSR+2
.       =       MH$LPR+CURMX            ;Line parameter register
        .WORD   ACSR+4
.       =       MH$CAR+CURMX            ;Current address register
        .WORD   ACSR+6
.       =       MH$BCR+CURMX            ;Byte count register
        .WORD   ACSR+10
.       =       MH$BAR+CURMX            ;Buffer active register
        .WORD   ACSR+12
.       =       MH$BRK+CURMX            ;Break control register
        .WORD   ACSR+14
.       =       MH$SSR+CURMX            ;Silo status register
        .WORD   ACSR+16
.       =       DM$CSR+CURMX            ;DM11 Control Status register
        .WORD   ADMADR
.       =       DM$LSR+CURMX            ;DM11 Line status register
        .WORD   ADMADR+2
.       =       MXVEC+CURMX             ;DH11 Interrupt vector address
        .WORD   AVEC
.       =       DM$VEC+CURMX            ;DM11 Interrupt vector address
        .WORD   ADMVEC
```

```
     58                              .               =       S
     59                                              .ENDM   DHDEF
```

```
;
;-----------------------------------------------------
;  The DHVDEF macro is used to declare the beginning
;  of a block of lines which are attached to a DHV11
;  multiplexer.  All line definition blocks up to
;  the next MUXEND macro call will be connected to
;  the DHV11.
;  There are two arguments to DHVDEF:
;  1. The interrupt vector address of the mux receiver.
;  2. The address of the mux control and status register.
;
        .MACRO  DHVDEF  AVEC,ACSR
        .IF     NE CURMX
.ERROR  1; Missing MUXEND macro
        MUXEND
        .ENDC
LSTMX   =       LSTMX+2
CURMX   =       LSTMX
CURCDX  =       CDX$VH          ;Lines within this block connected to DHV11
DHUSE   =       1               ;Set flag saying DHV11 support is needed
        VECCHK  AVEC,7
        SRCHK   ACSR
S       =       .
.       =       MXTYPE+CURMX    ;Type of multiplexor
        .WORD   CDX$VH          ;Type = DHV11
.       =       VH$CSR+CURMX    ;Status and control register address
        .WORD   ACSR
.       =       VH$DBR+CURMX    ;Data buffer register
        .WORD   ACSR+2
.       =       VH$LPR+CURMX    ;Line parameter register
        .WORD   ACSR+4
.       =       VH$LSR+CURMX    ;Line Status Register
        .WORD   ACSR+6
.       =       VH$LCR+CURMX    ;Line Control Register
        .WORD   ACSR+10
.       =       VH$BA1+CURMX    ;Buffer Address register 1
        .WORD   ACSR+12
.       =       VH$BA2+CURMX    ;Buffer Address register 2
        .WORD   ACSR+14
.       =       VH$BCR+CURMX    ;Byte Count Register
        .WORD   ACSR+16
.       =       MXVEC+CURMX     ;Interrupt vector address
        .WORD   AVEC
.       =       S
        .ENDM   DHVDEF
;
;-----------------------------------------------------
;  The DHUDEF macro is used to declare the beginning
;  of a block of lines which are attached to a DHU11
;  multiplexer.  All line definition blocks up to
;  the next MUXEND macro call will be connected to
;  the DHU11.
;  There are two arguments to DHUDEF:
;  1. The interrupt vector address of the mux receiver.
;  2. The address of the mux control and status register.
;
        .MACRO  DHUDEF  AVEC,ACSR
```

```
	DHVDEF	AVEC,ACSR	;Handle same as DHV11
	.ENDM	DHUDEF
```

```
;
;-----------------------------------------------------
;  The MUXDEF macro is used to declare the beginning
;  of a block of lines which are attached to a DZ11
;  multiplexer.  All line definition blocks up to
;  the next MUXEND macro call will be connected to
;  the DZ11.
;  There are two arguments to MUXDEF:
;  1. The interrupt vector address of the mux receiver.
;  2. The address of the mux control and status register.
;
        .MACRO  MUXDEF  AVEC,ACSR
        .IF     NE CURMX
.ERROR  1; Missing MUXEND macro
        MUXEND
        .ENDC
LSTMX   =       LSTMX+2
CURMX   =       LSTMX
CURCDX  =       CDX$DZ          ;Lines within this block are connected to DZ11
        VECCHK  AVEC,7
        SRCHK   ACSR
S       =       .
.       =       MXTYPE+CURMX    ;Multiplexor type
        .WORD   CDX$DZ          ;Type = DZ11
.       =       MXCSR+CURMX
        .WORD   ACSR
.       =       MXLPR+CURMX
        .WORD   ACSR+2
.       =       MXTCR+CURMX
        .WORD   ACSR+4
.       =       MXDTR+CURMX
        .WORD   ACSR+5
.       =       MXTBUF+CURMX
        .WORD   ACSR+6
.       =       MXCAR+CURMX
        .WORD   ACSR+7
.       =       MXVEC+CURMX
        .WORD   AVEC
.       =       S
        .ENDM   MUXDEF
;
;  Alternate name for MUXDEF macro
;
        .MACRO  DZDEF   AVEC,ACSR
        MUXDEF  AVEC,ACSR
        .ENDM   DZDEF
;
;-------------------------------------------------------
;  The MUXEND macro is called to declare the end of
;  a set of lines connected to a DZ11 or DH11.
;
        .MACRO  MUXEND
        .IF     EQ CURMX
.ERROR  6; Missing earlier MUXDEF
        .ENDC
CURMX   =       0
CURCDX  =       CDX$DL          ;Following lines are connected to DL11's
```

```
     58                                          .ENDM   MUXEND
```

```
;-----------------------------------------------------
;  The SPOOL macro is used to declare those devices which
;  are to be spooled by TSX-Plus (such as line printers).
;  There are seven arguments to spool:
;    1) Number of devices to be spooled (may be zero)
;    2) Number of spool files allowed to be open.
;    3) Number of buffers for spooler to use.
;    4) Number of blocks in spool disk file.
;    5) List of 3 character names of devices to be spooled.
;    6) 0 for 'nohold' mode, 1 for 'hold' mode.
;    7) # of blocks which will be remembered for back up.
;
        .MACRO  SPOOL   SND,SNF,SNB,SNDB,SNAM,SHLD,SNBU
;  Define number of spooled devices
SPLND   =       SND
SNBUX   =       SNBU
        .IF     EQ,SNBU
SNBUX   =       1
        .ENDC
PVSPBL  =       SNBUX+10.               ;# PRIVATE BLOCKS PER DEV
SNDBX   =       SNDB            ;TOTAL # OF SPOOL BLOCKS
        .IF     LT <SNDB-<SND*PVSPBL>-2>
SNDBX   =       <SND*PVSPBL>+2
        .ENDC
        .IF     GT,SPLND
;**
;**  Assemble this code if there are spooled devices.
;**
SPLNF   =       SNF             ;DEFINE # OF SPOOL FILES
SPLNB   =       SNB             ;DEFINE # OF SPOOL BUFFERS
NESB:   .WORD   SPLNB
;  DEFINE SPOOL BUFFERS
        .IF     EQ,SPLNB        ;THERE MUST BE AT LEAST 1 BUFFER
.ERROR  ;There must be at least 1 buffer for spooler
SPLNB   =       1               ;FORCE 1 BUFFER
        .ENDC
SPLBHD: .WORD   0               ;HEAD OF FREE BUFFER CHAIN
        .IF     EQ,SPLNF        ;Make sure we.have at least 1 file
.ERROR  ;There must be at least 1 spool file
SPLNF   =       1               ;FORCE 1 FILE
        .ENDC
;
;  Define spool device control blocks (SDCB)
;
SDCB:
        .REPT   SPLND
        .WORD   0,0,0,0,0       ;SDCHAN
        .WORD   0,0,0,0,0,0
        .WORD   0,0,0,0
;  INITIAL FORM NAME
        .ASCII  /STD   /        ;SDFORM
        .WORD   0,0             ;SDANAM
;  GEN INIT FLAGS
        .IF     NE,SHLD
        .WORD   SD$HLD          ;SDFLAG
        .IFF
        .WORD   0               ;SDFLAG
        .ENDC
        .WORD   0               ;SDSKIP
        .WORD   PVSPBL          ;SDFRBL
;   GEN BACKUP CELLS
        .REPT   SNBUX
        .WORD   0
        .ENDR
        .WORD   0               ;SDBULS = END OF SDBU
        .ENDR
SDCBND:                         ;END OF SDCB AREA
;   DEFINE SIZE OF SDCB
SDCBSZ  =       48.+<2*SNBUX>
SDBULS  =       SDCBSZ-4.
;
;   Define table of device names.
;
SPLDEV: .RAD50  /'SNAM'/        ;DEFINE TABLE OF NAMES
        .EVEN
SPLDVN:                         ;END OF TABLE
        .IF     NE,<<SPLDVN-SPLDEV>-<2*SND>>
.ERROR  ;Number of spooled devices not equal to number of names
        .ENDC
SPLANM: .ASCII  /'SNAM'/
        .EVEN
;   Reserve space for spool file channel block
SPLCHN: .BLKW   5
;
        .IFF
;**
;**  This code is assembled if there are no spooled devices.
;**
SPLND   =       0
SPLNF   =       0
SPLNB   =       0
SDCBSZ  =       1
SDBULS  =       1
;
SPLDEV:
SPLDVN:
SPLANM:
SPLBHD:
SPLCHN:
SDCB:
SDCBND:
NESB:
        .WORD   0               ;SAY ALL LISTS ARE EMPTY
;
        .ENDC
        .ENDM   SPOOL
```

```
                                   ;=================================================================
                                   ;  The TSX-Plus system manager alters values in the following
                                   ;  section to customize the system for a particular configuration.
                                   ;
                                   ;  System parameters:
                                   ;
                                   ;  Swap file device-file specification (do not place on VM).
                                   ;
002344  075250   100020   075150   SWDBLK: .RAD50  /SY TSXSWPTSX/
002352  100020
                                   ;
                                   ;  Spool file device-file specification (do not place on VM).
                                   ;
002354  075250   100020   074514   SPLBLK: .RAD50  /SY TSXSPLTSX/
002362  100020
                                   ;
                                   ;  PLAS region swap file specification (do not place on VM).
                                   ;
002364  075250   100020   071576   RSFBLK: .RAD50  /SY TSXRSFTSX/
002372  100020
                                   ;
                                   ;  File spec for file used to hold user defined command definitions (UCL)
                                   ;
002374  075250   100020   101704   UCLDAT: .RAD50  /SY TSXUCLTSX/
002402  100020
                                   ;
                                   ;  File spec for temp file used while processing IND command files
                                   ;
002404  075250   100020   035164   INDFIL: .RAD50  /SY TSXINDTSX/
002412  100020
                                   ;
                                   ;  Maximum amount of memory that can be used by any job (# K bytes).
                                   ;  This value must not exceed 64. (Kb)
                                   ;
        000100                     HIMEM   =       64.     ;Max memory that any job may use
                                   ;
                                   ;  Default memory size for jobs that will be in effect when the job
                                   ;  logs on.  (Specify in # K bytes).
                                   ;
        000100                     DFLMEM  =       64.     ;Default memory limit for jobs
                                   ;
                                   ;  SWAPFL controls whether TSX-Plus is allowed to swap jobs to disk if
                                   ;  insufficient memory is available to hold all active users.
                                   ;  The normal case (SWAPFL=1) allows TSX-Plus to do job swapping.
                                   ;  SWAPFL can be set to 0 (zero) in special situations such as when a
                                   ;  small number of lines are being supported on a floppy disk based system
                                   ;  that does not have room for a swap file.
                                   ;  If SWAPFL is set to zero the following actions occur:
                                   ;  1. No disk swap file is created.
                                   ;  2. A line will not be allowed to log on if there is insufficient
                                   ;     free memory space to support it.
                                   ;  3. Each job is allocated a memory size equal to DFLMEM (default job
                                   ;     memory size).
                                   ;  4. The MEMORY command cannot be used to change the job size.
                                   ;
        000001                     SWAPFL  =       1       ;1==>Allow job swapping; 0==>Do not swap.
                                   ;
```

```
                                 ;  If the system is generated with job swapping enabled (SWAPFL=1), then
                                 ;  the SWPSLT parameter controls the number of job slots allocated
                                 ;  in the swap file.  SWPSLT should be in the range 0 up to the
                                 ;  total number of jobs. If SWPSLT is set to zero, TSX-Plus will
                                 ;  automatically allocate one job slot in the swap file for each job.
                                 ;  SWPSLT may be set to a value less than the total number of jobs if
                                 ;  a small amount of job swapping is anticipated; however, a system
                                 ;  crash will occur if the system needs to swap a job out of memory
                                 ;  and no free slot is available in the swap file.
                                 ;  The SWPSLT parameter has no effect on non-swapping systems (SWAPFL=0).
                                 ;  The recommended setting for this parameter is 0 (zero).
                                 ;
        000012                   SWPSLT  =       10.     ;Number of job slots in swap file
                                 ;
                                 ;  Number of 512-byte blocks to allocate for swap file that is used
                                 ;  for extended memory PLAS (Program's Logical Address Space) regions
                                 ;  that are used by jobs that have virtual overlays or virtual arrays.
                                 ;  Note that this is the total space in the PLAS swap file for all
                                 ;  extended memory regions in use at any time by all jobs.
                                 ;  Note: In a non-swapping system (SWAPFL=0), SEGBLK must be non-zero
                                 ;  if PLAS support is wanted, but its value does not matter.
                                 ;
        000764                   SEGBLK  =       500.    ;# blocks for PLAS swap file
                                 ;
                                 ;  Number of shared global PLAS regions that can be created by all jobs.
                                 ;
        000014                   NGR     =       12.     ;Number of global PLAS regions
                                 ;
                                 ;  BUSTYP defines the machine bus structure for TSX-Plus.  Their are two
                                 ;  possible machine bus structures supported by TSX-Plus - the QBUS (LSI)
                                 ;  and the UNIBUS.  Select one of these parameters below to specify the
                                 ;  bus support desired.  Use the following information for choosing the
                                 ;  correct bus structure.
                                 ;
                                 ;  QBUS   - 11/23, 11/23-Plus, 11/73, and Professional.
                                 ;  UNIBUS - 11/24, 11/34a, 11/44, and 11/60.
                                 ;
        000001                   BUSTYP  =       QBUS    ;Specify machine bus structure (UNIBUS/QBUS)
                                 ;
                                 ;  Memory upper limit size specification expressed in number of k-bytes.
                                 ;  This parameter controls the maximum memory available for TSX-Plus
                                 ;  system use.  Memory above this upper limit will not be used by the
                                 ;  operating system.
                                 ;  If the MEMSIZ parameter is set to 0 (zero), TSX-Plus will use all
                                 ;  available memory on the machine.  To disable the use of extended
                                 ;  memory, set MEMSIZ to 248 or less.
                                 ;
        000000                   MEMSIZ  =       0.      ;Upper memory limit
                                 ;
                                 ;  The INIABT parameter controls the action taken by TSX-Plus when
                                 ;  certain errors are detected during system initialization.
                                 ;  If INIABT=0, TSX-Plus ignores the error and continues running.
                                 ;  If INIABT=1, TSX-Plus aborts initialization and prints an error message.
                                 ;
                                 ;  ************************************************
                                 ;  **  The normal and recommended setting for     **
                                 ;  **  this parameter is INIABT=1. It is cleared  **
```

```
                        ;  **  for default installation.                  **
                        ;  ************************************************
                        ;
                        ;  The following initialization errors are controlled by the INIABT flag:
                        ;    1. A device that was specified in TSGEN does not have a
                        ;       TSX-Plus handler on the system disk.
                        ;    2. A time sharing line that was generated into TSX-Plus is not
                        ;       installed on the machine.
                        ;    3. A shared run-time system file could not be found during startup.
                        ;
000000                  INIABT  =       0       ;0==>Continue on error, 1==>Abort on error
                        ;
                        ;  The UXIFLG parameter controls the action taken by TSX-Plus when
                        ;  an interrupt occurs at an unexpected location. Unexpected interrupts
                        ;  may occur if the interrupt vector address specified in a device
                        ;  handler does not match the actual interrupt address for which the
                        ;  device has been set. Unexpected interrupts can also occur if real-time
                        ;  interrupts occur and no connection has been established between the
                        ;  real-time interrupt and a TSX-Plus real-time program.
                        ;
                        ;  If UXIFLG is set to 1 (one) then unexpected interrupts cause a system
                        ;  crash with the error message:
                        ;       ?TSX-F-UEI-Interrupt occurred at unexpected location
                        ;       Argument value = xxxx
                        ;  Where "xxxx" is the address at which the interrupt occurred.
                        ;
                        ;  If UXIFLG is set to 0 (zero) then unexpected interrupts are ignored
                        ;  by the system and do not cause a crash or print an error message.
                        ;
                        ;  The recommended setting for UXIFLG is 1 (one).
                        ;
000000                  UXIFLG  =       0       ;Unexpected interrupt control flag
                        ;
                        ;  Parameters related to the TSX-Plus system crash dump facility.
                        ;  This optional facility will print some useful internal system
                        ;  data if a system crash occurs.  The dump information can be printed
                        ;  on any terminal connected to a DL-11 type line (including DLV-11)
                        ;  or on a parallel printer port.
                        ;  It is recommended that this facility not be included in the system
                        ;  unless you are experiencing system crashes.
                        ;
                        ;  Set SYSDMP to 1 if you want the crash dump facility, 0 if not.
                        ;
000000                  SYSDMP  =       0       ;1==>Enable crash dump, 0==>No crash dump
                        ;
                        ;  Address of transmitter control register for device to which crash
                        ;  dump is to be written.  This must be a DL-11 type device controller
                        ;  or a parallel printer controller.
                        ;  Specify 177564 to dump on the console terminal.
                        ;  Specify 177514 to dump to line printer connected to standard parallel port.
                        ;
177564                  DMPTCR  =       177564  ;Transmitter control reg for dump device
                        ;
                        ;  Set DMPKTP to 1 if you want a system crash to occur any time a trap
                        ;  occurs within the system. Set it to 0 (zero) if you want recoverable
                        ;  traps within the system to abort the job but continue execution of the
                        ;  system.
```

```
                                          ;
        000000                            DMPKTP  =       0       ;1==>Always crash on traps within system
                                          ;
                                          ;  The  IOABT parameter controls the action taken by TSX-Plus when
                                          ;  a job terminates execution.  If IOABT=0, TSX-Plus will wait for
                                          ;  all outstanding I/O pending for the job to complete before the job
                                          ;  is actually terminated.  If IOABT=1, TSX-Plus will call the handler
                                          ;  abort entry point for all outstanding I/O pending for the job.
                                          ;  Note, the "SET IO [NO] ABORT" keyboard command may be used to
                                          ;  change the value of this parameter.
                                          ;
        000001                            IOABT   =       1       ;0==>I/O rundown, 1==>I/O abort
                                          ;
                                          ;  U$CL is a flag that controls whether the User Command Linkage is to
                                          ;  be used to allow users to define their own commands.
                                          ;  If U$CL is non-zero the UCL facility is enabled and users may define
                                          ;  their own system commands. If U$CL is zero, user defined commands
                                          ;  will not be supported by the system. Note: if the UCL facility is
                                          ;  enabled, the TSXUCL.SAV file must be placed on the system disk.
                                          ;
        000001                            U$CL    =       1       ;0==>No UCL program, 1==>UCL program
                                          ;
                                          ;  Number of user-defined commands that can be stored by TSXUCL
                                          ;  for each job. (The number of blocks required in the SY:TSXUCL.DAT file
                                          ;  is approximately equal to the number of commands per job times the
                                          ;  total number of time-sharing lines divided by 5).
                                          ;
        000024                            UCLMNC  =       20.     ;Maximum user-defined commands per job
                                          ;
                                          ;  The UCLORD parameter selects the default call order for checking
                                          ;  to see if a command is a user-defined command.
                                          ;  FIRST  ==> Check for user-defined commands before system commands.
                                          ;  MIDDLE ==> Check after system commands but before command files.
                                          ;  LAST   ==> Check after system commands and command files.
                                          ;
                                          ;  Note that the SET UCL FIRST/LAST keyboard command can be used to
                                          ;  alter this order on a line-by-line basis.
                                          ;
        000002                            UCLORD  =       MIDDLE  ;Select FIRST / MIDDLE / LAST
                                          ;
                                          ;  The LDSYS flag controls whether the standard system support for
                                          ;  logical disks (LD) is to be provided.
                                          ;  If LDSYS is set to 1, system support for logical disks is included.
                                          ;  If LDSYS is set to 0, system support for logical disks is excluded.
                                          ;
        000001                            LDSYS   =       1       ;1==>Include LD support, 0==>Exclude LD.
                                          ;
                                          ;  The SLEDIT flag controls whether the Single Line Editor (SL) facility
                                          ;  is to be made available to the system.
                                          ;  If SLEDIT is set to 1, Single Line Editor support is included.
                                          ;  If SLEDIT is set to 0, Single Line Editor support is omitted.
                                          ;  Single Line Editor support adds approximately 2Kb to the size of the
                                          ;  mapped portion of the system.
                                          ;
        000001                            SLEDIT  =       1       ;1==>Include SL support, 0==>Exclude SL
                                          ;
                                          ;  The KEYMAX parameter specifies the number of user-defined keys supported
```

```
                                ;  by the single line editor.  The DEFINE/KEY command is used to associate
                                ;  a user-specified text string with a function key.  The maximum number
                                ;  of such key definitions that may be in effect at one time for each user
                                ;  is controlled by the KEYMAX parameter.
                                ;  The maximum supported value for KEYMAX is 60.
                                ;
        000007                  KEYMAX  =       7.      ;Maximum number of user-defined keys for SL
                                ;
                                ;  The MAXWIN parameter specifies the maximum number of terminal display
                                ;  windows that may be in use by all jobs on the system.
                                ;  If MAXWIN is set to 0 (zero), the display window feature is not included
                                ;  in the system.  Display windows are useful if you frequently utilize
                                ;  subprocesses in that they preserve the screen context when you switch
                                ;  between processes.
                                ;
        000012                  MAXWIN  =       10.     ;Total number of display windows for all jobs
                                ;
                                ;  Set DBGFLG to 1 to cause the TSX-Plus program debugging facility
                                ;  to be included with the system.
                                ;  Set DBGFLG to 0 if the debugging facility is not wanted.
                                ;
        000000                  DBGFLG  =       0       ;1==>Include debugger; 0==>Exclude debugger
                                ;
                                ;  Number of slots in INSTALL table to reserve for user programs.
                                ;
        000004                  NUIP    =       4.      ;Number of INSTALL slots for user programs
                                ;
                                ;  The following time-slice values are used to schedule jobs for execution.
                                ;  Each time value must be specified in 0.1 second units.
                                ;
                                ;  QUAN0 -- Time slice for round-robin scheduling of high-priority
                                ;           real-time jobs. That is, jobs with execution priorities
                                ;           greater than or equal to PRIHI.
                                ;
        000002                  QUAN0   =       2.      ;Time slice for real-time jobs
                                ;
                                ;  QUAN1 -- Time that jobs will remain in a high-priority state after
                                ;           they receive an activation character from the terminal.
                                ;           A job is classified as "interactive" from the time when an
                                ;           activation character is received until the job consumes
                                ;           QUAN1 units of time, then the job is classified as "compute
                                ;           bound".
                                ;
        000024                  QUAN1   =       20.     ;High-priority time for interactive jobs
                                ;
                                ;  QUAN1A -- Time that jobs will remain in a high-priority state after
                                ;            they are activated because of I/O completion or they are
                                ;            restarted following other wait states.
                                ;
        000002                  QUAN1A  =       2.      ;High-priority time for wait-reactivation
                                ;
                                ;  QUAN1B -- Time slice used to switch between "interactive" jobs.
                                ;
        000002                  QUAN1B  =       2.      ;Time slice for "interactive" jobs.
                                ;
                                ;  QUAN1C -- Time job will be allowed to stay in highest execution state
                                ;            after receipt of a character from the terminal.
```

```
                                        ;
        000001                          QUAN1C  =       1.      ;Time at highest execution state
                                        ;
                                        ;  QUAN2 -- Time that normal priority CPU-bound jobs are allowed to run
                                        ;           if there are no high-priority jobs that want to run.
                                        ;           This time-slice controls round-robin scheduling of CPU-bound jobs
                                        ;           with execution priority values in the range (PRILOW+1) to
                                        ;           (PRIHI-1).
                                        ;
        000012                          QUAN2   =       10.     ;Normal-priority CPU-bound job time-slice
                                        ;
                                        ;  QUAN3  -- Time slice for round-robin scheduling of very low priority
                                        ;            jobs. That is, jobs with priorities less than or equal
                                        ;            to PRILOW.
                                        ;
        000024                          QUAN3   =       20.     ;Time slice for very low priority jobs
                                        ;
                                        ;  INTIOC -- Number of consecutive times that a job will be allowed to
                                        ;            perform I/O operations following input of an activation
                                        ;            character from the terminal before the job is classified
                                        ;            as non-interactive.
                                        ;
        000036                          INTIOC  =       30.     ;Number of I/O ops. while "interactive".
                                        ;
                                        ;  HIPRCT -- Number of consecutive times that a job will be given a
                                        ;            high-priority execution boost following wait states such
                                        ;            as I/O wait before the job will be scheduled as a normal
                                        ;            CPU-bound job.
                                        ;
        000050                          HIPRCT  =       40.     ;Number of consecutive high-priority hits
                                        ;
                                        ;  Time that job will be held in memory after being swapped in from disk.
                                        ;  A job is not eligible to be swapped out of memory until CORTIM has
                                        ;  elapsed since it was swapped into memory.  However, the job becomes
                                        ;  immediately eligible to be swapped if it goes into a state where it is
                                        ;  waiting on any resource other than non-terminal I/O.
                                        ;  Specify in 0.1 second units.
                                        ;
        000002                          CORTIM  =       2.      ;Guaranteed memory-residency time
                                        ;
                                        ;  Job priority classes:  There are three groups of job priorities,
                                        ;  the lowest priority group ranges from a job priority 0 up to and
                                        ;  including the priority equal to the PRILOW parameter.  Jobs with
                                        ;  priorities in this range execute with lower priority than all normal
                                        ;  time-sharing jobs.
                                        ;  The second range of priorities is from (PRILOW+1) up to (PRIHI-1).
                                        ;  Jobs in this range are treated as normal time-sharing jobs.
                                        ;  The third range of priorities is from PRIHI up to 127.  These priorities
                                        ;  are for real-time jobs which will take unconditional precedence over
                                        ;  all other jobs.
                                        ;  All priority values must be in the range 0 to 127.
                                        ;
        000023                          PRILOW  =       19.     ;Highest "low priority" value
        000120                          PRIHI   =       80.     ;Lowest "high priority" value
                                        ;
                                        ;  PRIDEF -- Default job priority.
                                        ;
        000062                  PRIDEF  =       50.     ;Default job priority
                                ;
                                ;  PRIVIR -- Amount by which a job's execution priority is reduced
                                ;            when the job is disconnected from the terminal by switching
                                ;            to a subprocess. Note: this only applies to jobs with
                                ;            base priorities in the range (PRILOW+1) to (PRIHI-1).
                                ;
        000012                  PRIVIR  =       10.     ;Disconnect job priority reduction
                                ;
                                ;  Maximum number of subprocesses per primary process.
                                ;
        000003                  MAXSEC  =       3.      ;Max subprocesses per user
                                ;
                                ;  Maximum file size (# blocks) that will be returned in response to
                                ;  a .ENTER request that specifies a file size of 0 blocks.
                                ;
        001750                  MAXFIL  =       1000.   ;Max # blocks for default allocation
                                ;
                                ;  Number of 512 byte blocks to hold in memory in a generalized data cache.
                                ;  If the CACHE parameter is set to 0 (zero), data caching is not performed.
                                ;  Note: The data caching facility adds approximately 2000 bytes to the
                                ;  size of the unmapped portion of the system and 528*CACHE bytes to
                                ;  the mapped portion of the system.
                                ;  The maximum number of blocks that may be held in the cache is 4095. (2MB)
                                ;
        000454                  CACHE   =       300.    ;Number of blocks in data cache
                                ;
                                ;  The following parameters relate to the cache of file directory entries
                                ;  maintained by TSX-Plus.  This cache is used to reduce the number of disk
                                ;  accesses required to do lookups on frequently accessed files.
                                ;  The system disk (SY:) is automatically cached.
                                ;  Other devices are only cached if they are introduced to the system
                                ;  by use of the MOUNT command.
                                ;
                                ;  Maximum number of units that may be cached.
                                ;  This includes all logical disks (LD) and all physical disks for which
                                ;  directory caching is enabled by use of the MOUNT command.
                                ;  (Space required is 18 bytes per unit).
                                ;
        000036                  MAXCSH  =       30.     ;Max # device units whose directories to cache
                                ;
                                ;  Maximum number of file entries to be held in directory cache.
                                ;  (Space required is 18 bytes per entry)
                                ;
        000074                  NMFCSH  =       60.     ;Max # file entries to be cached
                                ;
                                ;  Maximum number of device units that can be allocated to jobs for exclusive
                                ;  use by use of the ALLOCATE command.
                                ;
        000005                  MAXALC  =       5.      ;Max # units that can be allocated
                                ;
                                ;  Maximum number of simultaneous requests by jobs to monitor other jobs.
                                ;
        000005                  MAXMON  =       5.      ;Max # job monitoring requests
                                ;
                                ;  The system password is a global password which must be entered
                                ;  when a line is initiated before the normal logon sequence begins.
                                ;  The use of a system password is optional and may be enabled on a
                                ;  line-by-line basis by specifying the $SYSPS flag with the
                                ;  FLAGS macro within the line definition blocks for the lines
                                ;  for which the password will be required.  If a system password is
                                ;  required for a line, an exclamation point prompt is printed as the
                                ;  first thing when the line is initiated.  The idea is to force the
                                ;  calling person to provide a password before printing the normal
                                ;  logon greeting which identifies the nature and identity of the site.
                                ;
002414                                  SYSPS   <TSX>   ;System password for all lines with $SYSPS
                                ;
                                ;  Amount of time that carrier signal must be lost on dial-up
                                ;  lines before we assume the connection has been broken.
                                ;  This value is also used to time-out lines which ring and
                                ;  do not raise carrier.
                                ;  Specify in 0.5 second units.
                                ;
        000170                  TIMOUT  =       120.    ;Time allowed for lost carrier
                                ;
                                ;  Amount of time that a user may remain connected to a dial-up line
                                ;  after logging off before Data Terminal Ready (DTR) will be
                                ;  dropped causing the phone to hang up.
                                ;  Specify in 0.5 second units.
                                ;
        000074                  OFFTIM  =       60.     ;Time allowed for job to be logged off
                                ;
                                ;  Modem lines ($PHONE in the LINDEF FLAGS macro) are normally
                                ;  treated as phone lines if the DCD signal (carrier) is present
                                ;  when the lines are started and optionally treated as local lines
                                ;  if the signal is not present. The OFFTIM and TIMOUT parameters
                                ;  are only effective if the line is recognized as a phone line when
                                ;  started. Set PHONE to 0 to allow lines with the $PHONE
                                ;  flag to optionally support local lines. Set PHONE to 1 to
                                ;  force the OFFTIM and TIMOUT parameters to always take effect for
                                ;  lines with the $PHONE flag.
                                ;
        000000                  PHONE   =       0.      ;$PHONE lines may be local if carrier absent
                                ;
                                ;  Define Lead-in character that tells TSX-Plus that a special
                                ;  terminal control sequence is coming from the program.
                                ;
        000035                  TSLICH  =       035     ;Octal 35 = decimal 29.
                                ;
                                ;  Define the keyboard control character that will be used to
                                ;  switch to a subprocess.
                                ;  (Specify the octal value of the ASCII control character)
                                ;
        000027                  VLSWCH  =       027     ;Octal 27 = control-W
                                ;
                                ;  Define keyboard control character used to cause the current screen
                                ;  window contents to be printed.
                                ;  (Specify the octal value of the ASCII control character)
                                ;
        000002                  PWCH    =       002     ;Octal 02 = control-B
                                ;
                                ;  Define keyboard control character that is used to terminate
                                ;  a cross-connection between a time-sharing line and a CL line.
                                ;  (Specify the octal value of the ASCII control character)
                                ;
        000034                  CCXTRM  =       034     ;Octal 34 = control-\ (control backslash)
                                ;
                                ;  Define keyboard control character that is used to signal
                                ;  special control functions for a time-sharing line cross-connected
                                ;  to a CL line.
                                ;  (Specify the octal value of the ASCII control character)
                                ;
        000001                  CCXCTL  =       001     ;Octal 001 = control-A
                                ;
                                ;  Define the version number to be associated with the CL handler when
                                ;  being used with VTCOM.  If CLVRSN is defined as 0 then an appropraite
                                ;  value will be selected via an internal table.  Zero is the suggested
                                ;  setting.
                                ;
        000000                  CLVRSN  =       0.      ;CL version number
                                ;
                                ;  Define maximum number of user defined activation characters
                                ;  that each line may define during execution.
                                ;
        000020                  MXSPAC  =       16.     ;Max # user defined activation chars per job
                                ;
                                ;  Define maximum number of characters that can be translated by
                                ;  the terminal handler.  This translation consists of replacing
                                ;  a received character by a substitution character on input and replacing
                                ;  the substitution character by the original character on output.
                                ;  This parameter must be non-zero to use the SET TT TRANSLATE=( ) command.
                                ;
        000005                  MXTTCT  =       5.      ;Max # chars that terminal handler can translate
                                ;
                                ;  Select default system editor.
                                ;  The choices are
                                ;   EDIT
                                ;   TECO
                                ;   KED
                                ;   K52
                                ;
        000003                  EDITOR  =       KED     ;Default system editor
                                ;
                                ;  Select system default implicit or explicit wildcards for CCL commands.
                                ;    If WILDFL = 0 then explicit wildcards are selected.
                                ;    If WILDFL = 1 then implicit wildcards are selected.
                                ;
        000001                  WILDFL  =       1       ;1==>Implicit wildcard, 0==>Explicit wildcard
                                ;
                                ;-----------------------------------------------------------------------
                                ;  The DEVDEF macro must be used to define the names and characteristics
                                ;  of all devices which are to be available to TSX-Plus users.
                                ;  The form of a device definition is:
                                ;
                                ;       DEVDEF  <device>[,option,...,option]
                                ;
                                ;  For each device to be available to the system an entry must be made
                                ;  using the DEVDEF macro. This macro requires at least one argument
                                ;  but may have several optional arguments as described below:
                                ;
                                ;  1.  The first parameter is the two character device name enclosed
                                ;      in angle brackets.
                                ;  2.  The optional parameters specify the device characteristics.
                                ;      There are nine allowable device attributes which may be
                                ;      specified in any order.  They are as follows:
                                ;
                                ;      DMA      Device performs Direct Memory Access (DMA).
                                ;      MAPIO    Perform I/O mapping (18-bit controllers on 22-bit QBUS).
                                ;      EVNBUF   Require even byte buffer address for I/O transfers.
                                ;      NOCACHE  Do not use generalized data cache for this device.
                                ;      NOMOUNT  Do not allow mounts (i.e., use directory cache) for
                                ;               this device.
                                ;      REQALC   Require device allocation before use.
                                ;      MAPH     Load the device handler outside the low memory 40K
                                ;               byte region and into a mapped handler region.
                                ;      NOMAPH   Do not load the handler into a mapped handler region
                                ;               instead load it into the low memory 40k byte region.
                                ;      HANBUF   Handler contains an internal I/O buffer.
                                ;
                                ;  For standard device drivers, it is important to choose MAPIO when
                                ;  18-bit controllers or handlers will be used on a 22-bit LSI system.
                                ;  It is not necessary to specify other device attributes for standard
                                ;  TSX-Plus supplied device drivers since TSX-Plus will automatically
                                ;  make default selections.
                                ;
                                ;       ************************************
                                ;       **  When performing a TSX-Plus     **
                                ;       **  system generation, remove the  **
                                ;       **  devices in this list which are **
                                ;       **  not present on your system,    **
                                ;       **  and include those which are.   **
                                ;       ************************************
                                ;
 002442                                 DEVBEG          ;Beginning of device definitions
 002442                                 DEVDEF  <DW>    ;Pro hard disk
 002442                                 DEVDEF  <DZ>    ;Pro floppy disk
 002442                                 DEVDEF  <NL>    ;NULL handler
 002442                                 DEVDEF  <ZZ>,MAPH       ;DBL security handler
 002442                                 DEVEND          ;End of device definitions

                                ;--------------------------------------------------------------------
                                ;  Parameters related to system I/O buffers used when DMA devices
                                ;  with 18-bit controllers are used on Q-bus systems with
                                ;  22-bit addressing (e.g., 11/23-Plus and 11/73).
                                ;
                                ;  Number of system buffers allocated for I/O buffering.
                                ;  (The recommended number is one per active device that requires buffering.)
                                ;
         000000                 MIONBF  =       0.      ;Number of system I/O buffers
                                ;
                                ;  Size of each system I/O buffer, in units of 512 bytes.
                                ;  The maximum allowed value for this parameter is 15.
                                ;
         000017                 MIOBSZ  =       15.     ;I/O buffer size in units of 512 bytes

                                ;--------------------------------------------------------------------
                                ;  Some device handlers allocate extended memory (PLAS) regions for
```

```
                                 ;  their use.  For example, the DU and MU handlers each require one
                                 ;  PLAS region. If you are using any other handlers which require
                                 ;  extended memory regions, include the number of regions required.
                                 ;
          000004                 DEVXMR  =       4.      ;Number of XM regions for device handlers

                                 ;-----------------------------------------------------------------
                                 ;  Define those devices which are to be spooled by TSX-Plus
                                 ;  (such as line printers).
                                 ;  There are seven arguments to the SPOOL macro:
                                 ;    1. Number of devices to be spooled (may be zero).
                                 ;    2. Number of spool files which may be open by all users.
                                 ;    3. Number of spool buffers (512. bytes each).
                                 ;    4. Number of blocks in spool disk file.
                                 ;    5. List of 3 character names of devices to be spooled.
                                 ;    6. Specify 0 if spool files are to be eligible to be
                                 ;       started as soon as they are created,
                                 ;       specify 1 if they are to be held until the channel
                                 ;       is closed.  Note: The "SPOOL xx,[NO]HOLD" keyboard
                                 ;       command can override this parameter.
                                 ;    7. Number of blocks which are to be backed up
                                 ;       when the "SPOOL xx,BACK" command is given.
                                 ;
                                 ;  Note: The SPOOL macro must be present even if
                                 ;  there are no spooled devices.  However, if the first
                                 ;  argument (number of spooled devices) is zero, no spool
                                 ;  tables are generated and arguments 2-7 are ignored.
                                 ;
002442                                   SPOOL   2,30.,3,250.,<CL2CL3>,0,5.

                                 ;-------------------------------------------------------------
                                 ;  Define parameters pertaining to record (block) locking
                                 ;  for shared files.  If the shared file block locking
                                 ;  facility is not wanted, set all of these parameters to
                                 ;  0 (zero).
                                 ;
                                 ;  Maximum number of shared files which may be open
                                 ;  simultaneously.  Note that several users accessing the same
                                 ;  file count as 1.
                                 ;
          000062                 MAXSF   =       50.     ;Max number of shared files
                                 ;
                                 ;  Maximum number of I/O channels which all users may
                                 ;  simultaneously have open to shared files.
                                 ;  Note, this is the total number for all users not
                                 ;  for each user.
                                 ;
          000144                 MAXSFC  =       100.    ;Max # shared file channels
                                 ;
                                 ;  Maximum number of blocks which may be simultaneously
                                 ;  held locked by any channel.  That is, max blocks
                                 ;  locked per channel.
                                 ;
          000003                 MXLBLK  =       3.      ;Max blocks locked per channel
                                 ;
                                 ;  Number of 512-byte blocks to be held in the in-memory data
                                 ;  cache for shared files.
```

```
                        ;  (Note that the MAXSF, MAXSFC, and MXLBLK parameters must be
                        ;  non-zero to enable shared file data caching.)
                        ;
000000                  NUMDC   =       0.      ;Number of blocks in shared file data cache
                        ;
                        ;----------------------------------------------------------------
                        ;  Define parameters pertaining to the inter-program
                        ;  message communication feature.  If this feature is
                        ;  not wanted, set all four parameters to 0 (zero).
                        ;
                        ;  Maximum number of message communication channels
                        ;  which may be simultaneously in use.
                        ;
000005                  MAXMC   =       5.      ;Max message channels
                        ;
                        ;  Maximum message length (bytes).
                        ;
000310                  MSCHRS  =       200.    ;Max message length (bytes)
                        ;
                        ;  Maximum number of messages which may be held in queue.
                        ;
000006                  MAXMSG  =       6.      ;Max queued messages
                        ;
                        ;  Maximum number of requests for messages that may be held in queue
                        ;
000005                  MAXMRB  =       5.      ;Max # pending message requests

                        ;-----------------------------------------------------------------------------
                        ;  The RTVECT parameter specifies the number of real-time interrupt vectors
                        ;  that can be connected to TSX-Plus jobs.  Set RTVECT to the maximum number
                        ;  of interrupt vectors that all running real-time programs may be connected
                        ;  to at the same time.
                        ;  (Note: The basic real-time support facility is now a standard part of
                        ;  TSX-Plus and it is no longer necessary to set RTVECT to 1 to include
                        ;  real-time facilities such as locking a job in memory or accessing the
                        ;  I/O page.  It is also no longer necessary to set RTVECT to 1 to allow
                        ;  use of the SYSMON program. RTVECT should be set to 0 (zero) unless some
                        ;  real-time interrupts are going to be connected to TSX-Plus jobs.)
                        ;
000000                  RTVECT  =       0.      ;Max # interrupt vectors that may be connected

                        ;-------------------------------------------------------------------------
                        ;  Define the size of the table within TSX-Plus used to hold information
                        ;  when the performance monitoring feature is being used.
                        ;  Each word in this table corresponds to one cell in the histogram.
                        ;  Specify the size as number of bytes for the table.
                        ;  (Note: The maximum allowed size is 8192 bytes)
                        ;
000000                  PMSIZE  =       0.      ;Size of performance monitor table (bytes)

                        ;-----------------------------------------------------------------------------
                        ;  Use the RTDEF macro at this point to specify information about
                        ;  any shared run-time systems to be loaded when TSX-Plus is started.
                        ;
                        ;  The form of the RTDEF macro is
                        ;       RTDEF   <name>,r-flag,skip-count
                        ;
```

```
                                        ;  Where
                                        ; - Name is the 12 character name of the file containing the run-time system
                                        ;   which must be specified in the form DevFilnamExt -- that is, three
                                        ;   character device name, six character file name and three character
                                        ;   extension.
                                        ; - R-flag is either R if user programs are to have read-only access to
                                        ;   the run-time system, or RW if read-write access is to be granted.
                                        ; - Skip-count is the number of blocks to be skipped over at the front
                                        ;   of the file when loading it.
                                        ;
                                        ;  Example:
                                        ;       RTDEF   <SY CBR063SHR>,R,1.     ;COBOL-Plus shared run-time
                                        ;       RTDEF   <SY DBLSHRRTS>,R,1.     ;DBL shared run-time
                                        ;       RTDEF   <SY DB4RTSSHR>,R,0.     ;DBL V4 shared run-time
                                        ;
```

```
                        ;---------------------------------------------------------------------
                        ;  Time-sharing line parameters:
                        ;
                        ;  Default input and output character buffer sizes.
                        ;  These buffer sizes will be used for lines that don't use
                        ;  the BUFSIZ macro within their line definitions to declare
                        ;  their character buffer sizes.
                        ;  These buffer sizes are also used for all subprocesses.
                        ;
        000276          DINSPC  =       190.    ;Default input char buffer size
        000360          DOTSPC  =       240.    ;Default output char buffer size
                        ;
                        ;  When the terminal-output character buffer is filled a job is suspended.
                        ;  The job is restarted after characters are printed from the buffer and
                        ;  there are OTRASZ characters remaining in the buffer.
                        ;
        000031          OTRASZ  =       25.     ;Reactivation character count
                        ;
                        ;  A software character "silo" is used to hold characters received
                        ;  from time-sharing lines until they can be processed by the system.
                        ;  The silo is used to prevent the loss of characters during high
                        ;  speed input.  Each time-sharing line and CL line has its own silo.
                        ;  If the input to the line is coming from a terminal, the silo can be
                        ;  quite small.  On the other hand, if the input is coming from another
                        ;  computer or other high speed device, the silo size should be increased.
                        ;  The NCSILO, NCXOFF, and NCXON parameters set default values pertaining
                        ;  to the silos.  The SILO macro can be used within a line definition
                        ;  to specify silo parameters for a specific line.
                        ;
                        ;  Default size of input character silos.
                        ;
        000062          NCSILO  =       50.     ;Default silo size
                        ;
                        ;  The system will transmit a control-S (XOFF) character when an input
                        ;  silo is filled to the point where there are only NCXOFF free
                        ;  character positions remaining.
                        ;
        000014          NCXOFF  =       12.     ;Default XOFF point for silos
                        ;
                        ;  If the system sends an XOFF because a silo becomes nearly full,
                        ;  it will send an XON to restart transmission when there are only
                        ;  NCXON characters remaining in the silo.
                        ;
        000004          NCXON   =       4.      ;Default XON point for silos
                        ;
                        ;  Number of "extra" CL (communication line) units to be genned into
                        ;  system.  These CL units are not initially assigned to any line but
                        ;  may be used "take over" a time-sharing line to use it as a CL unit.
                        ;  The total number of CL units (those defined using CLDEF blocks plus
                        ;  the extra units) may not exceed 16. The first 8 CL units are
                        ;  named CL0 to CL7, the second 8 are named C10 through C17.
                        ;
        000004          CLXTRA  =       4.      ;Number of extra CL units.
                        ;
                        ;  Default output ring buffer size for I/O communication lines defined
                        ;  with the CLDEF macro and accessed as "CL" devices.
                        ;  The recommended value is ((3*baud_rate)/1000+2).
```

```
                                ;
        000040                  CLORSZ  =       32.     ;Size of CL output ring buffers
                                ;
                                ;-------------------------------------------------------------------------
                                ;  Flags which can be used with the FLAGS macro within
                                ;  a line definition block to define line characteristics.
                                ;
        100000                  $SCOPE  =       100000  ;ON==>CRT type terminal
        040000                  $ECHO   =       40000   ;ON==>Echo characters to terminal
        020000                  $TAPE   =       20000   ;ON==>"Paper-tape" mode (do x-on/x-off control, etc.)
        010000                  $8BIT   =       10000   ;ON==>Support 8 bit (rather than 7 bit) characters.
        004000                  $START  =       4000    ;ON==>Automatically start line during initialization
        001000                  $TAB    =       1000    ;ON==>Do not simulate tabs (Terminal handles tab char)
        000400                  $FORM   =       400     ;ON==>Do not simulate form-feeds (Terminal handles FF)
        000200                  $AUTO   =       200     ;ON==>Do autobaud speed selection for line
        000100                  $PAGE   =       100     ;ON==>Enable ctrl-S/ctrl-Q input processing
        000040                  $LC     =       40      ;ON==>Enable lower-case input
        000020                  $NOSUB  =       20      ;ON==>Disallow use of subprocesses
        000010                  $DEFER  =       10      ;ON==>Do defered character echoing (recommended)
        000004                  $QTSET  =       4       ;ON==>Set tt quiet (Don't list command files)
        000002                  $SYSPS  =       2       ;ON==>Require system password before logon
        000001                  $PHONE  =       1       ;ON==>Dial-up, modem connected line
                                ;
                                ;  Default line flags that will be used for each line that does
                                ;  not explicitly specify flags using a FLAGS macro.
                                ;
        040150                  NRMFLG  =       $ECHO!$DEFER!$PAGE!$LC
                                ;
                                ;--------------------------------------------------------------------
                                ;  Terminal type names that are legal to used with the TRMTYP macro
                                ;  within a line definition block to define the terminal type.
                                ;
                                ;  VT100 ==> DEC VT100
                                ;  VT200 ==> DEC VT200 with 7 bit control codes
                                ;  VT52  ==> DEC VT52
                                ;  LA36  ==> DEC LA36
                                ;  LA120 ==> DEC LA120
                                ;  HAZEL ==> Hazeltine brand terminals
                                ;  ADM3A ==> Lear Siegler ADM3A
                                ;  DIABLO==> Diablo brand terminals (with X-ON/X-OFF protocol)
                                ;  QUME  ==> Qume brand terminals (with X-ON/X-OFF protocol)
                                ;
```

```
                ;-------------------------------------------------------------
                ;  Line definitions
                ;
                ;  The TBLDEF macro call requires four arguments:
                ;    1. The number of real (physical) time-sharing lines on machine.
                ;    2. The number of subprocess jobs.
                ;    3. The number of detached jobs.
                ;    4. The number of dedicated CL lines.
                ;
002656                  TBLDEF  7.,3.,2.,0.     ;# Real, # Subprocess, # Detached, # CL lines
                ;
                ;  Define primary (real) time-sharing lines
                ;
010006                  LINDEF  60,177560,OPER  ;Use console terminal as t/s term
010006                  NAME    <Console>
010006                  CMDFIL  LINE1.TSX
010006                  TRMTYP  VT100
010006                  FLAGS   NRMFLG!$START!$SCOPE!$TAB
010006                  LINEND

010026                  LINDEF  220,173400      ;Printer port
010026                  NAME    <Printer port>
010026                  FLAGS   NRMFLG!$AUTO
010026                  CMDFIL  LINE2.TSX
010026                  TRMTYP  VT100
010026                  LINEND

010046                  LINDEF  210,173300      ;Communications port
010046                  NAME    <Com. port>
010046                  FLAGS   NRMFLG!$AUTO!$PHONE
010046                  CMDFIL  LINE3.TSX
010046                  TRMTYP  VT100
010046                  LINEND
                ;
                ;  Define lines on Pro quad serial line unit
                ;
010066                  MUXDEF  300,160000      ;Quad serial line unit
                ;
                ;  Line 0 on quad serial line unit
                ;
010066                  LINDEF  0
010066                  NAME    <QSL 0>
010066                  TRMTYP  VT100
010066                  CMDFIL  LINE3.TSX
010066                  FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010066                  LINEND
                ;
                ;  Line 1 on quad serial line unit
                ;
010106                  LINDEF  1
010106                  NAME    <QSL 1>
010106                  TRMTYP  VT100
010106                  CMDFIL  LINE3.TSX
010106                  FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010106                  LINEND
                ;
                ;  Line 2 on quad serial line unit
```

```
                        ;
010126                          LINDEF  2
010126                          NAME    <QSL 2>
010126                          TRMTYP  VT100
010126                          CMDFIL  LINE3.TSX
010126                          FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010126                          LINEND
                        ;
                        ;  Line 3 on quad serial line unit
                        ;
010146                          LINDEF  3
010146                          NAME    <QSL 3>
010146                          TRMTYP  VT100
010146                          CMDFIL  LINE3.TSX
010146                          FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010146                          LINEND
                        ;
010166                          MUXEND
                        ;
                        ;;
                        ;  Use the "DETACH" macro here to declare any start-up command
                        ;  files to be run as detached jobs.
                        ;
010166                          DETACH  SY:DET1.TSX     ;Start-up detach job command file
010310                          DETACH  SY:DET2.TSX     ;Start-up detach job command file
                        ;
                        ;=================================================================
                        ;  END OF SECTION OF TSGEN TO BE ALTERED BY USER
                        ;=================================================================
      3                                  .LIST   MD
      4                                  .LIST   CND
      5                                  .ENDC
```

```
                ;-------------------------------------------------
                ;  Finish building tables
                ;
                ;  Make sure memory size parameters are reasonable.
                ;
                .IF     GT,HIMEM-64.
                .ERROR  ;HIMEM may not exceed 64.
                HIMEM   =       64.
                        .ENDC
                .IF     GT,DFLMEM-HIMEM
                DFLMEM  =       HIMEM
                        .ENDC
                ;
                ;  Make sure silo parameters are reasonable
                ;  Actual silo limit is specified by MAXSLO
                ;
                        .IIF    GT,<NCSILO-255.> NCSILO = 255.
000027          S = <NCSILO/2>-2
                        .IIF    GT,<NCXOFF-S>   NCXOFF = S
000014          NCXOFF  = NCXOFF&377    ;MUST BE BYTE SIZE
                        .IIF    GT,<NCXON-S>    NCXON  = S
000004          NCXON   = NCXON&377     ;MUST BE BYTE SIZE
                ;
                ;  Make sure last line definitions were properly terminated
                ;
                        .IF     NE BO
                .ERROR  1 ; Missing LINEND for last line
                        LINEND
                        .ENDC
                        .IF     NE CURMX
                .ERROR  1 ; Missing MUXEND
                        MUXEND
                        .ENDC
                ;
                ;  Make sure the right # of lines were defined.
                ;
                        .IF     NE <NPLDF-NPL>
                .ERROR  2; Wrong number of primary lines defined
                        .ENDC
                        .IF     NE <NCLDF-NIOL>
                .ERROR  2; Wrong number of CL lines defined
                        .ENDC
                        .IF     GT <NDLDF-NDL>
                .ERROR  2; Wrong number of detached jobs defined
                        .ENDC
                ;
                ;  Define any additional detached job lines.
                ;
000000                  .REPT   <NPL+NDL-LN>
                        DETACH
                        .ENDR
                        .IF     NE <LN-NPL-NDL>
                .ERROR  2 ; Wrong number of lines defined
                        .ENDC
                        .IF     NE <NCLDF-NIOL>
                .ERROR  2; Wrong number of CL lines defined
                        .ENDC
                        ;
                        ;  Define tables for subprocesses (if any)
                        ;
                                .IF     NE NSL
       000003                   .REPT   NSL
                        BO      =       1               ;BEGIN BLOCK
                        LN      =       LN+1
                        LX      =       LX+2
                        CLX     =       LX
                                BUFSIZ  DINSPC,DOTSPC
                                LINEND
                                .ENDR
                                .ENDC
010432                          .CSECT  TSGEN
                        ;
                        ;  Define mux interrupt entry vectors
                        ;
                        ;  Input interrupt entry points
       000001                   .REPT   LSTMX/2
                                INCB    MUXNUM
                                .ENDR
010436 000167 000000G   INMXV:  JMP     ININT
                        ;  Output interrupt entry points (set up by TSINIT)
010442                  OTMXV:  .BLKW   3*<LSTMX/2>
                        ;
                        ;  Generate tables for Unibus map registers
                        ;
                                .GLOBL  UMRBAS,UMREND,UMRWHD
010450 000000           UMRWHD: .WORD   0
                                .MACRO  UMRDEF  NUM
                                .BYTE   CURUMR                  ;UM$UMR
                                .BYTE   NUM                     ;UM$NMR
                                .WORD   NUM*4096.               ;UM$WDS
                                .WORD   0                       ;UM$IOQ
                        CURUMR  =       CURUMR+NUM
                                .ENDM   UMRDEF
                        ;  Define UMR sets in order of size -- small to large.
       000005           CURUMR  =       5               ;Map regs 0-4 always mapped by init code.
010452                  UMRBAS:
                                .IF     EQ,<BUSTYP-UNIBUS>      ;Generate only for UNIBUS machines
                                UMRDEF  1.
                                UMRDEF  1.
                                UMRDEF  4.
                                UMRDEF  4.
                                UMRDEF  8.
                                UMRDEF  8.
                                .ENDC
010452                  UMREND:
                        ;
                        ;  Check file and device caching parameters
                        ;
                                .IF     LT,<MAXCSH-1>           ;MAKE SURE WE CACHE AT LEAST 1 DEVICE
                        MAXCSH  =       1
                                .ENDC
                                .IF     LT,<NMFCSH-4>           ;MINIMUM NUMBER OF CASHED FILES
                        NMFCSH  =       4
                                .ENDC
```

```
    115                                     ;
    116                                     ;  Generate tables to keep track of allocated devices
    117                                     ;
    118                                             .IF     LT <MAXALC-1>           ;Make sure we have at least 1 entry
    119                                     MAXALC  =       1
    120                                             .ENDC
    121 010452                              ALCTBL:                                 ;Base of device allocation table
    122         000005                              .REPT   MAXALC
    123                                             .WORD   0                       ;AD$DVU
    124                                             .BYTE   0                       ;AD$JOB
    125                                             .BYTE   0                       ;AD$FLG
    126                                             .ENDR
    127 010476                              ALCEND:                                 ;End of device allocaton table
    128                                     ;
    129                                     ;  Check validity of PMSIZE
    130                                     ;
    131                                             .IF     GT <PMSIZE-8192.> ;PMSIZE MAY NOT EXCEED 8192.
    132                                     .ERROR 0;PMSIZE may not exceed 8192.
    133                                     PMSIZE  =       8192.
    134                                             .ENDC
    135                                     ;
    136                                     ;  Check validity of MIOBSZ
    137                                     ;
    138                                             .IF     GT <MIOBSZ-15.>
    139                                     .ERROR 0;MIOBSZ may not exceed 15.
    140                                     MIOBSZ  =       15.
    141                                             .ENDC
    142                                     ;
    143                                     ;  Check validity of CACHE parameter
    144                                     ;
    145                                             .IF     GT <CACHE-4095.>
    146                                     CACHE   =       4095.
    147                                             .ENDC
```

```
                        ;----------------------------------------------------
                        ;  Generate tables for shared file i/o control
                        ;
                                .IF     NE,MAXSF        ;ANY SHARED FILES?
                        ;**
                        ;**  Assemble if there are shared files **
                        ;**
                                .IFF
                        ;**
                        ;**  Assemble this code if there are no shared files **
                        ;**
                        MAXSFC  =       0
                        MXLBLK  =       0
                        NUMDC   =       0
                        ;
                                .ENDC
                        ;
                        ;
                        ;
                        ;----------------------------------------------------------------------------
                        ;  Generate dummy shared run-time definitions
                        ;
        000002                  .REPT   NDRTDF
                                RTDEF   <$$           >,R,0
                                .ENDR
```

```
                       ;-----------------------------------------------------------------------
                       ;  Generate tables for real-time support facility.
                       ;
                       ;  Generate the vector control blocks
                       ;
                               .GLOBL  VCBBAS,VCBEND
010476                 VCBBAS:
          000000               .REPT   RTVECT
                               JSR     R2,@#RTINT
                               .WORD   0,0,0           ;Must match size defined in TSDEFS
                               .ENDR
010476                 VCBEND:
          000020       NUMIOQ  =       NUMIOQ+RTVECT   ;ADD I/O QUEUE ELEMENTS FOR INT COMPL ROUTINES
          000006       NUMSYQ  =       NUMSYQ+RTVECT
                       ;
                               .IF     NE,RTVECT
                       ;**
                       ;**  Assemble this code if real-time support is wanted
                       ;**
                               .GLOBL  RTINT
                               .ENDC           ;End of real-time conditional
                       ;
                       ;-----------------------------------------------------------------------
                       ;  Conditional code for different types of terminals.
                       ;
                               .IF     NE,DHUSE
                       ;**
                       ;**  Assemble this code if DH11 support is needed
                       ;**
                               .IFF
                       ;**
                       ;**  Assemble this code if DH11 support is not needed
                       ;**
                               .GLOBL  TSDHIO,DHSTRT,DHSTOP,DHOINT
                               .GLOBL  VHSTRT,VHOINT,DHTIMR,VHSTOP
                               .GLOBL  DHXON,DHXOFF,VHXOFF,VHXON
          000000       TSDHIO  =       0
010476                 DHTIMR:
010476                 DHSTRT:
010476                 DHSTOP:
010476                 DHXON:
010476                 DHXOFF:
010476                 DHOINT:
010476                 VHSTRT:
010476                 VHSTOP:
010476                 VHXON:
010476                 VHXOFF:
010476                 VHOINT:
010476    000207               RETURN
                               .ENDC           ;End of DH11 conditional code
                       ;
                       ;-----------------------------------------------------------------------
                       ;  Conditional code for CL units
                       ;
                               .GLOBL  CL$OPT,CL$STA,CL$COL,CL$RQH,CL$WQH
                               .GLOBL  CL$ORB,CL$ORA,CL$ORS,CL$ORG,CL$ORP,CL$ORE
                               .GLOBL  CL$LEN,CL$LIN,CL$WID,CL$SKP,CL$LIX
```

```
                                                .GLOBL  CL$EPN,CL$EPS,CL$EPP,CL$XLN,CLSTS
                                        ;
                                        ;  Define CL device status word.  See the RT-11 .DSTATUS or .DRDEF macros
                                        ;  for status bit definitions.  The device type code is the same as XL.
                                        ;  (To make file names appear in SHOW QUEUE for spooled CL device,
                                        ;   add the SPECL$ flag (10000).)
                                        ;
             006057                     CLSTS   = 4000+2000+57          ;HNDLR$+SPFUN$+XL$COD
                                        ;
                                                .IF     NE,CLVRSN       ; Test to see if CLVRSN is defined as 0
                                                .IF     LE,<CLVRSN-14.> ; or greater than 14.
                                                .ERROR 0;Minimum CL version number is 15.   ;If not report an error
                                                CLVRSN  = 15.           ; and set to a reasonable number
                                                .ENDC                   ; End conditional LE,<CLVRSN-14.>
                                                .ENDC                   ; End conditional NE,CLVRSN
                                        ;
                                        ;  Define table that tells which line is associated with each CL unit.
                                        ;  Note, this table is always generated.  Even if there are no CL lines
                                        ;  genned in.
                                        ;
   010500    000000  000000  000000     CL$LIX: .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 ;Line index for each CL unit
   010506    000000  000000  000000
   010514    000000  000000  000000
   010522    000000  000000  000000
   010530    000000  000000  000000
   010536    000000
                                        ;
                                        ;  Macro to define CL tables which have one entry per CL unit
                                        ;
                                                .MACRO  CLTABL NAME
                                        NAME:
                                                .REPT   CLTOTL
                                                .WORD   0
                                                .ENDR
                                                .ENDM   CLTABL
                                        ;
                                                .IF     NE,CLTOTL       ;Assemble if there are CL units
                                        ;**
                                        ;**  Assemble this code if there are CL units
                                        ;**
   010540                                       CLTABL  CL$OPT          ;Option flags (CO$xxx)
   010550                                       CLTABL  CL$STA          ;Status flags (CM$xxx)
   010560                                       CLTABL  CL$COL          ;Current column position
   010570                                       CLTABL  CL$LEN          ;Number of lines per page
   010600                                       CLTABL  CL$LIN          ;Current line number
   010610                                       CLTABL  CL$XLN          ;Number of line CL unit is cross connected to
   010620                                       CLTABL  CL$SKP          ;Number of lines to skip at bottom of page
   010630                                       CLTABL  CL$WID          ;Maximum allowed line width
   010640                                       CLTABL  CL$RQH          ;Internal queue head for read requests
   010650                                       CLTABL  CL$WQH          ;Internal queue head for write requests
   010660                                       CLTABL  CL$ORB          ;Start of output ring buffer
   010670                                       CLTABL  CL$ORE          ;End of output ring buffer
   010700                                       CLTABL  CL$ORP          ;Pointer where next char goes in output ring
   010710                                       CLTABL  CL$ORG          ;Pointer to next char to get from output ring
   010720                                       CLTABL  CL$ORA          ;Allocated size of output ring buffer
   010730                                       CLTABL  CL$ORS          ;Free space in output ring buffer
   010740                                       CLTABL  CL$EPN          ;Number of Form-feeds for end page
```

```
010750                          CLTABL  CL$EPS          ;Pointer to end-of-file string buffer
010760                          CLTABL  CL$EPP          ;Pointer to next char within EOF string buffer
                        ;
                                .IFF                    ;Assemble if no CL units
                        ;**
                        ;**  Assemble this code if there are no CL units
                        ;**
                                .GLOBL  CLOTIR,CLSIZE,CLHEAD,CLLQE,CLCQE,CLINIR,CLABF
                                .GLOBL  TSCLR
                        TSCLR   =       0
                        CLSIZE  =       0
                        CLHEAD  =       0
                        ;
                        CLCQE:
                        CLLQE:
                        CL$OPT:
                        CL$STA:
                        CL$COL:
                        CL$LEN:
                        CL$LIN:
                        CL$XLN:
                        CL$SKP:
                        CL$WID:
                        CL$RQH:
                        CL$WQH:
                        CL$ORB:
                        CL$ORE:
                        CL$ORP:
                        CL$ORQ:
                        CL$ORA:
                        CL$ORS:
                        CL$EPN:
                        CL$EPS:
                        CL$EPP:
                                .WORD   0
                        ;
                        CLINIR:
                        CLOTIR:
                        CLABF:
                                RETURN
                        ;
                                .ENDC                   ;End conditional (NE,CLTOTL)
                        ;
                        ;-----------------------------------------------------------------------
                        ;  Define some misc data cells
                        ;
010770  000012          NMFREQ: .WORD   NUMIOQ-NUMSYQ   ;# I/O queue elements available for user jobs
                        ;
                        ;  Invoke dummy SYSPS if user commented it out
                        ;
                                .IIF    EQ,SYSPSS       SYSPS   <>
                        ;
                        ;  Make sure PHONE parameter is 0 or 1
                        ;
                                .IIF    NE,PHONE        PHONE = 1
                        ;
                        ;  Close out some CSECTS.
```

```
    167                                  ;
    168 000034                                   .CSECT  RDBSEC
    169 000034                           RDBEND:
    170 000240                                   .CSECT  SASECT
    171                                          .EVEN
    172 000000                                   .CSECT  GENTOP
    173 000000  123456                   GENTOP: .WORD   123456          ;Flag word for top of tsgen
    174                                          .IF NE FULLST
    176                                          .LIST   BIN
    177                                          .ENDC ;NE FULLST
    178                                  ;
    179                                  ;  Define address of top of resident portion of TSX-Plus
    180                                  ;
    181 000000                                   .ASECT
    182         000050                   .       =       50
    183 000050  000000G                          .WORD   PROITP
    184         000014                   .       =       14
    185 000014  000000G                          .WORD   SCHED
    186 000016  000000G                          .WORD   DSKBUF
    187                                  ;
    188         000001                           .END
Errors detected:  0

*** Assembler statistics


Work  file  reads: 159
Work  file writes: 138
Size of work file: 21456 Words  ( 84 Pages)
Size of core pool: 17920 Words  ( 70 Pages)
Operating  system: RT-11

Elapsed time: 00:01:14.58
DK:TSGEN,LP:TSGEN=DK:TSGEN.PRO/C/N:SYM
```

```
$8BIT    17-68#
$AUTO    17-72#    18-23     18-30     18-45     18-54     18-63     18-72
$DEFER   17-76#    17-84
$ECHO    17-66#    17-84
$FORM    17-71#
$INDDV    3-103#
$LC      17-74#    17-84
$MEMSZ    1-50      3-100#
$NOSUB   17-75#
$NOVLN    2-34#
$PAGE    17-73#    17-84
$PHONE   17-79#    18-30     18-45     18-54     18-63     18-72
$PRIV     2-33#
$QTSET   17-77#
$SCOPE   17-65#    18-18     18-45     18-54     18-63     18-72
$START   17-69#    18-18
$SYSPS   17-78#
$TAB     17-70#    18-18     18-45     18-54     18-63     18-72
$TAPE    17-67#
$TCFIG    3-102#
ABRTOV    1-126     4-93#
ADM3A     1-133
AHEND     1-89     16-547#
ALCEND    1-86     20-127#
ALCTBL    1-86     20-121#
AUTHAN    1-89     16-542#
BASMAP    1-110     4-325#
BLKEY     1-98      3-60#
BLKMV     1-134     3-223
BMJMP     3-221     3-223#
BO        8-50#    18-14     18-14#    18-19     18-19#    18-21     18-21#    18-26     18-26#    18-28     18-28#    18-33
         18-33#    18-41     18-41#    18-46     18-46#    18-50     18-50#    18-55     18-55#    18-59     18-59#    18-64
         18-64#    18-68     18-68#    18-73     18-73#    18-81     18-82     20-26     20-69     20-69     20-69     20-69#
         20-69#    20-69#    20-69#    20-69#    20-69#
BOTCSR    1-88      4-103#
BOTDEV    1-88      4-101#
BOTUNI    1-88      4-102#
BUSTYP    4-174    16-90#    20-97
C1DEVX    1-105     4-100#
CA$BLK    1-120     4-122#
CA$DVU    1-120     4-123#
CA$HBL    1-120     4-128#
CA$HFL    1-120     4-127#
CA$HSH    1-120     4-129#
CA$UBL    1-120     4-126#
CA$UFL    1-120     4-125#
CA$WCT    1-120     4-124#
CACHE     4-37      4-38     16-363#   20-145
CASCBR    1-122     4-137#
CASCUP    1-122     4-140#
CASTBR    1-122     4-136#
CASTBW    1-122     4-139#
CASTRO    1-122     4-135#
CASTWO    1-122     4-138#
CCBHD     1-121     4-134#
CCLSAV    1-103     4-61#
```

```
CCXCTL   4-190   16-461#
CCXTRM   4-189   16-454#
CDX$DH    1-78     2-76#
CDX$DL    1-78     2-74#    2-92    18-75
CDX$DZ    1-78     2-75#   18-37    18-37
CDX$PC    1-78     2-79#
CDX$PI    1-77     2-78#
CDX$PP    1-78     2-80#
CDX$QP    1-79     2-81#
CDX$VH    1-78     2-77#
CFABLV    1-50     3-90#
CFCHAN    1-69     2-83#
CFSTS     1-50     3-86#   3-209
CHKEY     1-98     3-61#
CL$COL   22-55    22-95#
CL$EPN   22-58   22-109#
CL$EPP   22-58   22-111#
CL$EPS   22-58   22-110#
CL$LEN   22-57    22-96#
CL$LIN   22-57    22-97#
CL$LIX   22-57    22-78#
CL$OPT   22-55    22-93#
CL$ORA   22-56   22-107#
CL$ORB   22-56   22-103#
CL$ORE   22-56   22-104#
CL$ORG   22-56   22-106#
CL$ORP   22-56   22-105#
CL$ORS   22-56   22-108#
CL$RQH   22-55   22-101#
CL$SKP   22-57    22-99#
CL$STA   22-55    22-94#
CL$WID   22-57   22-100#
CL$WQH   22-55   22-102#
CL$XLN   22-58    22-98#
CLDEVX   1-105     4-99#
CLEOFS    1-55     2-31#
CLKVEC   1-126     2-27#
CLORSZ    1-61    17-59#
CLSCDB   1-125    4-164#
CLSTS    22-58    22-65#
CLTOTL    1-64    18-10#   22-89    22-93    22-94    22-95    22-96    22-97    22-98    22-99   22-100   22-101
        22-102   22-103   22-104   22-105   22-106   22-107   22-108   22-109   22-110   22-111
CLVERS    1-61    4-208#
CLVRSN   4-208   16-468#   22-67
CLX      18-14    18-14    18-14    18-14    18-14    18-14    18-14    18-14#   18-15    18-16    18-17    18-19
         18-19    18-19    18-19    18-19    18-19    18-19    18-19    18-19    18-21    18-21    18-21    18-21
         18-21    18-21    18-21#   18-22    18-24    18-25    18-26    18-26    18-26    18-26    18-26    18-26
         18-26    18-26    18-26    18-28    18-28    18-28    18-28    18-28    18-28    18-28#   18-29    18-31
         18-32    18-33    18-33    18-33    18-33    18-33    18-33    18-33    18-33    18-33    18-41    18-41
         18-41    18-41#   18-42    18-43    18-44    18-46    18-46    18-46    18-46    18-46    18-46    18-46
         18-46    18-46    18-50    18-50    18-50    18-50#   18-51    18-52    18-53    18-55    18-55    18-55
         18-55    18-55    18-55    18-55    18-55    18-55    18-59    18-59    18-59    18-59#   18-60    18-61
         18-62    18-64    18-64    18-64    18-64    18-64    18-64    18-64    18-64    18-64    18-68    18-68
         18-68    18-68#   18-69    18-70    18-71    18-73    18-73    18-73    18-73    18-73    18-73    18-73
         18-73    18-73    18-81    18-81#   18-82    18-82#   20-69    20-69    20-69    20-69    20-69    20-69
         20-69    20-69    20-69    20-69#   20-69#   20-69#
```

```
CLXTRA   1-64      17-53#    18-10     18-10
CMFDON   18-14#    18-16#    18-19     18-21#    18-24#    18-26     18-28#    18-31#    18-33     18-41#    18-44#    18-46
         18-50#    18-53#    18-55     18-59#    18-62#    18-64     18-68#    18-71#    18-73     20-69     20-69     20-69
CMFSEC   1-72      9-81#
CMFTOP   1-72      18-16#    18-24#    18-31#    18-44#    18-53#    18-62#    18-71#
CONFG2   1-105     3-87#
CONFIG   1-99      3-73#
CORTIM   1-109     4-11      16-319#
CORUSR   1-93      3-80#     3-205
CP$RT    2-66      2-69#
CP$STD   2-66      2-68#
CP$SYN   2-66      2-70#
CSHALC   1-62      4-38#
CSHBAS   1-123     4-69#
CSHBFP   1-121     4-130#
CSHCLN   1-123     4-145#
CSHDEV   1-85      4-95#
CSHDVN   1-85      4-96#
CSHFHD   1-121     4-133#
CSHFIN   1-123     4-146#
CSHHD    1-85      4-77#
CSHINI   1-123     4-143#
CSHIO    1-123     4-144#
CSHLRU   1-121     4-131#
CSHMRU   1-121     4-132#
CSHSIZ   1-116     4-337#
CSHVEC   1-123     4-142#
CTRLTT   1-63      4-56#     18-14
CURCDX   2-92#     18-14     18-21     18-28     18-37#    18-41     18-50     18-59     18-68     18-75#
CURMX    2-90#     18-14     18-21     18-28     18-37     18-37     18-37     18-37     18-37     18-37     18-37     18-37
         18-37     18-37#    18-41     18-41     18-50     18-50     18-59     18-59     18-68     18-68     18-75     18-75#
         20-30
CURMXL   18-14#    18-19     18-21#    18-26     18-28#    18-33     18-41     18-41#    18-46     18-50     18-50#    18-55
         18-59     18-59#    18-64     18-68     18-68#    18-73
CURUMR   20-95#
CVTPHY   1-134     3-218
DBGFLG   4-181     16-245#
DCAGE    1-81      2-28#
DCCRD    1-67      4-232#
DCCWR    1-67      4-234#
DCRD1    1-126     4-165#
DCRD2    1-126     4-166#
DCTOTU   1-67      4-230#
DCTRD    1-67      4-231#
DCTWR    1-67      4-233#
DEFBAS   4-107#
DETCBS   1-52      2-8#      18-81     18-82
DEVSIZ   1-101     3-164#
DEVXMR   4-33      16-570#
DFJMEM   1-111     4-332#
DFLAGS   18-14#    18-18#    18-19     18-21#    18-23#    18-26     18-28#    18-30#    18-33     18-41#    18-45#    18-46
         18-50#    18-54#    18-55     18-59#    18-63#    18-64     18-68#    18-72#    18-73
DFLG     1-98      3-63#
DFLMEM   4-29      16-35#    20-10
DHBFSZ   1-75      2-14#
DHOINT   22-34     22-43#
```

```
DHSTOP  22-34      22-40#
DHSTRT  22-34      22-39#
DHTIMR  22-35      22-38#
DHUSE    2-93#     22-26
DHXOFF  22-36      22-42#
DHXON   22-36      22-41#
DIABLO   1-134
DINSPC   4-45      17-10#     18-14      18-21      18-28      18-41      18-50      18-59      18-68      20-69      20-69      20-69
DIS     18-14#     18-19      18-21#     18-26      18-28#     18-33      18-41#     18-46      18-50#     18-55      18-59#     18-64
        18-68#     18-73      20-69      20-69      20-69      20-69#     20-69#     20-69#
DLINT    1-130     18-10      18-10      18-10      18-10      18-10      18-10      18-10
DM$CSR   4-264      4-264#     4-282
DM$LSR   4-265      4-265#     4-281
DM$VEC   4-266      4-266#
DMA      5-19#
DMPKTP   4-172     16-168#
DMPTCR   4-115     16-161#
DOCOPN   1-124      4-154#
DOCULK   1-125      4-159#
DOOPAP   1-124      4-153#
DORLK    1-124      4-157#
DOS     18-14#     18-19      18-21#     18-26      18-28#     18-33      18-41#     18-46      18-50#     18-55      18-59#     18-64
        18-68#     18-73      20-69      20-69      20-69      20-69#     20-69#     20-69#
DOSFCK   1-125      4-161#
DOTLK    1-125      4-158#
DOTSPC   4-46      17-11#     18-14      18-21      18-28      18-41      18-50      18-59      18-68      20-69      20-69      20-69
DOULK1   1-125      4-160#
DSKBUF   1-136      4-41      22-186
DTYPE    1-48      16-542#
DVFLAG   1-114      3-173#
DVFLG   16-543     16-543#    16-544     16-544#    16-545     16-545#    16-546     16-546     16-546#    16-546#    16-547     16-547#
DVNUM    5-38#     16-543     16-543     16-543#    16-544     16-544     16-544#    16-545     16-545     16-545#    16-546     16-546
        16-546#    16-547     16-547     16-547     16-547#
DVSTAT   1-100      3-155#
DWTYPE   1-79       3-108#
EDIT     4-349#
EDITOR   4-191     16-490#
EMTRTN   3-92#
EVEN     4-381#
EVNBUF   5-21#
EXTCHN   1-113      3-181#     3-192      3-203
EXTP1    1-134      3-222
FASTIN   1-53       2-26#
FIRST    4-356#
FNDHRB   1-130      3-219
FORKQ    1-135      3-16
FP$CDI   2-44       2-50#
FP$CDO   2-44       2-51#
FP$CK1   2-44       2-56#
FP$CKT   2-43       2-49#
FP$DEF   2-43       2-52#
FP$FLG   2-44       2-46#      2-47       2-48       2-49       2-50       2-51       2-52       2-53       2-54       2-55       2-56
         2-58       2-59
FP$IOA   2-43       2-54#
FP$IOF   2-43       2-53#
FP$IOS   2-43       2-58#
```

```
FP$MAX   2-44      2-47#
FP$MOV   2-43      2-59#
FP$PIO   2-44      2-55#
FP$RT    2-43      2-48#
FREFRK   1-88      4-289#
FREIOQ   1-102     4-237#
FREPGS   1-110     4-329#
FREUMR   1-47      3-19
FRKADR   3-93#
FRKDLY   1-94      4-55#
FRKGEN   1-56      2-9#      4-292
FRKGET   1-135     3-15
FRKINI   1-56      4-290#
FRKLST   4-289     4-291#
FSTDL    1-92     18-10#
FSTIOL   1-49     18-10     18-10#
FSTSL    1-63     18-10#
FULLST   1-39#     1-41     15-1      19-1      19-2      22-174
GENTOP   1-109    22-173#
GETRTQ   1-135     3-10
GETUMR   1-47      3-18
HANBUF   5-27#
HANDSK   1-46      3-158#
HANENT   1-100     3-8       3-151#
HANIOC   1-101     3-170#
HANPAR   1-119     3-9       3-167#
HANRCB   1-46      4-118#
HANRCO   1-46      3-230#
HANSIZ   1-100     3-161#
HANXMR   1-134     3-220
HAZEL    1-134
HIMAP    1-110     4-327#
HIMEM    3-67      4-28     16-30#    20-6      20-10
HIPRCT   4-12     16-310#
HNMEPT   3-104     3-228#
HNSPDO   5-28#
HSUFFX   3-96#
I       18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
        18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
        18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10#
        18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#
        18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#
ILSW2   18-10     18-10#    18-19     18-26     18-33     18-46     18-55     18-64     18-73
INDDBL   1-104     4-63#
INDDBS   1-104     4-64#
INDDEV   3-114#
INDFIL   1-91     16-25#
INDOFF   3-103     3-113#
INDSAV   1-103     4-62#
INDTSV   1-104     3-188#    3-210
INIABT   4-175    16-120#
ININT    1-130    18-10     20-79
INMXV    1-59     20-79#
INRECV   1-57     18-10#
INSTA    3-99#     3-208
INSTBL   1-51      4-91#
```

```
INSTBN   1-51      4-92#
INTEN    1-132     3-37
INTIOC   4-13     16-303#
INTSSZ   1-102     2-20#
INVEC    1-56     18-10     18-10#    18-14     18-21     18-28
IOABFL   1-63      4-106#
IOABT    4-106    16-178#
IOFIN    1-132     3-68
IOHANG   1-47      3-17
IOHLTM   1-54      2-30#
IOLFLG   8-52#    18-14     18-14     18-16     18-17     18-19     18-19     18-19     18-19#    18-21     18-21     18-24
        18-25     18-26     18-26     18-26     18-26#    18-28     18-28     18-31     18-32     18-33     18-33     18-33
        18-33#    18-41     18-41     18-43     18-44     18-46     18-46     18-46     18-46#    18-50     18-50     18-52
        18-53     18-55     18-55     18-55     18-55#    18-59     18-59     18-61     18-62     18-64     18-64     18-64
        18-64#    18-68     18-68     18-70     18-71     18-73     18-73     18-73     18-73#    20-69     20-69     20-69
        20-69     20-69     20-69     20-69#    20-69#    20-69#
IOLN     8-53#
IOQSIZ   1-136     3-21
IOSTRT   1-135     3-13
ITRMTP  18-10     18-10#    18-17     18-25     18-32     18-43     18-52     18-61     18-70
JCXPGS   1-111     4-330#
K52      4-352#
KED      4-351#   16-490
KEYMAX   4-35     16-230#
KMNHI    1-53      4-60#
KMNTOP   1-53      4-59#
KUSECK   1-119     2-29#
L       16-547    16-547    16-547#
LA120    1-133
LA36     1-133
LABTIM  18-10     18-10#
LACTIV  18-10     18-10#
LAFSIZ  18-10     18-10#
LAST     4-358#
LBASE   18-10     18-10#
LBRKCH  18-10     18-10#
LBRKCQ  18-10     18-10#
LBSPRI  18-10     18-10     18-10#
LCDTIM  18-10     18-10#
LCDTYP  18-10     18-10#    18-14     18-21     18-28     18-41     18-50     18-59     18-68
LCLUNT  18-10     18-10#
LCMPL   18-10     18-10#
LCMQHD  18-10     18-10#
LCOL    18-10     18-10#
LCONTM  18-10     18-10#
LCPUHI  18-10     18-10#
LCPULO  18-10     18-10#
LCXPAR  18-10     18-10#
LCXTBL  18-10     18-10#    18-19     18-26     18-33     18-46     18-55     18-64     18-73
LDDEVX   1-105     4-98#
LDHB1B  18-10     18-10#
LDHB1P  18-10     18-10#
LDHB2B  18-10     18-10#
LDHB2R  18-10     18-10#
LDHB2S  18-10     18-10#
LDSYS    4-179    16-212#
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LDVERS     1-61       4-209#
LEMTPC    18-10      18-10#
LESCHR    18-10      18-10#
LESRTN    18-10      18-10#
LF        18-19      18-19#     18-19#     18-26      18-26#     18-26#     18-33      18-33#     18-33#     18-46      18-46#     18-46#
          18-55      18-55#     18-55#     18-64      18-64#     18-64#     18-73      18-73#     18-73#     20-69      20-69      20-69
          20-69#     20-69#     20-69#
LFWLIM    18-10      18-10#
LHIPCT    18-10      18-10#
LHIRBA    18-10      18-10#     18-19      18-26      18-33      18-46      18-55      18-64      18-73
LHIRBB    18-10      18-10#
LHIRBC    18-10      18-10#     18-19      18-26      18-33      18-46      18-55      18-64      18-73
LHIRBE    18-10      18-10#
LHIRBG    18-10      18-10#
LHIRBP    18-10      18-10#
LHIRBS    18-10      18-10#
LINBUF    18-10      18-10#
LINCNT    18-10      18-10#
LINCUR    18-10      18-10#
LINEND    18-10      18-10#
LINIR     18-10      18-10#
LINNUM     1-93       1-130      4-196#    18-10*     18-10*     18-10*     18-10*     18-10*     18-10*     18-10*
LINNXT    18-10      18-10#
LINPNT    18-10      18-10#
LINSIZ    18-10      18-10#     18-19      18-26      18-33      18-46      18-55      18-64      18-73      20-69      20-69      20-69
LINSPC    18-10      18-10#
LIOCNT    18-10      18-10#
LIOHLD    18-10      18-10#
LITIME    18-10      18-10#
LJSW      18-10      18-10#
LMEMIN    18-10      18-10#
LMINQ     18-10      18-10#
LMONHD    18-10      18-10#
LMSGBF    18-10      18-10#
LMXLN      1-59      18-10#     18-41      18-50      18-59      18-68
LMXNUM    18-10      18-10#     18-41      18-50      18-59      18-68
LMXPRM     1-59      18-10      18-10#     18-19      18-26      18-33      18-46      18-55      18-64      18-73
LN         8-49#     18-14      18-14      18-14#     18-19      18-21      18-21      18-21#     18-26      18-28      18-28      18-28#
          18-33      18-41      18-41      18-41#     18-46      18-50      18-50      18-50#     18-55      18-59      18-59      18-59#
          18-64      18-68      18-68      18-68#     18-73      18-81      18-81      18-81#     18-82      18-82      18-82#     20-49
          20-52      20-69      20-69      20-69      20-69      20-69      20-69      20-69#     20-69#     20-69#
LNAME     18-10      18-10#     18-15      18-22      18-29      18-42      18-51      18-60      18-69
LNBLKS    18-10      18-10#
LNMAP      1-60      18-10#
LNMTOP     1-48      18-15#     18-22#     18-29#     18-42#     18-51#     18-60#     18-69#
LNPRIM     1-60      18-10#
LNSBLK    18-10      18-10#
LNSPAC    18-10      18-10#
LOFFTM    18-10      18-10#
LOGCHN     1-68       2-84#
LOKBAS     1-82       4-68#
LOKCSH     1-82       4-72#
LOKINI     1-124      4-152#
LOKMEM     1-82       4-71#
LOKVEC     1-124      1-126      4-151#
LOMAP      1-110      4-326#
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LOTEND  18-10     18-10#
LOTNXT  18-10     18-10#
LOTPNT  18-10     18-10#
LOTSIZ  18-10     18-10#    18-19     18-26     18-33     18-46     18-55     18-64     18-73     20-69     20-69     20-69
LOTSPC  18-10     18-10#
LOUTIR  18-10     18-10#
LPARBS  18-10     18-10#
LPARNT  18-10     18-10#
LPRG1   18-10     18-10#
LPRG2   18-10     18-10#
LPRI     1-60     18-10#
LPROG   18-10     18-10#
LPROJ   18-10     18-10#
LQLINK  18-10     18-10#
LQUAN   18-10     18-10#
LRBFIL  18-10     18-10#
LRDTIM  18-10     18-10#
LRTCHR  18-10     18-10#
LSCCA   18-10     18-10#
LSECPT  18-10     18-10#    18-19     18-26     18-33     18-46     18-55     18-64     18-73
LSLEPH  18-10     18-10#
LSLEPL  18-10     18-10#
LSNDCH  18-10     18-10#
LSPACT  18-10     18-10#    18-19     18-26     18-33     18-46     18-55     18-64     18-73     20-69     20-69     20-69
LSPND   18-10     18-10#
LSTACT  18-10     18-10#
LSTATE  18-10     18-10#
LSTDL    1-92     18-10     18-10#
LSTHL    1-49     18-10#
LSTIOL   1-57     18-10#
LSTLIN   1-58     18-10#
LSTMX    1-58      2-89#    18-37     18-37     18-37#    20-76     20-81
LSTPL    1-57     18-10     18-10     18-10#
LSTPRM   9-137#   18-19     18-19     18-26     18-26     18-33     18-33     18-46     18-46     18-55     18-55     18-64
        18-64     18-73     18-73
LSTSL    1-63     18-10     18-10#
LSUCF   18-10     18-10#    18-16     18-24     18-31     18-44     18-53     18-62     18-71     18-81     18-82
LSW     18-10     18-10#
LSW10   18-10     18-10#
LSW11   18-10     18-10#
LSW2    18-10     18-10#
LSW2S   18-10     18-10#
LSW3    18-10     18-10#
LSW4    18-10     18-10#
LSW5    18-10     18-10#
LSW6    18-10     18-10#
LSW7    18-10     18-10#
LSW8    18-10     18-10#
LSW9    18-10     18-10#
LSWPBK  18-10     18-10#
LTRMTP  18-10     18-10#
LTSCMD  18-10     18-10#
LTTCR   18-10     18-10#
LTTPAR  18-10     18-10#
LUNAME   1-57     18-10#
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LWINDO   18-10     18-10#
LX        8-51#    18-14     18-14     18-14#    18-21     18-21     18-21#    18-28     18-28     18-28#    18-41     18-41
         18-41#    18-50     18-50     18-50#    18-59     18-59     18-59#    18-68     18-68     18-68#    18-81     18-81
         18-81#    18-82     18-82     18-82#    20-69     20-69     20-69     20-69     20-69     20-69     20-69#    20-69#
         20-69#
LXCL     18-10     18-10#
LXX      18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
         18-10     18-10     18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#    18-10#
MAPH      5-25#    16-546
MAPIO     5-20#
MAPPAR    1-84      4-328#
MAPSIZ    1-113     4-324#
MAPUSR    1-92      4-195#
MAXALC    1-86     16-387#   20-118    20-122
MAXBLK    1-99      3-75#
MAXCSH    4-94     16-377#   20-109
MAXDEV    1-101     2-5#      3-148     3-151     3-155     3-158     3-161     3-164     3-167     3-170     3-173    16-543
         16-544    16-545    16-546    16-547    16-547
MAXFIL    3-75      4-19     16-354#
MAXGVL    1-105     3-176#
MAXMC     4-24     16-636#
MAXMON    4-21     16-391#
MAXMRB    4-27     16-648#
MAXMSG    4-26     16-644#
MAXMUX    2-13#     4-251     4-252     4-253     4-254     4-255     4-256     4-257     4-258     4-259     4-260     4-261
          4-262     4-263     4-264     4-265     4-266
MAXSEC    1-64     16-349#   18-19     18-19     18-26     18-26     18-33     18-33     18-46     18-46     18-55     18-55
         18-64     18-64     18-73     18-73
MAXSF     4-14     16-606#   21-4
MAXSFC    4-15      4-74     16-613#
MAXWIN    4-34     16-239#
MEM256    1-87      4-205#
MEMPTR    1-50      3-104#
MEMSIZ    4-324    16-100#
MFPMOV    3-125#    3-212
MFPS      3-84      3-124#
MH$BAR    1-75      4-275#
MH$BCR    1-75      4-274#    4-285
MH$BRK    4-261     4-261#
MH$CAR    1-74      4-273#    4-283
MH$LPR    4-262     4-262#    4-280
MH$PBR    4-263     4-263#
MH$RCR    1-74      4-272#    4-279
MH$SCR    1-74      4-271#    4-278
MH$SSR    1-75      4-276#    4-284
MHNSIZ    1-119     4-335#
MIDDLE    4-357#   16-205
MINTIM    1-94      4-57#
MIOBHD    1-52      4-79#
MIOBSZ    4-193    16-562#   20-138
MIODBG    1-84      2-22#
MIOFLG    1-88      4-206#
MIONBF    4-192    16-557#
MIONWB    1-91      2-21#
MIOSYQ    1-116     4-81#
MIOWHD    1-116     4-80#
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MODDAT   1-70      4-116#
MODTIM   1-72      4-117#
MONAME   3-95#
MONFQH   1-61      4-78#
MONVEC   1-103     3-37#     3-94      3-104     3-110     3-113     3-176
MPARFL   1-117     2-23#
MSCHRS   4-25      16-640#
MSGBAS   1-80      4-66#
MTPS     3-83      3-140#
MUXNUM   1-93      1-131     4-197#    20-78*
MVSIZ    1-69      3-196#    3-197
MVWDS    1-113     3-197#
MXBRK    1-74      4-269#
MXCAR    4-258     4-258#    4-269     4-276     18-37
MXCSR    4-252     4-252#    4-271     18-37
MXDTR    4-255     4-255#    4-274     18-37
MXJADR   1-108     4-333#
MXJMEM   1-111     4-331#
MXLBLK   4-17      16-619#
MXLNT    4-260     4-260#
MXLPR    4-253     4-253#    4-267     18-37
MXRBUF   1-74      4-267#    4-272
MXRING   1-74      4-268#
MXSBRK   4-257     4-257#
MXSPAC   1-73      16-473#   18-19     18-26     18-33     18-46     18-55     18-64     18-73     20-69     20-69     20-69
MXTBUF   4-256     4-256#    4-268     4-275     18-37
MXTCR    4-254     4-254#    4-273     18-37
MXTTCT   1-46      16-481#   18-19     18-19     18-26     18-26     18-33     18-33     18-46     18-46     18-55     18-55
         18-64     18-64     18-73     18-73
MXTYPE   4-251     4-251#    18-37
MXVEC    4-259     4-259#    18-37
NAMDON   18-14#    18-15#    18-19     18-21#    18-22#    18-26     18-28#    18-29#    18-33     18-41#    18-42#    18-46
         18-50#    18-51#    18-55     18-59#    18-60#    18-64     18-68#    18-69#    18-73     20-69     20-69     20-69
NAMPTR   18-15     18-15#    18-16     18-16#    18-22     18-22#    18-24     18-24#    18-29     18-29#    18-31     18-31#
         18-42     18-42#    18-44     18-44#    18-51     18-51#    18-53     18-53#    18-60     18-60#    18-62     18-62#
         18-69     18-69#    18-71     18-71#
NAMSEC   1-48      9-27#
NCLDF    8-55#     20-40     20-55
NCSILO   1-62      4-42      17-32#    20-17     20-18
NCXOFF   1-62      4-43      17-38#    20-19     20-20     20-20#
NCXON    1-62      4-44      17-44#    20-21     20-22     20-22#
NDL      1-92      18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
         18-10     18-10     18-10#    18-81     18-81     18-82     18-82     20-43     20-49     20-52
NDLDF    8-56#     18-81     18-81#    18-82     18-82#    20-43
NDRTDF   2-32#     21-23
NDVRCB   1-59      4-33#
NESB     1-53      16-594#
NFRESB   1-55      4-88#
NGR      4-32      16-79#
NIOL     1-49      18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
         18-10     18-10     18-10     18-10     18-10     18-10#    20-40     20-55
NLCHN    1-50      2-88#     3-182
NLIN2    1-49      18-10     18-10#
NLINES   1-50      18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
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         18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
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                18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
                18-10     18-10     18-10     18-10     18-10#
        NMFCSH   4-20     16-382#   20-112
        NMFREQ   1-102    22-156#
        NMSNMB   1-109     2-10#     4-76
        NMSYMB   2-11#     4-76
        NMUMB    1-109     4-76#
        NOCACH   5-22#
        NODMA    5-31#     5-32
        NOMAPH   5-26#
        NOMOUN   5-23#
        NONDMA   5-32#
        NONE     4-383#    9-137
        NOSET    5-29#
        NPL      1-49     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
                18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10#
                18-14     18-19     18-21     18-26     18-28     18-33     18-41     18-46     18-50     18-55     18-59     18-64
                18-68     18-73     18-81     18-82     20-37     20-49     20-52     20-69     20-69     20-69
        NPLDF    8-54#    18-14     18-14#    18-21     18-21#    18-28     18-28#    18-41     18-41#    18-50     18-50#    18-59
                18-59#    18-68     18-68#    20-37
        NRMFLG   4-39     17-84#    18-14     18-18     18-21     18-23     18-28     18-30     18-41     18-45     18-50     18-54
                18-59     18-63     18-68     18-72
        NSCP     1-65      2-19#
        NSL      1-49     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10     18-10
                18-10     18-10     18-10#    20-61     20-62
        NSPLBL   1-60      4-87#
        NSPLDV   1-55      4-207#
        NSPLFL   1-60      4-86#
        NUCHN    1-69      2-12#     2-83      2-84      2-85      2-86      2-87      2-88
        NUIP     4-36     16-249#
        NUMCCB   1-107     2-18#
        NUMCDB   1-81      4-74#
        NUMDC    4-16      4-73     16-626#
        NUMDCD   1-81      4-73#
        NUMDEV   1-101     3-7       4-236#
        NUMFRK   1-57      2-6#
        NUMIOQ   1-102     2-16#    22-13     22-13#    22-156
        NUMON    1-93      4-198#
        NUMRDB   1-84      2-91#    21-25     21-25     21-25#    21-25#
        NUMSYQ   1-102     2-17#    22-14     22-14#    22-156
        NXIVMH   1-57      2-7#
        ODD      4-382#
        OFFTIM   4-23     16-419#
        OTMXV    1-59     20-81#
        OTRASZ   1-60     17-17#
        OTRECV   1-57     18-10#
        P1EXT    3-105#
        P1XPTR   3-105     3-222#
        PHONE    4-194    16-431#   22-164
        PHYMEM   1-50      3-147#
        PIDPTR   1-117     4-112#
        PMSIZE   1-73     16-671#   20-131
        PNAME    1-100     3-94      3-148#
        PNPTR    3-94#
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PRIDEF   4-184    16-338#
PRIHI    4-183    16-334#
PRILOW   4-182    16-333#
PRIVIR   4-185    16-345#
PROBRK   1-118     2-24#
PROFLG   1-117     4-201#
PROITP   1-130    22-183
PROODC   1-118     2-25#
PROSLT   1-100     4-113#
PSW      1-132     3-125
PVON     1-93      4-199#
PVSPBL   1-59     16-594    16-594    16-594    16-594#
PWCH     4-188    16-448#
QBUS     1-114     4-300#   16-90
QCOMP    1-98      3-68#
QCOMPL   1-135     3-14
QFREE    1-135     3-11
QIO      1-135     3-12
QUAN0    4-4      16-258#
QUAN1    1-58      4-5      16-267#
QUAN1A   1-68      4-6      16-273#
QUAN1B   1-68      4-7      16-277#
QUAN1C   4-8      16-282#
QUAN2    1-58      4-9      16-290#
QUAN3    4-10     16-296#
QUME     1-134
R$CFST   1-58      3-209#
R$CH17   1-112     3-202#
R$CHN    1-112     3-201#
R$DATE   1-112     3-204#
R$INST   1-58      3-208#
R$INTC   1-104     3-210#
R$JOB    1-112     3-205#
R$MFMV   1-92      3-212#
R$SWPC   1-119     3-211#
R$TTOP   1-58      3-207#
R$UBAS   1-112     3-206#
R$XCHN   1-113     3-203#
RBR      1-56     18-10     18-10     18-10#    18-14     18-21     18-28
RDB      1-84      4-343#
RDBEND   1-84     22-169#
RDBSEC   1-48      4-342#
REQALC   5-24#
RF$WRT   1-109
RMNBAS   1-131     3-102     3-103
RPRCSR   1-79      3-106#
RPRVEC   1-79      3-107#
RSFBLK   1-90     16-17#
RSR      1-56     18-10     18-10#    18-14     18-21     18-28
RTVECT   1-94     16-662#   22-8      22-13     22-14     22-16
RUNCHN   1-76      2-86#
S       18-14     18-14     18-14     18-14#    18-14#    18-14#    18-15     18-15#    18-16     18-16#    18-17     18-17#
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        18-22     18-22#    18-24     18-24#    18-25     18-25#    18-26     18-26     18-26     18-26     18-26     18-26
        18-26     18-26     18-26     18-26     18-26#    18-26#    18-26#    18-26#    18-26#    18-26#    18-26#    18-26#
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         18-28     18-28     18-28     18-28#    18-28#    18-28#    18-29     18-29#    18-31     18-31#    18-32     18-32#
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         18-33#    18-33#    18-33#    18-33#    18-33#    18-33#    18-37     18-37#    18-41     18-41     18-41#    18-41#
         18-42     18-42#    18-43     18-43#    18-44     18-44#    18-46     18-46     18-46     18-46     18-46     18-46
         18-46     18-46     18-46     18-46     18-46#    18-46#    18-46#    18-46#    18-46#    18-46#    18-46#    18-46#
         18-50     18-50     18-50#    18-50#    18-51     18-51#    18-52     18-52#    18-53     18-53#    18-55     18-55
         18-55     18-55     18-55     18-55     18-55     18-55     18-55     18-55     18-55#    18-55#    18-55#    18-55#
         18-55#    18-55#    18-55#    18-55#    18-59     18-59     18-59#    18-59#    18-60     18-60#    18-61     18-61#
         18-62     18-62#    18-64     18-64     18-64     18-64     18-64     18-64     18-64     18-64     18-64     18-64
         18-64#    18-64#    18-64#    18-64#    18-64#    18-64#    18-64#    18-64#    18-68     18-68     18-68#    18-68#
         18-69     18-69#    18-70     18-70#    18-71     18-71#    18-73     18-73     18-73     18-73     18-73     18-73
         18-73     18-73     18-73     18-73     18-73#    18-73#    18-73#    18-73#    18-73#    18-73#    18-73#    18-73#
         18-81     18-81     18-81     18-81#    18-82     18-82     18-82     18-82#    20-18#    20-19     20-21     20-69
         20-69     20-69     20-69     20-69     20-69     20-69     20-69     20-69     20-69#    20-69#    20-69#    20-69#
         20-69#    20-69#    20-69#    20-69#    20-69#
S110      4-364#
S1200     4-369#
S134.5    4-365#
S150      4-366#
S1800     4-370#
S19200    4-377#
S2000     4-371#
S2400     4-372#
S300      4-367#
S3600     4-373#
S4800     4-374#
S50       4-362#
S600      4-368#
S7200     4-375#
S75       4-363#
S9600     4-376#     9-137
SASECT    1-48      10-6#
SCHED     1-136      4-40      22-185
SCPFHD    1-51       4-97#
SD$HLD    1-131
SDBULS    1-91      16-594#
SDCB      1-54      16-594#
SDCBND    1-54      16-594#
SDCBSZ    1-91      16-594    16-594#
SEGBLK    4-31      16-75#
SEGCHN    1-90       4-58#
SETERR    1-131
SFCB      1-68       4-83#
SFCBFH    1-53       4-85#
SFCBND    1-68       4-84#
SFCLS     1-125      4-162#
SFRSST    1-124      4-156#
SFSVST    1-124      4-155#
SFWRIT    1-125      4-163#
SHRRCB    1-51       4-89#
SHRRCN    1-51       4-90#
SILSIZ   18-14#    18-19     18-21#    18-26     18-28#    18-33     18-41#    18-46     18-50#    18-55     18-59#    18-64
         18-68#    18-73
SILXOF   18-14#    18-19     18-21#    18-26     18-28#    18-33     18-41#    18-46     18-50#    18-55     18-59#    18-64
         18-68#    18-73
SILXON   18-14#    18-19     18-21#    18-26     18-28#    18-33     18-41#    18-46     18-50#    18-55     18-59#    18-64
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          18-68#     18-73
SIZMEM     4-324      4-324      4-324      4-324      4-324#     4-324#
SLEDIT     4-180     16-221#
SMONHD     1-48       4-82#
SMRSIZ     1-116      4-334#
SNBUX      1-89      16-594     16-594     16-594     16-594     16-594#
SNDBX      1-87       4-87      16-594#
SNMSHD     1-108      4-75#
SPLANM     1-91      16-594#
SPLBHD     1-53      16-594#
SPLBLK     1-55      16-13#
SPLCHN     1-101     16-594#
SPLDEV     1-54      16-594     16-594#
SPLDVN     1-54      16-594     16-594#
SPLNB      1-52      16-594     16-594     16-594#
SPLND      1-52      16-594     16-594     16-594#
SPLNF      1-52       4-86      16-594     16-594#
SPOLID     1-118      4-104#
SPSTAT     1-61       3-97#
SPUSR      1-99       3-69#
SR3FLG     1-115      4-204#
SRERR     18-14      18-14#     18-21      18-21#     18-28      18-28#     18-37      18-37#
SRTSIZ     1-116      4-336#
STPFLG     1-94       4-202#
SWAPFL     4-173     16-51#     18-10
SWDBLK     1-65      16-9#
SWPCHN     1-102      3-192#     3-211
SWPSLT     4-30      16-65#     18-10      18-10
SYCHO      1-95       3-42#
SYCH1      1-95       3-43#
SYCH10     1-96       3-50#
SYCH11     1-96       3-51#
SYCH12     1-96       3-52#
SYCH13     1-96       3-53#
SYCH14     1-97       3-54#
SYCH15     1-97       3-55#
SYCH16     1-97       3-56#
SYCH17     1-97       3-57#      3-202
SYCH2      1-95       3-44#
SYCH20     1-97       3-58#
SYCH3      1-95       3-45#
SYCH4      1-95       3-46#
SYCH5      1-95       3-47#
SYCH6      1-96       3-48#
SYCH7      1-96       3-49#
SYINDX     1-105      3-85#
SYNAME     1-106      4-108#
SYNCH      1-132      3-81
SYPSPR     1-47       4-210#
SYPSWD     1-47      16-404     16-404     16-404#
SYSCHN     1-95       3-41#      3-201
SYSDAT     1-98       3-62#      3-204
SYSDMP     4-171     16-153#
SYSGEN     1-105      3-88#
SYSPSS    10-177#    16-404#    22-160
SYSUPD     1-99       3-72#
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SYSVER   1-99     3-71#
SYTIMH   1-101    4-47#
SYTIML   1-101    4-48#
SYUNIT   1-99     3-70#
T        18-19    18-19#   18-26    18-26#   18-33    18-33#   18-46    18-46#   18-55    18-55#   18-64    18-64#
         18-73    18-73#   20-69    20-69    20-69    20-69#   20-69#   20-69#   21-25    21-25    21-25#   21-25#
TBR      1-57     18-10    18-10#   18-14    18-21    18-28
TECO     4-350#
TIMOUT   4-22     16-412#
TIOBAS   1-82     4-70#
TK1CNT   1-65     4-51#
TK1SEC   1-65     4-49#
TK1VAL   1-103    4-50#
TK3SVL   1-111    4-53#
TK5VAL   1-111    4-52#
TMIDLH   1-107    4-225#
TMIDLL   1-107    4-226#
TMIOH    1-65     4-219#
TMIOL    1-65     4-220#
TMIOWH   1-66     4-223#
TMIOWL   1-66     4-224#
TMSWPH   1-66     4-221#
TMSWPL   1-66     4-222#
TMSWTH   1-107    4-217#
TMSWTL   1-107    4-218#
TMTOTH   1-106    4-213#
TMTOTL   1-106    4-214#
TMUSRH   1-106    4-215#
TMUSRL   1-106    4-216#
TNHL     1-49     18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
         18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
         18-10    18-10    18-10    18-10    18-10    18-10#
TOTON    1-93     4-200#
TSDEFS   1-134    4-107
TSDHIO   22-34    22-37#
TSGEN    1-42#    1-48
TSLICH   4-186    16-436#
TSR      1-56     18-10    18-10#   18-14    18-21    18-28
TSXSIT   1-69     4-54#
TSXVEC   3-7#     3-36
TSXVRS   1-47     2-4#     3-20
TTCSCH   1-56     2-15#
TTOP     3-111#   3-207
TTOPTS   1-113    3-102    3-110#
U$CL     4-177    16-187#
UBUSMP   1-87     4-203#
UCLBLK   1-115    4-110#
UCLDAT   1-115    16-21#
UCLMNC   4-18     16-194#
UCLNAM   1-52     4-109#
UCLORD   4-178    16-205#
UKMNAM   1-54     4-111#
UMRBAS   20-85    20-96#
UMREND   20-85    20-105#
UMRWHD   20-85    20-86#
UMSYTP   1-89     4-105#
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UNIBUS   1-114     4-301#   20-97
USPLCH   1-87      2-85#
USRBAS   1-80      4-65#
USROFF   3-67#     3-206
USWPCH   1-119     2-87#     3-192
UXIFLG   4-176    16-141#
VBUSTP   1-114     4-174#
VCBBAS  22-6      22-7#
VCBEND  22-6      22-12#
VCORTM   1-83      4-11#
VCSHNB   1-66      4-37#
VCXCTL   1-75      4-190#
VCXTRM   1-75      4-189#
VDBFLG   1-118     4-181#
VDFMEM   1-108     4-29#
VDISPC   1-70      4-45#
VDMKTP   1-70      4-172#
VDMTCR   1-70      4-115#
VDOSPC   1-70      4-46#
VDSKBU   1-72      4-41#
VECBAS   1-108     3-36#    3-196    3-201    3-202    3-203    3-204    3-205    3-206    3-207    3-208    3-209
         3-210     3-211    3-212
VEDIT    1-64      4-191#
VERR    18-14     18-14#   18-21    18-21#   18-28    18-28#   18-37    18-37#
VH$BA1   1-77      4-283#
VH$BA2   1-77      4-284#
VH$BCR   1-77      4-285#
VH$CSR   1-76      4-278#
VH$DBR   1-76      4-279#
VH$LCR   1-77      4-282#
VH$LPR   1-76      4-280#
VH$LSR   1-76      4-281#
VHIMEM   1-103     4-28#
VHIPCT   1-94      4-12#
VHOINT  22-35     22-48#
VHSTOP  22-35     22-45#
VHSTRT  22-35     22-44#
VHXOFF  22-36     22-47#
VHXON   22-36     22-46#
VIDCSR   1-100     4-114#
VINABT   1-63      4-175#
VINTIO   1-89      4-13#
VKEYMX   1-72      4-35#
VLDSYS   1-60      4-179#
VLSWCH   4-187    16-442#
VMAXMC   1-80      4-24#
VMIOBF   1-81      4-192#
VMIOSZ   1-79      4-193#
VMLBLK   1-90      4-17#
VMSCHR   1-79      4-25#
VMXCSH   1-85      4-94#
VMXFIL   1-108     4-19#
VMXMON   1-61      4-21#
VMXMRB   1-80      4-27#
VMXMSG   1-80      4-26#
VMXSF    1-90      4-14#
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VMXSFC   1-90      4-15#
VMXWIN   1-55      4-34#
VNCSLO   1-71      4-42#
VNCXOF   1-71      4-43#
VNCXON   1-71      4-44#
VNFCSH   1-85      4-20#
VNGR     1-51      4-32#
VNRFLG   1-69      4-39#
VNUIP    1-51      4-36#
VNUMDC   1-81      4-16#
VOFFTM   1-86      4-23#
VPLAS    1-90      4-31#
VPRIDF   1-99      4-184#
VPRIHI   1-98      4-183#
VPRILO   1-98      4-182#
VPRIVR   1-64      4-185#
VQUAN0   1-73      4-4#
VQUAN1   1-83      4-5#
VQUAN2   1-83      4-9#
VQUAN3   1-73      4-10#
VQUN1A   1-83      4-6#
VQUN1B   1-83      4-7#
VQUN1C   1-69      4-8#
VSCHED   1-72      4-40#
VSLEDT   1-56      4-180#
VSWPFL   1-92      4-173#
VSWPSL   1-55      4-30#
VSYDMP   1-70      4-171#
VT100    1-133    18-17     18-25     18-32     18-43     18-52     18-61     18-70
VT200    1-133
VT52     1-133
VTMOUT   1-87      4-22#
VTSLCH   1-73      4-186#
VU$CL    1-52      4-177#
VUCLMC   1-115     4-18#
VUCLOR   1-115     4-178#
VUSPHN   1-126     4-194#
VUXIFL   1-62      4-176#
VVLSCH   1-73      4-187#
VVPWCH   1-73      4-188#
WILDFL   1-64     16-496#
WINBAS   1-80      4-67#
X       16-543    16-543#   16-544    16-544#   16-545    16-545#   16-546    16-546#   16-547    16-547#
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TSGEN -- System Generation Para MACRO V05.04  Thursday 17-Dec-87 08:20 Page M-1
Cross reference table (CREF V05.04)


BUFSIZ   9-49#    20-69    20-69    20-69
CHNRES   3-25#     3-42     3-43     3-44     3-45     3-46     3-47     3-48     3-49     3-50     3-51     3-52
         3-53      3-54     3-55     3-56     3-57     3-58     3-184    3-184    3-184    3-184    3-184    3-184
         3-184     3-184    3-188
CLDEF    8-11#
CLEND   10-132#
CLTABL  22-82#    22-93    22-94    22-95    22-96    22-97    22-98    22-99    22-100   22-101   22-102   22-103
        22-104    22-105   22-106   22-107   22-108   22-109   22-110   22-111
CMDFIL   9-83#    18-16    18-24    18-31    18-44    18-53    18-62    18-71
DETACH  10-141#   18-81    18-82
DEVBEG   5-7#     16-542
DEVDEF   5-40#    16-543   16-544   16-545   16-546   16-547
DEVEND   5-109#   16-547
DHDEF   11-14#
DHUDEF  12-57#
DHVDEF  12-12#
DZDEF   13-44#
FLAGS    9-6#     18-18    18-23    18-30    18-45    18-54    18-63    18-72
LINDEF   8-58#    18-14    18-21    18-28    18-41    18-50    18-59    18-68
LINEND  10-8#     18-19    18-26    18-33    18-46    18-55    18-64    18-73    20-69    20-69    20-69
LINPRM   9-106#
MEMORY   4-307#    4-324
MUXDEF  13-12#    18-37
MUXEND  13-52#    18-75
MXTBL    4-241#    4-251    4-252    4-253    4-254    4-255    4-256    4-257    4-258    4-259    4-260    4-261
         4-262     4-263    4-264    4-265    4-266
NAME     9-29#    18-15    18-22    18-29    18-42    18-51    18-60    18-69
OB       6-7#     18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
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        18-10     18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
        18-10     18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
        18-10     18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
        18-10     18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
        18-10
OBH      6-37#    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
        18-10     18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
        18-10     18-10
OBP      6-22#    18-10    18-10    18-10    18-10    18-10    18-10    18-10
OBT      6-52#    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10    18-10
PAGE     9-73#
RTDEF   10-198#   21-25    21-25
SILO     9-63#
SPEED    9-139#
SPOOL   14-13#    16-594
SRCHK    9-198#   18-14    18-21    18-28    18-37
SYSPS   10-178#   16-404
TBLDEF   6-71#    18-10
TRMTYP   9-12#    18-17    18-25    18-32    18-43    18-52    18-61    18-70
UMRDEF  20-87#
VECCHK   9-183#   18-14    18-21    18-28    18-37
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