```
                                        .TITLE  TSGEN -- System Generation Parameters
                                        .IDENT  /V6.40/
000000                                  .CSECT  TSGEN
                                        .ENABL  LC
                                        .DSABL  GBL
                                        .NLIST  CND
                                ;-----------------------------------------------------------------------------
                                ;  TSGEN *** PRO/TSX-Plus *** version 6.40
                                ;
                                ;  This module contains the the definitions of system parameters
                                ;  that define the characteristics of the TSX-Plus system
                                ;  being generated.
                                ;
                                ;  Written by Phil Sherrod.
                                ;
```

```
                                ;
                                ;
                                ;  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,KMONCE,EXCJOB,DOSCHD
                                        .GLOBL  IOHANQ,GETUMR,FREUMR,SYPSWD,SYPSPR,TSXVRS,VMNUAO
                                        .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$CFST
        .GLOBL  INMXV,OTMXV,PVSPBL,LMXLN,LMXPRM,NDVRCB
        .GLOBL  OTRASZ,LNMAP,LNPRIM,LPRI,VLDSYS,NSPLFL,NSPLBL
        .GLOBL  CLVERS,CLORSZ,VMXMON,MONFQH,SPSTAT,LDVERS
        .GLOBL  NCSILO,NCXOFF,NCXON,CSHALC,VUXIFL
        .GLOBL  LSTSL,FSTSL,CTRLTT,VINABT,IOABFL
        .GLOBL  MAXSEC,VEDIT,WILDFL,VPRIVR,CLXTRA,CLTOTL
        .GLOBL  SWDBLK,TMIOL,TMIOH,TK1CNT,TK1SEC,NSCP
        .GLOBL  TMSWPL,TMSWPH,TMIOWL,TMIOWH,VCSHNB
        .GLOBL  DCTOTU,DCTRD,DCCRD,DCTWR,DCCWR
        .GLOBL  SFCB,SFCBND,QUAN1A,LOGCHN,QUAN1B
        .GLOBL  TSXSIT,CFCHAN,NUCHN,MVSIZ,VQUN1C,VNRFLG
        .GLOBL  VDISPC,VDOSPC,VDMKTP,VSYDMP,VDMTCR,MODDAT
        .GLOBL  VNCSLO,VNCXOF,VNCXON,VCTRLT
        .GLOBL  CMFSEC,CMFTOP,VKEYMX,VSCHED,VDSKBU,MODTIM
        .GLOBL  VTSLCH,MXSPAC,VPMSIZ,VVLSCH,VQUANO,VQUAN3,VVPWCH
        .GLOBL  MXRBUF,MXRING,MXBRK,MH$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$QP
        .GLOBL  VMAXMC,VMXMSG,MSGBAS,USRBAS,VMXMRB,WINBAS
        .GLOBL  NUMDCD,VNUMDC,DCAGE,NUMCDB,VMIOBF
        .GLOBL  LOKBAS,LOKMEM,TIOBAS,LOKCSH
        .GLOBL  VQUAN1,VQUN1A,VQUN1B,VQUAN2,VCORTM
        .GLOBL  MAPPAR,RDB,RDBEND,NUMRDB,MIODBG
        .GLOBL  CSHDEV,CSHDVN,VMXCSH,VNFCSH,CSHHD
        .GLOBL  MAXALC,ALCTBL,ALCEND,SNDBX,USPLCH,UBUSMP,MEM256
        .GLOBL  VOFFTM,VONTM,VTMIN,VTMLOC,VTMOUT
        .GLOBL  FREFRK,BOTDEV,BOTUNI,BOTCSR,MIOFLG
        .GLOBL  AUTHAN,AHEND,SNBUX,UMSYTP,VINTIO
        .GLOBL  VMXSF,VMXSFC,VMLBLK,RSFBLK,VPLAS,SEGCHN
        .GLOBL  SDCBSZ,SDBULS,SPLANM,MIONWB,INDFIL
        .GLOBL  NDL,LSTDL,FSTDL,VSWPFL,MAPUSR,R$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,IDSFLG
```

```
                                 .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$WCT
                                 .GLOBL  CSHBFP,CSHLRU,CSHMRU,CSHFHD,CCBHD
                                 .GLOBL  CASTBR,CASCBR,CASTBW,CASCUP,CASTRO,CASTWO
                                 .GLOBL  CSHIO,CSHINI,CSHCLN,CSHFIN,CSHBAS,CSHVEC
                                 .GLOBL  LOKVEC,LOKINI,DOOPAP,DOCOPN,SFSVST,SFRSST,DORLK
                                 .GLOBL  DOTLK,DOCULK,DOULK1,DOSFCK,SFCLS,SFWRIT,CLSCDB
                                 .GLOBL  DCRD1,DCRD2,LOKVEC,CLKVEC,VUSPHN,ABRTOV
                                 .GLOBL  KMNSTK,KMNSTR,KMNPGS,KMNCHN
                                 .GLOBL  DATIML,DATIMH
                                 .GLOBL  CXTWDS,CXTPAG,CXTPDR,CXTRMN,CXTBUF,CXBBAS,CXBSIZ
                         ;
                         ;  Global references
                         ;
                                 .GLOBL  ININT,DLINT,LINNUM,PROITP,FNDHRB
                                 .GLOBL  SD$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
                         ;
        001200           TSXVRS  =       640.            ;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
        000123           MNUAOT  =       83.             ;Replaces TSEXC2 cell
        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
```

```
    230         000000                          CURMX   =       0               ;Current mux #
    231         000000                          NUMRDB  =       0               ;Count number of shared run-times declared
    232         000000                          CURCDX  =       CDX$DL          ;Comm device type for current line
    233         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.
                                ;
                                        ;Negative offsets from TSXVEC reserved to users
000000  002104'                 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  001200                          .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
```

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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
                                ;
                                ;  To force the system version number response to a particular version, set
                                ;  the version and update numbers below correspondingly.  If SYSVER is 0
                                ;  the version number will automatically be based on the monitor version
                                ;  from which TSX-Plus is started, with a cut-off based on the latest
                                ;  features actually supported (most particularly the EMTs implemented).
                                ;
000336     000                  SYSVER: .BYTE   0               ;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
```

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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
                                ;
001142  000000                  HNMEPT: .WORD   0
001144  000000                          .WORD   0
001146  000000                  HANRCO: .WORD   0
```

```
                                        ;------------------------------------------------------------------------------
                                        ;   Misc data cells
                                        ;
  001150  000002                        VQUANO:  .WORD   QUANO
  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                        VTMIN:   .WORD   TIMIN
  001216  000001                        VTMLOC:  .WORD   TIMLOC
  001220  000170                        VTMOUT:  .WORD   TIMOUT
  001222  000170                        VONTM:   .WORD   ONTIM
  001224  000074                        VOFFTM:  .WORD   OFFTIM
  001226  000005                        VMAXMC:  .WORD   MAXMC
  001230  000310                        VMSCHR:  .WORD   MSCHRS
  001232  000006                        VMXMSG:  .WORD   MAXMSG
  001234  000005                        VMXMRB:  .WORD   MAXMRB
  001236  000100                        VHIMEM:  .WORD   HIMEM
  001240  000100                        VDFMEM:  .WORD   DFLMEM
  001242  000012                        VSWPSL:  .WORD   SWPSLT          ;# of job slots in swap file
  001244  000764                        VPLAS:   .WORD   SEGBLK          ;# blocks for PLAS swap file
  001246  000014                        VNGR:    .WORD   NGR             ;Number of global PLAS regions
  001250  000000                        NDVRCB:  .WORD   DEVXMR          ;Number of PLAS regions for device handlers
  001252  000012                        VMXWIN:  .WORD   MAXWIN          ;Maximum number of display windows
  001254  000007                        VKEYMX:  .WORD   KEYMAX          ;Maximum # user-defined keys
  001256  000004                        VNUIP:   .WORD   NUIP            ;Number of user programs that may be INSTALLed
  001260  000454                        VCSHNB:  .WORD   CACHE           ;# blocks in use for generalized data cache
  001262  000454                        CSHALC:  .WORD   CACHE           ;# blocks allocated for generalized data cache
  001264  040150                        VNRFLG:  .WORD   NRMFLG          ;Default time-sharing line flags
  001266  000000                        VPMSIZ:  .WORD   PMSIZE          ;Bytes for performance monitor
  001270  000000G                       VSCHED:  .WORD   SCHED           ;An entry point in TSEXEC
  001272  000000G                       VDSKBU:  .WORD   DSKBUF          ;A global from TSINIT
  001274  000062                        VNCSLO:  .WORD   NCSILO          ;Default #bytes for TT and CL silos
  001276     014                        VNCXOF:  .BYTE   NCXOFF          ;Default XOFF when only this many free
  001277     004                        VNCXON:  .BYTE   NCXON           ;Default XON when this many remain
  001300  000276                        VDISPC:  .WORD   DINSPC          ;Default line input buffer size
  001302  000360                        VDOSPC:  .WORD   DOTSPC          ;Default line output buffer size
  001304  000000                        SYTIMH:  .WORD   0               ;High-order system time word
  001306  000000                        SYTIML:  .WORD   0               ;Low-order system time word
  001310  000000                        TK1SEC:  .WORD   0               ;# clock ticks per second
  001312  000000                        TK1VAL:  .WORD   0               ;# clock ticks per 0.1 second
  001314  000000                        TK1CNT:  .WORD   0
  001316  000000                        TK5VAL:  .WORD   0               ;# clock ticks per 0.5 seconds
  001320  000000                        TK3SVL:  .WORD   0               ;# clock ticsk per 3 seconds
```

```
     58 001322  000000                     TSXSIT:  .WORD   0
     59 001324  000000                     FRKDLY:  .WORD   0               ;Max clock ticks a fork request was delayed
     60 001326  000000                     CTRLTT:  .WORD   0               ;# of operator's console
     61 001330  000000                     MINTIM:  .WORD   0               ;Number of minutes of system up-time
     62 001332                             SEGCHN:  .BLKW   5               ;Channel block used for PLAS region swapping
     63 001344  000000                     KMNTOP:  .WORD   0               ;Abs address of top of TSKMON
     64 001346  000000                     KMNHI:   .WORD   0               ;KMNTOP-KMNBAS
     65 001350                             CCLSAV:  .BLKW   5               ;Savestatus for CCL.SAV file info
     66 001362                             INDSAV:  .BLKW   5               ;Savestatus for IND.SAV file info
     67 001374  000000                     INDDBL:  .WORD   0               ;Lowest block in IND.SAV file of data segmemt
     68 001376  000000                     INDDBS:  .WORD   0               ;Number of blocks in IND.SAV data segment
     69 001400  000000                     USRBAS:  .WORD   0               ;Phys 64-byte block # of TSUSR overlay
     70 001402  000000                     MSGBAS:  .WORD   0               ;Phys 64-byte block # of TSMSG overlay
     71 001404  000000                     WINBAS:  .WORD   0               ;Phys 64-byte block # of TSWIN overlay
     72 001406  000000                     LOKBAS:  .WORD   0               ;Phys 64-byte block # of TSLOCK overlay
     73 001410  000000                     CSHBAS:  .WORD   0               ;Phys address of TSCASH code
     74 001412  000000                     TIOBAS:  .WORD   0               ;Phys address of TSTIOX code
     75 001414  000000                     LOKMEM:  .WORD   0               ;Phys 64-byte block # of rec locking data area
     76 001416  000000                     LOKCSH:  .WORD   0               ;Phys 64-byte block # of shared file cache buf
     77 001420  000000                     NUMDCD:  .WORD   NUMDC           ;Num of shared file data cache entries
     78 001422  000144                     NUMCDB:  .WORD   MAXSFC          ;Number of free shared file channels
     79 001424  000000                     SNMSHD:  .WORD   0               ;Head of free list of system message buffers
     80 001426  000002                     NMUMB:   .WORD   <NMSNMB-NMSYMB> ;# message buffers available for user access
     81 001430  000000                     CSHHD:   .WORD   0               ;Head of directory cache list
     82 001432  000000                     MONFQH:  .WORD   0               ;Head of free list of monitor control blocks
     83 001434  000000                     MIOBHD:  .WORD   0               ;Head of mapped I/O control block list
     84 001436  000000                     MIOWHD:  .WORD   0               ;Head of mapped I/O wait block list
     85 001440  000000                     MIOSYQ:  .WORD   0               ;Pointer to 1st active mapped I/O wait block
     86 001442  000000                     SMONHD:  .WORD   0               ;Head of job monitoring requests for all jobs
     87 001444  000000                     SFCB:    .WORD   0               ;Start of spool file control block area
     88 001446  000000                     SFCBND:  .WORD   0               ;End of spool file control block area
     89 001450  000000                     SFCBFH:  .WORD   0               ;Head of free spool file control block list
     90 001452  000036                     NSPLFL:  .WORD   SPLNF           ;Number of spool files
     91 001454  000372                     NSPLBL:  .WORD   SNDBX           ;Number of blocks in spool file
     92 001456  000000                     NFRESB:  .WORD   0               ;Number of public spool file blocks
     93 001460  000000                     SHRRCB:  .WORD   0               ;Pointer to base of global RCB area
     94 001462  000000                     SHRRCN:  .WORD   0               ;Pointer to end of global RCB area
     95 001464  000000                     INSTBL:  .WORD   0               ;Pointer to base of INSTALL table
     96 001466  000000                     INSTBN:  .WORD   0               ;Pointer past end of INSTALL table
     97 001470  000000                     ABRTOV:  .WORD   0               ;Rad50 name of overlay during trap
     98 001472  000036                     VMXCSH:  .WORD   MAXCSH          ;Max number of cached devices
     99 001474  000000                     CSHDEV:  .WORD   0               ;Start of area with device cache blocks
    100 001476  000000                     CSHDVN:  .WORD   0               ;End of area with device cache blocks
    101 001500  000000                     SCPFHD:  .WORD   0               ;Head of free list of swap command packets
    102 001502  177777                     LDDEVX:  .WORD   -1              ;Device index number of "LD" device
    103 001504  177777                     CLDEVX:  .WORD   -1              ;Device index number of "CL" device
    104 001506  177777                     C1DEVX:  .WORD   -1              ;Device index number of "C1" device
    105 001510  000000  000000  000000     BOTDEV:  .WORD   0,0,0,0         ;Device spec for device being booted from
        001516  000000
    106 001520  000000                     BOTUNI:  .WORD   0               ;Unit # of device being booted from
    107 001522  000000                     BOTCSR:  .WORD   0               ;CSR of device being booted from
    108 001524  000000                     SPOLID:  .WORD   0               ;Last spool file ID number
    109 001526  000000                     UMSYTP:  .WORD   0               ;Address of top of unmapped system space
    110 001530  000001                     IOABFL:  .WORD   IOABT           ;1==>Do I/O abort, 0==>Do I/O wait
    111 001532  000000G                    DEFBAS:  .WORD   TSDEFS
    112 001534  114716                     SYNAME:  .RAD50  /XXN/           ;Actual name of SY physical device
    113 001536  075250  100020  101704     UCLNAM:  .RAD50  /SY TSXUCLSAV/  ;Name of TSXUCL program
```

```
        001544  073376
    114 001546  000000                  UCLBLK: .WORD   0               ;# blocks in TSXUCL data file for each job
    115 001550  075250  102405  057760  UKMNAM: .RAD50  /SY UKMON SAV/  ;Name of user-provided TSKMON command processr
        001556  073376
    116 001560  000000                  PIDPTR: .WORD   0               ;Pointer to clock-driven PI handler routine
    117 001562                          PROSLT: .BLKW   9.              ;ID # of device in each PRO option slot
    118 001604  000000                  VIDCSR: .WORD   0               ;Address of PRO video CSR
    119 001606  177564                  VDMTCR: .WORD   DMPTCR          ;Transmitter control reg addr for dump device
    120 001610  000000                  MODDAT: .WORD   0               ;Date last modified by TSXMOD
    121 001612  000000                  MODTIM: .WORD   0               ;Time (3-sec) last modified by TSXMOD
    122 001614  000000                  HANRCB: .WORD   0               ;Pointer to start of handler RCB area
    123                                 ;
    124                                 ;   Data for generalized data cache
    125                                 ;
    126 001616  000000                  CA$BLK: .WORD   0               ;Block number associated with cache entry
    127 001620  000000                  CA$DVU: .WORD   0               ;Device and unit # associated with entry
    128 001622  000000                  CA$WCT: .WORD   0               ;Number of words in entry
    129 001624  000000                  CA$UFL: .WORD   0               ;LRU chain forward link
    130 001626  000000                  CA$UBL: .WORD   0               ;LRU chain backward link
    131 001630  000000                  CA$HFL: .WORD   0               ;Hash chain forward link
    132 001632  000000                  CA$HBL: .WORD   0               ;Hash chain backward link
    133 001634  000000                  CA$HSH: .WORD   0               ;Hash chains list head vector
    134 001636  000000                  CSHBFP: .WORD   0               ;64-byte block number of buffer area
    135 001640  000000                  CSHLRU: .WORD   0               ;Pointer to least-recently-used entry
    136 001642  000000                  CSHMRU: .WORD   0               ;Pointer to most-recently-used entry
    137 001644  000000                  CSHFHD: .WORD   0               ;Head of cache block free list
    138 001646  000000                  CCBHD:  .WORD   0               ;Head of cache control block free list
    139 001650  000000  000000          CASTRD: .WORD   0,0             ;Total # reads from mounted devices
    140 001654  000000  000000          CASTBR: .WORD   0,0             ;Total # blocks read from mounted devices
    141 001660  000000  000000          CASCBR: .WORD   0,0             ;Number of blocks that were read from cache
    142 001664  000000  000000          CASTWO: .WORD   0,0             ;Total # writes to mounted devices
    143 001670  000000  000000          CASTBW: .WORD   0,0             ;Total # blocks written to mounted devices
    144 001674  000000  000000          CASCUP: .WORD   0,0             ;Number of blocks moved into data cache
    145                                 ;   Entry point vector for caching module
    146 001700                          CSHVEC:
    147 001700  000000                  CSHINI: .WORD   0               ;-
    148 001702  000000                  CSHIO:  .WORD   0               ;-
    149 001704  000000                  CSHCLN: .WORD   0               ;-
    150 001706  000000                  CSHFIN: .WORD   0               ;-
    151 001710  177777                          .WORD   -1              ;- End of pointer vector
    152                                 ;
    153                                 ;   Entry point vector for record locking module
    154                                 ;
    155 001712                          LOKVEC:
    156 001712  000000                  LOKINI: .WORD   0               ;-
    157 001714  000000                  DOOPAP: .WORD   0               ;-
    158 001716  000000                  DOCOPN: .WORD   0               ;-
    159 001720  000000                  SFSVST: .WORD   0               ;-
    160 001722  000000                  SFRSST: .WORD   0               ;-
    161 001724  000000                  DORLK:  .WORD   0               ;-
    162 001726  000000                  DOTLK:  .WORD   0               ;-
    163 001730  000000                  DOCULK: .WORD   0               ;-
    164 001732  000000                  DOULK1: .WORD   0               ;-
    165 001734  000000                  DOSFCK: .WORD   0               ;-
    166 001736  000000                  SFCLS:  .WORD   0               ;-
    167 001740  000000                  SFWRIT: .WORD   0               ;-
    168 001742  000000                  CLSCDB: .WORD   0               ;-
```

```
001744  000000                  DCRD1:  .WORD   0               ;-
001746  000000                  DCRD2:  .WORD   0               ;-
001750  177777                          .WORD   -1              ;- End of pointer vector
                                ;
                                ;  Misc byte data
                                ;
001752     000                  VSYDMP: .BYTE   SYSDMP          ;Generate dump on crash if non-zero
001753     000                  VDMKTP: .BYTE   DMPKTP          ;Crash on any kernel trap if non-zero
001754     001                  VSWPFL: .BYTE   SWAPFL
001755     001                  VBUSTP: .BYTE   BUSTYP
001756     000                  VINABT: .BYTE   INIABT
001757     000                  VUXIFL: .BYTE   UXIFLG
001760     001                  VU$CL:  .BYTE   U$CL
001761     002                  VUCLOR: .BYTE   UCLORD
001762     001                  VLDSYS: .BYTE   LDSYS
001763     001                  VSLEDT: .BYTE   SLEDIT
001764     000                  VDBFLG: .BYTE   DBGFLG
001765     023                  VPRILO: .BYTE   PRILOW
001766     120                  VPRIHI: .BYTE   PRIHI
001767     062                  VPRIDF: .BYTE   PRIDEF
001770     012                  VPRIVR: .BYTE   PRIVIR
001771     035                  VTSLCH: .BYTE   TSLICH
001772     027                  VVLSCH: .BYTE   VLSWCH
001773     002                  VVPWCH: .BYTE   PWCH
001774     034                  VCXTRM: .BYTE   CCXTRM
001775     001                  VCXCTL: .BYTE   CCXCTL
001776     024                  VCTRLT: .BYTE   STATCH
001777     003                  VEDIT:  .BYTE   EDITOR
002000     000                  VMIOBF: .BYTE   MIONBF
002001     017                  VMIOSZ: .BYTE   MIOBSZ
002002     000                  VUSPHN: .BYTE   PHONE           ;0=local if no DCD;1=always mon DCD if $phone
002003     123                  VMNUAO: .BYTE   MNUAOT
002004     000                  MAPUSR: .BYTE   0               ;Number of job memory mapping is set up for
002005     000                  LINNUM: .BYTE   0
002006     000                  MUXNUM: .BYTE   0
002007     000                  NUMON:  .BYTE   0
002010     000                  PVON:   .BYTE   0
002011     000                  TOTON:  .BYTE   0
002012     000                  PROFLG: .BYTE   0               ;Non-zero ==> Running on PRO-350
002013     000                  STPFLG: .BYTE   0
002014     000                  UBUSMP: .BYTE   0               ;1==>Do Unibus mapping
002015     000                  SR3FLG: .BYTE   0               ;NON-ZERO==>MEMORY MANAGEMENT REG 3 PRESENT
002016     000                  IDSFLG: .BYTE   0               ;Non-zero==>machine implements D-space
002017     000                  MEM256: .BYTE   0               ;Non-zero==>machine has at least 256kb
002020     000                  MIOFLG: .BYTE   0               ;Non-zero==>I/O mapping needed for some device
002021     000                  NSPLDV: .BYTE   0               ;Number of installed spooled devices
002022     001                  KMONCE: .BYTE   1               ;Kmon initialization flag
002023     000                  EXCJOB: .BYTE   0               ;Index of job with exclusive access
002024     000                  DOSCHD: .BYTE   0               ;Scheduler needs to be called
002025     000                  CLVERS: .BYTE   CLVRSN          ;CL handler version number
002026     000                  LDVERS: .BYTE   0               ;LD translation table format (1<RTV5.4=<2)
002027     041     200          SYPSPR: .ASCII  /!/<200>        ;Prompt for system password
                                        .EVEN
                                ;  System time counters
002032  000000                  TMTOTH: .WORD   0               ;Total uptime (0.1 second units)
002034  000000                  TMTOTL: .WORD   0
002036  000000                  TMUSRH: .WORD   0               ;Time spent in user jobs
```

```
002040   000000            TMUSRL: .WORD   0
002042   000000            TMSWTH: .WORD   0               ;Swap-wait time
002044   000000            TMSWTL: .WORD   0
002046   000000            TMIOH:  .WORD   0               ;Time user i/o is active
002050   000000            TMIOL:  .WORD   0
002052   000000            TMSWPH: .WORD   0               ;Time swapping is active
002054   000000            TMSWPL: .WORD   0
002056   000000            TMIOWH: .WORD   0               ;Time system is doing i/o-wait
002060   000000            TMIOWL: .WORD   0
002062   000000            TMIDLH: .WORD   0               ;Idle time
002064   000000            TMIDLL: .WORD   0
002066   000000            DATIML: .WORD   0
002070   000000            DATIMH: .WORD   0
                           ;
                           ;  Shared file data cache statistics counters
                           ;
002072   000000            DCTOTU: .WORD   0               ;Total number of cache hits since last divisn
002074   000000            DCTRD:  .WORD   0               ;Total number of reads from shared files
002076   000000            DCCRD:  .WORD   0               ;Number of reads satisfied by data in cache
002100   000000            DCTWR:  .WORD   0               ;Total number of writes to shared files
002102   000000            DCCWR:  .WORD   0               ;Number of writes that update cache
                           ;
002104   000000            NUMDEV: .WORD   0               ;Byte index to last entry in device tables
002106   000000            FREIOQ: .WORD   0               ;Head of i/o queue element chain
                           ;
                           ;  Define mux tables for DZ11's and DH11's.
                           ;
                                   .MACRO  MXTBL   NAME
                                   .NLIST
                           NAME    =       .-2
                                   .GLOBL  NAME
                                   .REPT   MAXMUX
                                   .WORD   0
                                   .ENDR
                                   .LIST
                                   .ENDM   MXTBL
                           ;
002110                             MXTBL   MXTYPE          ;DZ11 & DH11 type of mux (CDX$DZ or CDX$DH)
002112                             MXTBL   MXCSR           ;DZ11 Control Status Register
002114                             MXTBL   MXLPR           ;DZ11 Line Parameter Register
002116                             MXTBL   MXTCR           ;DZ11 Transmit Control Register
002120                             MXTBL   MXDTR           ;DZ11 Data Terminal Ready
002122                             MXTBL   MXTBUF          ;DZ11 Transmitter Buffer Register
002124                             MXTBL   MXSBRK          ;DZ11 Shadow register for hardware BRK reg.
002126                             MXTBL   MXCAR           ;DZ11 Carrier Detect
002130                             MXTBL   MXVEC           ;DZ11 & DH11 Vector address
002132                             MXTBL   MXLNT           ;DZ11 & DH11 Addr of table to map mux # to Lin
002134                             MXTBL   MH$BRK          ;DH11 Break control register
002136                             MXTBL   MH$LPR          ;DH11 Line Parameter Register
002140                             MXTBL   MH$PBR          ;DH11 Previous value of BAR register
002142                             MXTBL   DM$CSR          ;DH11(DM11) Control Status Register
002144                             MXTBL   DM$LSR          ;DH11(DM11) Line Status Register
002146                             MXTBL   DM$VEC          ;DH11(DM11) Address of DM11 interrupt vector
         002112'           MXRBUF  =       MXLPR           ;DZ11 Receiver Buffer Register
         002120'           MXRING  =       MXTBUF          ;DZ11 Ring indicator flags
         002124'           MXBRK   =       MXCAR           ;DZ11 Break control flags
                           ;  Equates for DH11 control registers
```

```
    283         002110'                        MH$SCR  =       MXCSR           ;DH11 System Control Register
    284         002112'                        MH$RCR  =       MXRBUF          ;DH11 Received Character Register
    285         002114'                        MH$CAR  =       MXTCR           ;DH11 Current Address Register
    286         002116'                        MH$BCR  =       MXDTR           ;DH11 Byte Count Register
    287         002120'                        MH$BAR  =       MXTBUF          ;DH11 Buffer Active Register
    288         002124'                        MH$SSR  =       MXCAR           ;DH11 Silo Status Register
    289                                        ;  Equates for DHV11 control registers
    290         002110'                        VH$CSR  =       MH$SCR          ;DHV11 Control and Status Register
    291         002112'                        VH$DBR  =       MH$RCR          ;DHV11 Data Buffer Register
    292         002134'                        VH$LPR  =       MH$LPR          ;DHV11 Line Parameter Register
    293         002142'                        VH$LSR  =       DM$LSR          ;DHV11 Line Status Register
    294         002140'                        VH$LCR  =       DM$CSR          ;DHV11 Line Control Register
    295         002114'                        VH$BA1  =       MH$CAR          ;DHV11 Buffer Address register 1
    296         002124'                        VH$BA2  =       MH$SSR          ;DHV11 Buffer Address register 2
    297         002116'                        VH$BCR  =       MH$BCR          ;DHV11 Byte Count Register
    298                                        ;
    299                                        ;  Generate FORK request blocks.
    300                                        ;
    301 002150  002154'                        FREFRK: .WORD   FRKLST          ;Head of free list
    302 002152  000000                         FRKINI: .WORD   0               ;Pointer to fork blocks in init area
    303 002154                                 FRKLST:
    304         000004                                 .REPT   FRKGEN          ;Gen in a few static fork blocks
    305                                                .WORD   .+22.           ;Link to next block in free list
    306                                                .WORD   0,0,0,0,0,0,0,0,0
    307                                                .ENDR
    308 002304  000000  000000  000000                 .WORD   0,0,0,0,0,0,0,0,0,0,0 ;Last block with 0 forward link
        002312  000000  000000  000000
        002320  000000  000000  000000
        002326  000000  000000
    309                                        ;
    310                                        ;  Symbolic equates for QBUS and UNIBUS machines.
    311                                        ;
    312         000001                         QBUS    =       1
    313         000000                         UNIBUS  =       0
    314                                        ;
    315                                        ;  Generate the memory size limit checking certain restrictions.
    316                                        ;  On non-extended machines, allow 256.Kb - 8.Kb I/O page
    317                                        ;  On extended machines, allow 4096.Kb - 256.Kb I/O page
    318                                        ;
    319                                                .MACRO  MEMORY  SIZE
    320                                                SIZMEM  = SIZE
    321                                                .IF     LE, SIZMEM
    322                                                        SIZMEM = 3840.
    323                                                .ENDC
    324                                                .IF     GT, SIZMEM-3840.
    325                                                        SIZMEM = 3840.
    326                                                .ENDC
    327                                                .IF     LT, <SIZMEM - 96.>
    328                                        .ERROR  ;Memory size limit too small for running TSX-Plus
    329                                                .ENDC
    330                                        ;  Allocate the memory size to examine.
    331                                                .WORD   SIZMEM*20
    332                                                .ENDM   MEMORY
    333                                        ;
    334                                        ;  Memory management tables
    335                                        ;
    336 002332                                 MAPSIZ: MEMORY  MEMSIZ          ;PAR value of physical memory cutoff
```

```
002334  000000          BASMAP: .WORD   0               ;Pointer to base of memory map table
002336  000000          LOMAP:  .WORD   0               ;Pointer to 1st user page in MEMMAP
002340  000000          HIMAP:  .WORD   0               ;Pointer above top user page in memmap
002342  000000          MAPPAR: .WORD   0               ;Value to map PAR 5 to mem allocation table
002344  000000          FREPGS: .WORD   0               ;# free pages
002346  000000          JCXPGS: .WORD   0               ;# pages needed for job context block
002350  000000          MXJMEM: .WORD   0               ;Max # K-bytes a job may use
002352  000000          DFJMEM: .WORD   0               ;Default # K-bytes a job may use
002354  000000          MXJADR: .WORD   0               ;Address above top of largest job space
002356  000000          SMRSIZ: .WORD   0               ;# 64-byte blocks allocated to system overlays
002360  000000          MHNSIZ: .WORD   0               ;# 64-byte blocks allocated for mapped handler
002362  000000          SRTSIZ: .WORD   0               ;# 64-byte blocks allocated for shared run-tim
002364  000000          CSHSIZ: .WORD   0               ;# 64-byte blocks allocated for data cache
                        ;
                        ;   Information on KMON position and size.
                        ;
002366  000000          KMNSTK: .WORD   0               ;Address of Kmon stack
002370  000000          KMNSTR: .WORD   0               ;Starting address of Kmon
002372  000000          KMNPGS: .WORD   0               ;# 256-word memory pages needed to run TSKMON
002374                  KMNCHN: .BLKW   5               ;Save status for Kmon file channel
                        ;
                        ;   Information about job context region.
                        ;
002406  000000          CXTWDS: .WORD   0               ;# words for job context block
002410  000000          CXTPAG: .WORD   0               ;# 512-byte pages for job context block
002412  000000          CXTPDR: .WORD   0               ;PDR value to map job context block
002414  000000          CXTRMN: .WORD   0               ;Address in context area of simulated RMON
002416  000000          CXTBUF: .WORD   0               ;Addr of buffer used for accessing cxt blk
002420  000000          CXBBAS: .WORD   0               ;Addr of data currently in CXTBUF
002422  000000          CXBSIZ: .WORD   0               ;Amt of data currently in CXTBUF
                        ;
                        ;   Start a CSECT to hold shared run-time descriptor blocks
                        ;
000000                          .CSECT  RDBSEC          ;CSECT for RDB entries
000000                  RDBSEC:
000000                  RDB:                            ;Define base of RDB entries
002424                          .CSECT  TSGEN           ;Go back to standard TSGEN CSECT
                        ;
                        ;   Symbolic equates for system editor names.
                        ;   Note these equates must match those in TSDEFS.
                        ;
        000001          EDIT    =       1
        000002          TECO    =       2
        000003          KED     =       3
        000004          K52     =       4
                        ;
                        ;   Symbolic equates for UCL order
                        ;
        000001          FIRST   =       1
        000002          MIDDLE  =       2
        000003          LAST    =       3
                        ;
                        ;   Symbolic names used to define line transmit/receive speeds.
                        ;
        000000          S50     =       0               ;50     baud
        000001          S75     =       1               ;75     baud
        000002          S110    =       2               ;110    baud
        000003                  S134.5  =       3               ;134.5 baud
        000004                  S150    =       4               ;150   baud
        000005                  S300    =       5               ;300   baud
        000006                  S600    =       6               ;600   baud
        000007                  S1200   =       7               ;1200  baud
        000010                  S1800   =       10              ;1800  baud
        000011                  S2000   =       11              ;2000  baud
        000012                  S2400   =       12              ;2400  baud
        000013                  S3600   =       13              ;3600  baud
        000014                  S4800   =       14              ;4800  baud
        000015                  S7200   =       15              ;7200  baud
        000016                  S9600   =       16              ;9600  baud
        000017                  S19200  =       17              ;19200 baud
                                ;
                                ;  Symbolic names for parity codes
                                ;
        040000                  EVEN    =       040000          ;Even parity
        140000                  ODD     =       140000          ;Odd parity
        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
```

```
    115                                     .ENDC   ;GT,L
    116                                     .CSECT  DNAME
    117                             AHEND:
    118                                     .CSECT  TSGEN
    119                                     .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
```

```
                OB      LCPULO          ;Low-order CPU time
                OB      LCONTM          ;Connect time
                OBP     LCDTIM          ;Lost-carrier disconnect time
                OBP     LOFFTM          ;Allowed logoff time before DTR drop for line
                OBP     LABTIM          ;Autobaud control timer
                OB      LRDTIM          ;TT read timeout
                OB      LRTCHR          ;TT read timeout activation character
                OB      LSLEPL          ;.TWAIT sleep time for job (low-order)
                OB      LSLEPH          ;.TWAIT sleep time for job (high-order)
                OBH     LMXNUM          ;Index # of mux controlling line
                OBH     LMXPRM          ;Line parameters (speed, parity, stop bits)
                OB      LPRG1           ;1st 3 chars of running program name (rad50)
                OB      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 ;0 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:
002424                 .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:
002424                  .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  0;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:
002424                  .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$DH          ;Lines within this block are connected to DH11
DHUSE   =       1               ;Set flag saying DH11 support is needed
        VECCHK  AVEC,7
        SRCHK   ACSR
        .IF     NE,ADMVEC
        VECCHK  ADMVEC,3
        .ENDC
        .IF     NE,ADMADR
        SRCHK   ADMADR
        .ENDC
S       =       .
.       =       MXTYPE+CURMX    ;Type of multiplexor
        .WORD   CDX$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
```

```
                                   .        =       S
                                           .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
```

```
     58                                        DHVDEF  AVEC,ACSR        ;Handle same as DHV11
     59                                        .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
```

```
                                ;----------------------------------------------------------------
                                ;  Symbolic equates for F (FI AGPAGE), N (NOFLAGPAGE,NOHOLD,NARROW),
                                ;  W (WIDE) and H (HOLD) In SPFLAG, SPWIDE, and SPHOLD macros.
                                ;
         001000                 F       =       1000
         000000                 N       =       0
         002000                 W       =       2000
         000040                 H       =       40
                                ;
                                ;  Init the values to hold flag page, wide, and hold flags.
                                ;
         000000                 F1      =       0
         000000                 F2      =       0
         000000                 F3      =       0
         000000                 F4      =       0
         000000                 F5      =       0
         000000                 F6      =       0
         000000                 F7      =       0
         000000                 F8      =       0
         000000                 F9      =       0
         000000                 F10     =       0
         000000                 F11     =       0
         000000                 F12     =       0
         000000                 F13     =       0
         000000                 F14     =       0
         000000                 F15     =       0
         000000                 F16     =       0
         000000                 F17     =       0
         000000                 F18     =       0
         000000                 F19     =       0
         000000                 F20     =       0
         000000                 F21     =       0
         000000                 F22     =       0
         000000                 F23     =       0
         000000                 F24     =       0
         000000                 F25     =       0
         000000                 F26     =       0
         000000                 F27     =       0
         000000                 F28     =       0
         000000                 F29     =       0
         000000                 F30     =       0
                                ;
                                ;  Define the default for each spooled device as to whether or not
                                ;  flag pages will be the default for that device.  This macro must
                                ;  be executed prior to the execution of the SPWIDE macro, the SPHOLD
                                ;  macro, and the SPOOL macro.
                                ;
                                        .MACRO  SPFLAG  A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,AA,BB,CC,DD
                                        .IIF NB,<A>     F1 = <A>
                                        .IIF NB,<B>     F2 = <B>
                                        .IIF NB,<C>     F3 = <C>
                                        .IIF NB,<D>     F4 = <D>
                                        .IIF NB,<E>     F5 = <E>
                                        .IIF NB,<F>     F6 = <F>
                                        .IIF NB,<G>     F7 = <G>
                                        .IIF NB,<H>     F8 = <H>
                                        .IIF NB,<I>     F9 = <I>
```

```
                .IIF NB,<J>     F10 = <J>
                .IIF NB,<K>     F11 = <K>
                .IIF NB,<L>     F12 = <L>
                .IIF NB,<M>     F13 = <M>
                .IIF NB,<N>     F14 = <N>
                .IIF NB,<O>     F15 = <O>
                .IIF NB,<P>     F16 = <P>
                .IIF NB,<Q>     F17 = <Q>
                .IIF NB,<R>     F18 = <R>
                .IIF NB,<S>     F19 = <S>
                .IIF NB,<T>     F20 = <T>
                .IIF NB,<U>     F21 = <U>
                .IIF NB,<V>     F22 = <V>
                .IIF NB,<W>     F23 = <W>
                .IIF NB,<X>     F24 = <X>
                .IIF NB,<Y>     F25 = <Y>
                .IIF NB,<Z>     F26 = <Z>
                .IIF NB,<AA>    F27 = <AA>
                .IIF NB,<BB>    F28 = <BB>
                .IIF NB,<CC>    F29 = <CC>
                .IIF NB,<DD>    F30 = <DD>
                .ENDM   SPFLAG
        ;
        ;  Define the default for each spooled device as to whether or not
        ;  flag pages will be centered based on a 132 columned or 80 columned
        ;  page.  This macro must be executed after the execution of the SPFLAG
        ;  macro, and prior to the execution of the SPOOL macro.
        ;
                .MACRO  SPWIDE  A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,AA,BB,CC,DD
                .IIF NB,<A>     F1 = F1 ! <A>
                .IIF NB,<B>     F2 = F2 ! <B>
                .IIF NB,<C>     F3 = F3 ! <C>
                .IIF NB,<D>     F4 = F4 ! <D>
                .IIF NB,<E>     F5 = F5 ! <E>
                .IIF NB,<F>     F6 = F6 ! <F>
                .IIF NB,<G>     F7 = F7 ! <G>
                .IIF NB,<H>     F8 = F8 ! <H>
                .IIF NB,<I>     F9 = F9 ! <I>
                .IIF NB,<J>     F10 = F10 ! <J>
                .IIF NB,<K>     F11 = F11 ! <K>
                .IIF NB,<L>     F12 = F12 ! <L>
                .IIF NB,<M>     F13 = F13 ! <M>
                .IIF NB,<N>     F14 = F14 ! <N>
                .IIF NB,<O>     F15 = F15 ! <O>
                .IIF NB,<P>     F16 = F16 ! <P>
                .IIF NB,<Q>     F17 = F17 ! <Q>
                .IIF NB,<R>     F18 = F18 ! <R>
                .IIF NB,<S>     F19 = F19 ! <S>
                .IIF NB,<T>     F20 = F20 ! <T>
                .IIF NB,<U>     F21 = F21 ! <U>
                .IIF NB,<V>     F22 = F22 ! <V>
                .IIF NB,<W>     F23 = F23 ! <W>
                .IIF NB,<X>     F24 = F24 ! <X>
                .IIF NB,<Y>     F25 = F25 ! <Y>
                .IIF NB,<Z>     F26 = F26 ! <Z>
                .IIF NB,<AA>    F27 = F27 ! <AA>
                .IIF NB,<BB>    F28 = F28 ! <BB>
        .IIF NB,<CC>    F29 = F29 ! <CC>
        .IIF NB,<DD>    F30 = F30 ! <DD>
        .ENDM   SPWIDE
;
;  Define the default for each spooled device as to whether or not
;  spool files are to be eligible to be started as soon as they are
;  created.  This macro must be executed after the execution of the
;  SPFLAG macro, and proir to the execution of the SPOOL macro.
;
        .MACRO  SPHOLD  A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,AA,BB,CC,DD
        .IIF NB,<A>     F1 = F1 ! <A>
        .IIF NB,<B>     F2 = F2 ! <B>
        .IIF NB,<C>     F3 = F3 ! <C>
        .IIF NB,<D>     F4 = F4 ! <D>
        .IIF NB,<E>     F5 = F5 ! <E>
        .IIF NB,<F>     F6 = F6 ! <F>
        .IIF NB,<G>     F7 = F7 ! <G>
        .IIF NB,<H>     F8 = F8 ! <H>
        .IIF NB,<I>     F9 = F9 ! <I>
        .IIF NB,<J>     F10 = F10 ! <J>
        .IIF NB,<K>     F11 = F11 ! <K>
        .IIF NB,<L>     F12 = F12 ! <L>
        .IIF NB,<M>     F13 = F13 ! <M>
        .IIF NB,<N>     F14 = F14 ! <N>
        .IIF NB,<O>     F15 = F15 ! <O>
        .IIF NB,<P>     F16 = F16 ! <P>
        .IIF NB,<Q>     F17 = F17 ! <Q>
        .IIF NB,<R>     F18 = F18 ! <R>
        .IIF NB,<S>     F19 = F19 ! <S>
        .IIF NB,<T>     F20 = F20 ! <T>
        .IIF NB,<U>     F21 = F21 ! <U>
        .IIF NB,<V>     F22 = F22 ! <V>
        .IIF NB,<W>     F23 = F23 ! <W>
        .IIF NB,<X>     F24 = F24 ! <X>
        .IIF NB,<Y>     F25 = F25 ! <Y>
        .IIF NB,<Z>     F26 = F26 ! <Z>
        .IIF NB,<AA>    F27 = F27 ! <AA>
        .IIF NB,<BB>    F28 = F28 ! <BB>
        .IIF NB,<CC>    F29 = F29 ! <CC>
        .IIF NB,<DD>    F30 = F30 ! <DD>
        .ENDM   SPHOLD
;
;  The following 3 macros are used within the SPOOL macro to make it
;  possible for the user to set or not to set the flag page, flag page
;  centering, and spool hold flags on a per device basis.
;
        .MACRO  BLANK   NUM
            .WORD       F'NUM           ;SDFLAG
        .ENDM   BLANK

        .MACRO  NOT     NUM
            .WORD       F'NUM & ^CH     ;SDFLAG
        .ENDM   NOT

        .MACRO  OR      NUM
            .WORD       F'NUM ! H       ;SDFLAG
        .ENDM
```

```
;-----------------------------------------------------
;  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:
        C = 0
        .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
        C = C + 1
        .IF     B,SHLD
          BLANK \C
        .IFF
          .IF   EQ,SHLD
            NOT \C
          .IFF
            OR  \C
          .ENDC
        .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).
                                ;
002424  075250  100020  075150  SWDBLK: .RAD50  /SY TSXSWPTSX/
002432  100020
                                ;
                                ;  Spool file device-file specification (do not place on VM).
                                ;
002434  075250  100020  074514  SPLBLK: .RAD50  /SY TSXSPLTSX/
002442  100020
                                ;
                                ;  PLAS region swap file specification (do not place on VM).
                                ;
002444  075250  100020  071576  RSFBLK: .RAD50  /SY TSXRSFTSX/
002452  100020
                                ;
                                ;  File spec for file used to hold user defined command definitions (UCL)
                                ;
002454  075250  100020  101704  UCLDAT: .RAD50  /SY TSXUCLTSX/
002462  100020
                                ;
                                ;  File spec for temp file used while processing IND command files
                                ;
002464  075250  100020  035164  INDFIL: .RAD50  /SY TSXINDTSX/
002472  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.  It is valid to use either the
                                 ;  transmitter or receiver CSR.
                                 ;  Specify 177560 or 177564 to dump on the console terminal.
                                 ;  Specify 177510 or 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.
                                ;
002474                                  SYSPS   <TSX>   ;System password for all lines with $SYSPS
                                ;
                                ;  Amount of time a phone job is allowed to be active without
                                ;  establishing carrier after its ring has been answered (by raising
                                ;  DTR).  After this time interval the job is automatically logged off.
                                ;  Specify in 0.5 second units. This timer is inoperative if set to 0.
                                ;
        000170                  TIMIN   =       120.    ;Sixty seconds for normal modem connection
                                ;
                                ;  Amount of time that carrier may be lost during a normal phone
                                ;  connection. If carrier is re-established within the time interval
                                ;  then the counter is reset. If carrier is continuously absent for
                                ;  this interval, then the job is automatically logged off.
                                ;  Specify in 0.5 second units. This timer is inoperative if set to 0.
                                ;
        000170                  TIMOUT  =       120.    ;Five seconds of lost carrier
                                ;
                                ;  Amount of time that a phone job may be connected as an apparent local
                                ;  job (never generated the ring signal) without establishing carrier.
                                ;  After this time interval, the job is automatically logged off. (cf. PHONE)
                                ;  Specify in 0.5 second units. This timer is inoperative if set to 0.
                                ;
        000001                  TIMLOC  =       1.      ;Normally disallow this case
                                ;
                                ;  Amount of time that a phone connection will be maintained after a job
                                ;  has logged off.  After this time the DTR signal will be dropped,
                                ;  causing the phone to be hung up.
                                ;  Specify in 0.5 second units. This timer is inoperative if set to 0.
                                ;
        000074                  OFFTIM  =       60.     ;Allow two seconds to log back on
                                ;
                                ;  Amount of time a after a ring is answered (by raising DTR) that a
                                ;  phone connection will be maintained if carrier is not detected.  After
                                ;  this time the DTR signal will be dropped, causing the phone to be hung up.
                                ;  Specify in 0.5 second units. This timer is inoperative if set to 0.
                                ;
        000170                  ONTIM   =       120.    ;Allow up to 1 min for modems to connect
                                ;
                                ;  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 TIMLOC parameter determines how
                                ;  long a phone line may be active without establishing carrier.
                                ;  If you want a phone job which does not establish carrier to be
                                ;  treated as a local line, set PHONE to 0. If you want an active
                                ;  phone job which does not establish carrier within TIMLOC*0.5 sec
                                ;  to be killed, set PHONE to 1.
                                ;
        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 generate a line
                                ;  of status information on the terminal.  Note that the information
                                ;  is displayed like the SEND command and is not managed by the
                                ;  Process Windowing system -- it goes away on screen refresh.
                                ;
        000024                  STATCH  =       024     ;Octal 24 = control-T
                                ;
                                ;  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.   **
                              ;       ************************************
                              ;
002522                                DEVBEG          ;Beginning of device definitions

002522                                DEVDEF  <DW>            ;Pro hard disk
002522                                DEVDEF  <DZ>            ;Pro floppy disk
002522                                DEVDEF  <NL>            ;Null handler
002522                                DEVDEF  <ZZ>,MAPH       ;DBL security handler
002522                                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.
                              ;
        000000                DEVXMR  =       0.      ;Number of XM regions for device handlers

                              ;--------------------------------------------------------------------------
                              ;  SPFLAG allows you to specify whether or not you wish individual
                              ;  spooled devices to print a flag page before each file.  This macro
                              ;  defines the initial settings, which may be later changed with the
                              ;  SPOOL dev,[NO]FLAGPAGE keyboard command.  The initial setting is
                              ;  specified by selecting "F" for FLAGPAGE or "N" for NOFLAGPAGE.
                              ;  Each "F" or "N" must correspond to the respective device in the
                              ;  list of device names in the SPOOL macro.  For example:
                              ;
                              ;       SPFLAG  F,N
                              ;
                              ;  would enable flag pages for the first device and disable them for the
                              ;  second device specified in the SPOOL macro. As an example, with the
                              ;  following SPOOL macro:
                              ;
                              ;       SPOOL   2,20.,3,2000.,<LP CL2>,0,5.
                              ;
                              ;  flag pages would be initially enabled for LP and disabled for CL2.
                              ;
002522                                SPFLAG  F,N
```

```

                ;--------------------------------------------------------------------------
                ;  SPWIDE allows you to specify the default width to be used for centering
                ;  flagpages on individual spooled devices.  This is done by specifing
                ;  "W" for WIDE (132 column centering), or "N" for NARROW (80 column
                ;  centering).  Each "W" or "N" must correspond to the respective device
                ;  in the list of device names in the SPOOL macro.  For example in:
                ;
                ;       SPWIDE  W,N
                ;
                ;  where the SPOOL macro looks like:
                ;
                ;       SPOOL   2,20.,3,2000.,<LP CL2>,0,5.
                ;
                ;  flag pages printed on LP will be centered on 132 columns, whereas flag
                ;  pages printed on CL2 will be centered on 80 columns.  Note that the
                ;  only choice is between 80 and 132 column centering, no other widths
                ;  are supported.  The initial setting may be changed later with the
                ;  SPOOL dev,WIDE and SPOOL dev,NARROW keyboard commands.
                ;
002522                  SPWIDE  W,N

                ;--------------------------------------------------------------------------
                ;  SPHOLD allows you to specify whether or not spool files may be started
                ;  printing as soon as they are created or should be held until the output
                ;  channel is closed.  This is specified by selecting "H" for HOLD if they
                ;  are to be held until the channel is closed, or "N" for NOHOLD if spool
                ;  files may be started printing as soon as they are created.  Each "H" or
                ;  "N" must correspond to the respective device in the list of device
                ;  names in the SPOOL macro.  For example in:
                ;
                ;       SPHOLD  H,N
                ;
                ;  where the SPOOL macro looks like:
                ;
                ;       SPOOL   2,20.,3,2000.,<LP CL2>,,5.
                ;
                ;  spooled device LP will hold files from being printed until the channel
                ;  is closed, whereas spooled device CL2 will allow files to start printing
                ;  as soon as they are created.  The SPOOL dev,[NO]HOLD keyboard command
                ;  may be used later to change the initial settings.
                ;
002522                  SPHOLD  N,H

                ;----------------------------------------------------------------------------
                ;  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. This parameter specifies for all
                ;        devices the same characteristic as selected by the SPHOLD macro.
```

```
                                ;          If you wish to specify hold/nohold on an individual device basis,
                                ;          using the SPHOLD macro, then this parameter should be blank (,,)
                                ;          If a value is specified, it will override all the SPHOLD selections.
                                ;       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.
                                ;
002522                                  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 CBR064SHR>,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.
                                ;
        000006                  CLXTRA  =       6.      ;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
       002000                           $ALTER  =       2000    ;ON==>Allow .GTLIN to receive ! and activate on ^C
       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.
                                ;
002736                                  TBLDEF  7.,3.,2.,0.     ;# Real, # Subprocess, # Detached, # CL lines

                                ;
                                ;   Define primary (real) time-sharing lines
                                ;
010066                                  LINDEF  60,177560,OPER  ;Use console terminal as t/s term
010066                                  NAME    <Console>
010066                                  CMDFIL  LINE1.TSX
010066                                  TRMTYP  VT100
010066                                  FLAGS   NRMFLG!$START!$SCOPE!$TAB
010066                                  LINEND

010106                                  LINDEF  220,173400      ;Printer port
010106                                  NAME    <Printer port>
010106                                  FLAGS   NRMFLG!$AUTO
010106                                  CMDFIL  LINE2.TSX
010106                                  TRMTYP  VT100
010106                                  LINEND

010126                                  LINDEF  210,173300      ;Communications port
010126                                  NAME    <Com. port>
010126                                  FLAGS   NRMFLG!$AUTO!$PHONE
010126                                  CMDFIL  LINE3.TSX
010126                                  TRMTYP  VT100
010126                                  LINEND
                                ;
                                ;   Define lines on Pro quad serial line unit
                                ;
010146                                  MUXDEF  300,160000      ;Quad serial line unit
                                ;
                                ;   Line 0 on quad serial line unit
                                ;
010146                                  LINDEF  0
010146                                  NAME    <QSL 0>
010146                                  TRMTYP  VT100
010146                                  CMDFIL  LINE3.TSX
010146                                  FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010146                                  LINEND
                                ;
                                ;   Line 1 on quad serial line unit
                                ;
010166                                  LINDEF  1
010166                                  NAME    <QSL 1>
010166                                  TRMTYP  VT100
010166                                  CMDFIL  LINE3.TSX
010166                                  FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010166                                  LINEND
                                ;
```

```
                              ;  Line 2 on quad serial line unit
                              ;
010206                                LINDEF  2
010206                                NAME    <QSL 2>
010206                                TRMTYP  VT100
010206                                CMDFIL  LINE3.TSX
010206                                FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010206                                LINEND
                              ;
                              ;  Line 3 on quad serial line unit
                              ;
010226                                LINDEF  3
010226                                NAME    <QSL 3>
010226                                TRMTYP  VT100
010226                                CMDFIL  LINE3.TSX
010226                                FLAGS   NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
010226                                LINEND
                              ;
010246                                MUXEND
                              ;
                              ;;
                              ;  Use the "DETACH" macro here to declare any start-up command
                              ;  files to be run as detached jobs.
                              ;
010246                                DETACH  SY:DET1.TSX     ;Start-up detach job command file
010370                                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
010512                                    .CSECT  TSGEN
                                  ;
                                  ;  Define mux interrupt entry vectors
                                  ;
                                  ;  Input interrupt entry points
        000001                            .REPT   LSTMX/2
                                          INCB    MUXNUM
                                          .ENDR
010516  000167  000000G           INMXV:  JMP     ININT
                                  ;  Output interrupt entry points (set up by TSINIT)
010522                            OTMXV:  .BLKW   3*<LSTMX/2>
                                  ;
                                  ;  Generate tables for Unibus map registers
                                  ;
                                          .GLOBL  UMRBAS,UMREND,UMRWHD
010530  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.
010532                            UMRBAS:
                                          .IF     EQ,<BUSTYP-UNIBUS>      ;Generate only for UNIBUS machines
                                          UMRDEF  1.
                                          UMRDEF  1.
                                          UMRDEF  4.
                                          UMRDEF  4.
                                          UMRDEF  8.
                                          UMRDEF  8.
                                          .ENDC
010532                            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
```

```
                                ;
                                ;       Generate tables to keep track of allocated devices
                                ;
                                        .IF     LT <MAXALC-1>           ;Make sure we have at least 1 entry
                                MAXALC  =       1
                                        .ENDC
 010532                         ALCTBL:                                 ;Base of device allocation table
           000005                       .REPT   MAXALC
                                        .WORD   0                       ;AD$DVU
                                        .BYTE   0                       ;AD$JOB
                                        .BYTE   0                       ;AD$FLG
                                        .ENDR
 010556                         ALCEND:                                 ;End of device allocaton table
                                ;
                                ;       Check validity of PMSIZE
                                ;
                                        .IF     GT <PMSIZE-8192.> ;PMSIZE MAY NOT EXCEED 8192.
                                .ERROR 0;PMSIZE may not exceed 8192.
                                PMSIZE  =       8192.
                                        .ENDC
                                ;
                                ;       Check validity of MIOBSZ
                                ;
                                        .IF     GT <MIOBSZ-15.>
                                .ERROR 0;MIOBSZ may not exceed 15.
                                MIOBSZ  =       15.
                                        .ENDC
                                ;
                                ;       Check validity of CACHE parameter
                                ;
                                        .IF     GT <CACHE-4095.>
                                CACHE   =       4095.
                                        .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
010556                  VCBBAS:
        000000                  .REPT   RTVECT
                                JSR     R2,@#RTINT
                                .WORD   0,0,0           ;Must match size defined in TSDEFS
                                .ENDR
010556                  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
010556                  DHTIMR:
010556                  DHSTRT:
010556                  DHSTOP:
010556                  DHXON:
010556                  DHXOFF:
010556                  DHOINT:
010556                  VHSTRT:
010556                  VHSTOP:
010556                  VHXON:
010556                  VHXOFF:
010556                  VHOINT:
010556  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$COD
                                  ;
                                          .IF     NE,CLVRSN       ; Test to see if CLVRSN is defined as 0
                                          .IF     LE,<CLVRSN-14.> ; or greater than 14.
                                          .ERROR 0;Minimum CL version number is 15.  ;If not report an error
                                          CLVRSN  = 15.           ; and set to a reasonable number
                                          .ENDC                   ; End conditional LE,<CLVRSN-14.>
                                          .ENDC                   ; End conditional NE,CLVRSN
                                  ;
                                  ;  Define table that tells which line is associated with each CL unit.
                                  ;  Note, this table is always generated.  Even if there are no CL lines
                                  ;  genned in.
                                  ;
010560  000000   000000   000000  CL$LIX: .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 ;Line index for each CL unit
010566  000000   000000   000000
010574  000000   000000   000000
010602  000000   000000   000000
010610  000000   000000   000000
010616  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
                                  ;**
010620                                    CLTABL  CL$OPT          ;Option flags (CO$xxx)
010634                                    CLTABL  CL$STA          ;Status flags (CM$xxx)
010650                                    CLTABL  CL$COL          ;Current column position
010664                                    CLTABL  CL$LEN          ;Number of lines per page
010700                                    CLTABL  CL$LIN          ;Current line number
010714                                    CLTABL  CL$XLN          ;Number of line CL unit is cross connected to
010730                                    CLTABL  CL$SKP          ;Number of lines to skip at bottom of page
010744                                    CLTABL  CL$WID          ;Maximum allowed line width
010760                                    CLTABL  CL$RQH          ;Internal queue head for read requests
010774                                    CLTABL  CL$WQH          ;Internal queue head for write requests
011010                                    CLTABL  CL$ORB          ;Start of output ring buffer
011024                                    CLTABL  CL$ORE          ;End of output ring buffer
011040                                    CLTABL  CL$ORP          ;Pointer where next char goes in output ring
011054                                    CLTABL  CL$ORG          ;Pointer to next char to get from output ring
011070                                    CLTABL  CL$ORA          ;Allocated size of output ring buffer
011104                                    CLTABL  CL$ORS          ;Free space in output ring buffer
011120                                    CLTABL  CL$EPN          ;Number of Form-feeds for end page
```

```
011134                          CLTABL  CL$EPS          ;Pointer to end-of-file string buffer
011150                          CLTABL  CL$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$ORP:
                        CL$ORG:
                        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
                        ;
011164  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: 173
Work  file writes: 159
Size of work file: 23718 Words  ( 93 Pages)
Size of core pool: 18176 Words  ( 71 Pages)
Operating  system: RT-11

Elapsed time: 00:01:44.23
,LP:PROGEN=DK:PROGEN/C/N:SYM
```

```
$8BIT   16-68#
$ALTER  16-70#
$AUTO   16-73#    17-24     17-31     17-46     17-55     17-64     17-73
$DEFER  16-77#    16-85
$ECHO   16-66#    16-85
$FORM   16-72#
$INDDV   2-111#
$LC     16-75#    16-85
$MEMSZ   1-50      2-108#
$NOSUB  16-76#
$NOVLN   1-174#
$PAGE   16-74#    16-85
$PHONE  16-80#    17-31     17-46     17-55     17-64     17-73
$PRIV    1-173#
$QTSET  16-78#
$SCOPE  16-65#    17-19     17-46     17-55     17-64     17-73
$START  16-69#    17-19
$SYSPS  16-79#
$TAB    16-71#    17-19     17-46     17-55     17-64     17-73
$TAPE   16-67#
$TCFIG   2-110#
ABRTOV   1-126     3-97#
ADM3A    1-136
AHEND    1-89     15-578#
ALCEND   1-86     19-127#
ALCTBL   1-86     19-121#
AUTHAN   1-89     15-572#
BASMAP   1-110     3-337#
BLKEY    1-98      2-61#
BLKMV    1-137     2-231
BMJMP    2-229     2-231#
BO       7-50#    17-15     17-15#    17-20     17-20#    17-22     17-22#    17-27     17-27#    17-29     17-29#    17-34
        17-34#    17-42     17-42#    17-47     17-47#    17-51     17-51#    17-56     17-56#    17-60     17-60#    17-65
        17-65#    17-69     17-69#    17-74     17-74#    17-82     17-83     19-26     19-69     19-69     19-69     19-69#
        19-69#    19-69#    19-69#    19-69#    19-69#
BOTCSR   1-88      3-107#
BOTDEV   1-88      3-105#
BOTUNI   1-88      3-106#
BUSTYP   3-178    15-90#    19-97
C       15-691    15-691    15-691    15-691    15-691#   15-691#   15-691#
C1DEVX   1-105     3-104#
CA$BLK   1-120     3-126#
CA$DVU   1-120     3-127#
CA$HBL   1-120     3-132#
CA$HFL   1-120     3-131#
CA$HSH   1-120     3-133#
CA$UBL   1-120     3-130#
CA$UFL   1-120     3-129#
CA$WCT   1-120     3-128#
CACHE    3-40      3-41     15-365#   19-145
CASCBR   1-122     3-141#
CASCUP   1-122     3-144#
CASTBR   1-122     3-140#
CASTBW   1-122     3-143#
CASTRO   1-122     3-139#
CASTWO   1-122     3-142#
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CCBHD    1-121     3-138#
CCLSAV   1-103     3-65#
CCXCTL   3-194    15-491#
CCXTRM   3-193    15-484#
CDX$DH   1-78      1-216#
CDX$DL   1-78      1-214#    1-232    17-76
CDX$DZ   1-78      1-215#   17-38     17-38
CDX$PC   1-78      1-219#
CDX$PI   1-77      1-218#
CDX$PP   1-78      1-220#
CDX$QP   1-79      1-221#
CDX$VH   1-78      1-217#
CFABLV   1-50      2-98#
CFCHAN   1-69      1-223#
CFSTS    1-50      2-94#     2-217
CHKEY    1-98      2-62#
CL$COL  21-55     21-95#
CL$EPN  21-58     21-109#
CL$EPP  21-58     21-111#
CL$EPS  21-58     21-110#
CL$LEN  21-57     21-96#
CL$LIN  21-57     21-97#
CL$LIX  21-57     21-78#
CL$OPT  21-55     21-93#
CL$ORA  21-56     21-107#
CL$ORB  21-56     21-103#
CL$ORE  21-56     21-104#
CL$ORG  21-56     21-106#
CL$ORP  21-56     21-105#
CL$ORS  21-56     21-108#
CL$RQH  21-55     21-101#
CL$SKP  21-57     21-99#
CL$STA  21-55     21-94#
CL$WID  21-57     21-100#
CL$WQH  21-55     21-102#
CL$XLN  21-58     21-98#
CLDEVX   1-105     3-103#
CLEOFS   1-55      1-171#
CLKVEC   1-126     1-167#
CLORSZ   1-61     16-59#
CLSCDB   1-125     3-168#
CLSTS   21-58     21-65#
CLTOTL   1-64     17-10#    21-89     21-93     21-94     21-95     21-96     21-97     21-98     21-99     21-100    21-101
        21-102    21-103    21-104    21-105    21-106    21-107    21-108    21-109    21-110    21-111
CLVERS   1-61      3-218#
CLVRSN   3-218    15-498#   21-67
CLX     17-15     17-15     17-15     17-15     17-15     17-15     17-15     17-15#    17-16     17-17     17-18     17-20
        17-20     17-20     17-20     17-20     17-20     17-20     17-20     17-20     17-22     17-22     17-22     17-22
        17-22     17-22     17-22#    17-23     17-25     17-26     17-27     17-27     17-27     17-27     17-27     17-27
        17-27     17-27     17-27     17-29     17-29     17-29     17-29     17-29     17-29     17-29#    17-30     17-32
        17-33     17-34     17-34     17-34     17-34     17-34     17-34     17-34     17-34     17-34     17-42     17-42
        17-42     17-42#    17-43     17-44     17-45     17-47     17-47     17-47     17-47     17-47     17-47     17-47
        17-47     17-47     17-51     17-51     17-51     17-51#    17-52     17-53     17-54     17-56     17-56     17-56
        17-56     17-56     17-56     17-56     17-56     17-56     17-60     17-60     17-60     17-60#    17-61     17-62
        17-63     17-65     17-65     17-65     17-65     17-65     17-65     17-65     17-65     17-65     17-69     17-69
        17-69     17-69#    17-70     17-71     17-72     17-74     17-74     17-74     17-74     17-74     17-74     17-74
        17-74    17-74    17-82    17-82#   17-83    17-83#   19-69    19-69    19-69    19-69    19-69    19-69
        19-69    19-69    19-69    19-69#   19-69#   19-69#
CLXTRA   1-64    16-53#   17-10    17-10
CMFDON  17-15#   17-17#   17-20    17-22#   17-25#   17-27    17-29#   17-32#   17-34    17-42#   17-45#   17-47
        17-51#   17-54#   17-56    17-60#   17-63#   17-65    17-69#   17-72#   17-74    19-69    19-69    19-69
CMFSEC   1-72     8-81#
CMFTOP   1-72    17-17#   17-25#   17-32#   17-45#   17-54#   17-63#   17-72#
CONFG2   1-105    2-95#
CONFIG   1-99     2-81#
CORTIM   1-109    3-11    15-321#
CORUSR   1-93     2-88#    2-213
CP$RT    1-206    1-209#
CP$STD   1-206    1-208#
CP$SYN   1-206    1-210#
CSHALC   1-62     3-41#
CSHBAS   1-123    3-73#
CSHBFP   1-121    3-134#
CSHCLN   1-123    3-149#
CSHDEV   1-85     3-99#
CSHDVN   1-85     3-100#
CSHFHD   1-121    3-137#
CSHFIN   1-123    3-150#
CSHHD    1-85     3-81#
CSHINI   1-123    3-147#
CSHIO    1-123    3-148#
CSHLRU   1-121    3-135#
CSHMRU   1-121    3-136#
CSHSIZ   1-116    3-349#
CSHVEC   1-123    3-146#
CTRLTT   1-63     3-60#   17-15
CURCDX   1-232#  17-15    17-22    17-29    17-38#   17-42    17-51    17-60    17-69    17-76#
CURMX    1-230#  17-15    17-22    17-29    17-38    17-38    17-38    17-38    17-38    17-38    17-38    17-38
        17-38    17-38#   17-42    17-42    17-51    17-51    17-60    17-60    17-69    17-69    17-76    17-76#
        19-30
CURMXL  17-15#   17-20    17-22#   17-27    17-29#   17-34    17-42    17-42#   17-47    17-51    17-51#   17-56
        17-60    17-60#   17-65    17-69    17-69#   17-74
CURUMR  19-95#
CVTPHY   1-137    2-226
CXBBAS   1-129    3-365#
CXBSIZ   1-129    3-366#
CXTBUF   1-129    3-364#
CXTPAG   1-129    3-361#
CXTPDR   1-129    3-362#
CXTRMN   1-129    3-363#
CXTWDS   1-129    3-360#
DATIMH   1-128    3-238#
DATIML   1-128    3-237#
DBGFLG   3-185   15-247#
DCAGE    1-81     1-168#
DCCRD    1-67     3-244#
DCCWR    1-67     3-246#
DCRD1    1-126    3-169#
DCRD2    1-126    3-170#
DCTOTU   1-67     3-242#
DCTRD    1-67     3-243#
DCTWR    1-67     3-245#
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DEFBAS    3-111#
DETCBS    1-52      1-147#   17-82     17-83
DEVSIZ    1-101     2-172#
DEVXMR    3-36     15-601#
DFJMEM    1-111     3-344#
DFLAGS   17-15#    17-19#    17-20     17-22#    17-24#    17-27     17-29#    17-31#    17-34     17-42#    17-46#    17-47
         17-51#    17-55#    17-56     17-60#    17-64#    17-65     17-69#    17-73#    17-74
DFLG      1-98      2-64#
DFLMEM    3-32     15-35#    19-10
DHBFSZ    1-75      1-153#
DHOINT   21-34     21-43#
DHSTOP   21-34     21-40#
DHSTRT   21-34     21-39#
DHTIMR   21-35     21-38#
DHUSE     1-233#   21-26
DHXOFF   21-36     21-42#
DHXON    21-36     21-41#
DIABLO    1-137
DINSPC    3-49     16-10#    17-15     17-22     17-29     17-42     17-51     17-60     17-69     19-69     19-69     19-69
DIS      17-15#    17-20     17-22#    17-27     17-29#    17-34     17-42#    17-47     17-51#    17-56     17-60#    17-65
         17-69#    17-74     19-69     19-69     19-69     19-69#    19-69#    19-69#
DLINT     1-133    17-10     17-10     17-10     17-10     17-10     17-10     17-10
DM$CSR    3-276     3-276#    3-294
DM$LSR    3-277     3-277#    3-293
DM$VEC    3-278     3-278#
DMA       4-19#
DMPKTP    3-176    15-170#
DMPTCR    3-119    15-163#
DOCOPN    1-124     3-158#
DOCULK    1-125     3-163#
DOOPAP    1-124     3-157#
DORLK     1-124     3-161#
DOS      17-15#    17-20     17-22#    17-27     17-29#    17-34     17-42#    17-47     17-51#    17-56     17-60#    17-65
         17-69#    17-74     19-69     19-69     19-69     19-69#    19-69#    19-69#
DOSCHD    1-46      3-217#
DOSFCK    1-125     3-165#
DOTLK     1-125     3-162#
DOTSPC    3-50     16-11#    17-15     17-22     17-29     17-42     17-51     17-60     17-69     19-69     19-69     19-69
DOULK1    1-125     3-164#
DSKBUF    1-139     3-45     21-186
DTYPE     1-48     15-572#
DVFLAG    1-114     2-181#
DVFLG    15-574    15-574#   15-575    15-575#   15-576    15-576#   15-577    15-577    15-577#   15-577#   15-578    15-578#
DVNUM     4-38#    15-574    15-574    15-574#   15-575    15-575    15-575#   15-576    15-576    15-576#   15-577    15-577
         15-577#   15-578    15-578    15-578    15-578#
DVSTAT    1-100     2-163#
DWTYPE    1-79      2-116#
EDIT      3-378#
EDITOR    3-196    15-520#
EMTRTN    2-100#
EVEN      3-410#
EVNBUF    4-21#
EXCJOB    1-46      3-216#
EXTCHN    1-113     2-189#    2-200     2-211
EXTP1     1-137     2-230
F        13-5#     15-622
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F1       13-12#    15-622#   15-643    15-643#   15-665    15-665#   15-691
F10      13-21#
F11      13-22#
F12      13-23#
F13      13-24#
F14      13-25#
F15      13-26#
F16      13-27#
F17      13-28#
F18      13-29#
F19      13-30#
F2       13-13#    15-622#   15-643    15-643#   15-665    15-665#   15-691
F20      13-31#
F21      13-32#
F22      13-33#
F23      13-34#
F24      13-35#
F25      13-36#
F26      13-37#
F27      13-38#
F28      13-39#
F29      13-40#
F3       13-14#
F30      13-41#
F4       13-15#
F5       13-16#
F6       13-17#
F7       13-18#
F8       13-19#
F9       13-20#
FASTIN    1-53      1-166#
FIRST     3-385#
FNDHRB    1-133     2-227
FORKQ     1-138     2-17
FP$CDI    1-184     1-190#
FP$CDO    1-184     1-191#
FP$CK1    1-184     1-196#
FP$CKT    1-183     1-189#
FP$DEF    1-183     1-192#
FP$FLG    1-184     1-186#    1-187     1-188     1-189     1-190     1-191     1-192     1-193     1-194     1-195     1-196
          1-198     1-199
FP$IOA    1-183     1-194#
FP$IOF    1-183     1-193#
FP$IOS    1-183     1-198#
FP$MAX    1-184     1-187#
FP$MOV    1-183     1-199#
FP$PIO    1-184     1-195#
FP$RT     1-183     1-188#
FREFRK    1-88      3-301#
FREIOQ    1-102     3-249#
FREPGS    1-110     3-341#
FREUMR    1-47      2-20
FRKADR    2-101#
FRKDLY    1-94      3-59#
FRKGEN    1-56      1-148#    3-304
FRKGET    1-138     2-16
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FRKINI   1-56      3-302#
FRKLST   3-301     3-303#
FSTDL    1-92     17-10#
FSTIOL   1-49     17-10     17-10#
FSTSL    1-63     17-10#
FULLST   1-39#     1-41     14-1      18-1      18-2      21-174
GENTOP   1-109    21-173#
GETRTQ   1-138     2-11
GETUMR   1-47      2-19
H       13-8#     15-665    15-691    15-691
HANBUF   4-27#
HANDSK   1-46      2-166#
HANENT   1-100     2-9       2-159#
HANIOC   1-101     2-178#
HANPAR   1-119     2-10      2-175#
HANRCB   1-46      3-122#
HANRCO   1-46      2-238#
HANSIZ   1-100     2-169#
HANXMR   1-137     2-228
HAZEL    1-137
HIMAP    1-110     3-339#
HIMEM    2-68      3-31     15-30#    19-6      19-10
HIPRCT   3-12     15-312#
HNMEPT   2-112     2-236#
HNSPDO   4-28#
HSUFFX   2-104#
I       17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10
        17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10
        17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10#
        17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#
        17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#
IDSFLG   1-115     3-211#
ILSW2   17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74
INDDBL   1-104     3-67#
INDDBS   1-104     3-68#
INDDEV   2-122#
INDFIL   1-91     15-25#
INDOFF   2-111     2-121#
INDSAV   1-103     3-66#
INDTSV   1-104     2-196#    2-218
INIABT   3-179    15-120#
ININT    1-133    17-10     19-79
INMXV    1-59     19-79#
INRECV   1-57     17-10#
INSTA    2-107#    2-216
INSTBL   1-51      3-95#
INSTBN   1-51      3-96#
INTEN    1-135     2-38
INTIOC   3-13     15-305#
INTSSZ   1-102     1-159#
INVEC    1-56     17-10     17-10#    17-15     17-22     17-29
IOABFL   1-63      3-110#
IOABT    3-110    15-180#
IOFIN    1-135     2-69
IOHANQ   1-47      2-18
IOHLTM   1-54      1-170#
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IOLFLG   7-52#    17-15    17-15    17-17    17-18    17-20    17-20    17-20    17-20#   17-22    17-22    17-25
        17-26    17-27    17-27    17-27    17-27#   17-29    17-29    17-32    17-33    17-34    17-34    17-34
        17-34#   17-42    17-42    17-44    17-45    17-47    17-47    17-47    17-47#   17-51    17-51    17-53
        17-54    17-56    17-56    17-56    17-56#   17-60    17-60    17-62    17-63    17-65    17-65    17-65
        17-65#   17-69    17-69    17-71    17-72    17-74    17-74    17-74    17-74#   19-69    19-69    19-69
        19-69    19-69    19-69    19-69#   19-69#   19-69#
IOLN     7-53#
IOQSIZ   1-139     2-22
IOSTRT   1-138     2-14
ITRMTP  17-10    17-10#   17-18    17-26    17-33    17-44    17-53    17-62    17-71
JCXPGS   1-111     3-342#
K52      3-381#
KED      3-380#   15-520
KEYMAX   3-38     15-232#
KMNCHN   1-127     3-356#
KMNHI    1-53      3-64#
KMNPGS   1-127     3-355#
KMNSTK   1-127     3-353#
KMNSTR   1-127     3-354#
KMNTOP   1-53      3-63#
KMONCE   1-46      3-215#
KUSECK   1-119     1-169#
L       15-578    15-578    15-578#
LA120    1-136
LA36     1-136
LABTIM  17-10    17-10#
LACTIV  17-10    17-10#
LAFSIZ  17-10    17-10#
LAST     3-387#
LBASE   17-10    17-10#
LBRKCH  17-10    17-10#
LBRKCQ  17-10    17-10#
LBSPRI  17-10    17-10    17-10#
LCDTIM  17-10    17-10#
LCDTYP  17-10    17-10#   17-15    17-22    17-29    17-42    17-51    17-60    17-69
LCLUNT  17-10    17-10#
LCMPL   17-10    17-10#
LCMQHD  17-10    17-10#
LCOL    17-10    17-10#
LCONTM  17-10    17-10#
LCPUHI  17-10    17-10#
LCPULO  17-10    17-10#
LCXPAR  17-10    17-10#
LCXTBL  17-10    17-10#   17-20    17-27    17-34    17-47    17-56    17-65    17-74
LDDEVX   1-105     3-102#
LDHB1B  17-10    17-10#
LDHB1P  17-10    17-10#
LDHB2B  17-10    17-10#
LDHB2R  17-10    17-10#
LDHB2S  17-10    17-10#
LDSYS    3-183    15-214#
LDVERS   1-61      3-219#
LEMTPC  17-10    17-10#
LESCHR  17-10    17-10#
LESRTN  17-10    17-10#
LF      17-20    17-20#   17-20#   17-27    17-27#   17-27#   17-34    17-34#   17-34#   17-47    17-47#   17-47#
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        17-56     17-56#    17-56#    17-65     17-65#    17-65#    17-74     17-74#    17-74#    19-69     19-69     19-69
        19-69#    19-69#    19-69#
LFWLIM  17-10     17-10#
LHIPCT  17-10     17-10#
LHIRBA  17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74
LHIRBB  17-10     17-10#
LHIRBC  17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74
LHIRBE  17-10     17-10#
LHIRBG  17-10     17-10#
LHIRBP  17-10     17-10#
LHIRBS  17-10     17-10#
LINBUF  17-10     17-10#
LINCNT  17-10     17-10#
LINCUR  17-10     17-10#
LINEND  17-10     17-10#
LINIR   17-10     17-10#
LINNUM   1-93      1-133     3-202#   17-10*    17-10*    17-10*    17-10*    17-10*    17-10*    17-10*
LINNXT  17-10     17-10#
LINPNT  17-10     17-10#
LINSIZ  17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74     19-69     19-69     19-69
LINSPC  17-10     17-10#
LIOCNT  17-10     17-10#
LIOHLD  17-10     17-10#
LITIME  17-10     17-10#
LJSW    17-10     17-10#
LMEMIN  17-10     17-10#
LMINQ   17-10     17-10#
LMONHD  17-10     17-10#
LMSGBF  17-10     17-10#
LMXLN    1-59     17-10#    17-42     17-51     17-60     17-69
LMXNUM  17-10     17-10#    17-42     17-51     17-60     17-69
LMXPRM   1-59     17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74
LN       7-49#    17-15     17-15     17-15#    17-20     17-22     17-22     17-22#    17-27     17-29     17-29     17-29#
        17-34     17-42     17-42     17-42#    17-47     17-51     17-51     17-51#    17-56     17-60     17-60     17-60#
        17-65     17-69     17-69     17-69#    17-74     17-82     17-82     17-82#    17-83     17-83     17-83#    19-49
        19-52     19-69     19-69     19-69     19-69     19-69     19-69     19-69#    19-69#    19-69#
LNAME   17-10     17-10#    17-16     17-23     17-30     17-43     17-52     17-61     17-70
LNBLKS  17-10     17-10#
LNMAP    1-60     17-10#
LNMTOP   1-48     17-16#    17-23#    17-30#    17-43#    17-52#    17-61#    17-70#
LNPRIM   1-60     17-10#
LNSBLK  17-10     17-10#
LNSPAC  17-10     17-10#
LOFFTM  17-10     17-10#
LOGCHN   1-68      1-224#
LOKBAS   1-82      3-72#
LOKCSH   1-82      3-76#
LOKINI   1-124     3-156#
LOKMEM   1-82      3-75#
LOKVEC   1-124     1-126     3-155#
LOMAP    1-110     3-338#
LOTBUF  17-10     17-10#
LOTEND  17-10     17-10#
LOTNXT  17-10     17-10#
LOTPNT  17-10     17-10#
LOTSIZ  17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74     19-69     19-69     19-69
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LOTSPC  17-10     17-10#
LOUTIR  17-10     17-10#
LPARBS  17-10     17-10#
LPARNT  17-10     17-10#
LPRG1   17-10     17-10#
LPRG2   17-10     17-10#
LPRI     1-60     17-10#
LPROG   17-10     17-10#
LPROJ   17-10     17-10#
LQLINK  17-10     17-10#
LQUAN   17-10     17-10#
LRBFIL  17-10     17-10#
LRDTIM  17-10     17-10#
LRTCHR  17-10     17-10#
LSCCA   17-10     17-10#
LSECPT  17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74
LSLEPH  17-10     17-10#
LSLEPL  17-10     17-10#
LSNDCH  17-10     17-10#
LSPACT  17-10     17-10#    17-20     17-27     17-34     17-47     17-56     17-65     17-74     19-69     19-69     19-69
LSPND   17-10     17-10#
LSTACT  17-10     17-10#
LSTATE  17-10     17-10#
LSTDL    1-92     17-10     17-10#
LSTHL    1-49     17-10#
LSTIOL   1-57     17-10#
LSTLIN   1-58     17-10#
LSTMX    1-58      1-229#   17-38     17-38     17-38#    19-76     19-81
LSTPL    1-57     17-10     17-10     17-10#
LSTPRM   8-137#   17-20     17-20     17-27     17-27     17-34     17-34     17-47     17-47     17-56     17-56     17-65
        17-65     17-74     17-74
LSTSL    1-63     17-10     17-10#
LSUCF   17-10     17-10#    17-17     17-25     17-32     17-45     17-54     17-63     17-72     17-82     17-83
LSW     17-10     17-10#
LSW10   17-10     17-10#
LSW11   17-10     17-10#
LSW2    17-10     17-10#
LSW2S   17-10     17-10#
LSW3    17-10     17-10#
LSW4    17-10     17-10#
LSW5    17-10     17-10#
LSW6    17-10     17-10#
LSW7    17-10     17-10#
LSW8    17-10     17-10#
LSW9    17-10     17-10#
LSWPBK  17-10     17-10#
LTRMTP  17-10     17-10#
LTSCMD  17-10     17-10#
LTTCR   17-10     17-10#
LTTPAR  17-10     17-10#
LUNAME   1-57     17-10#
LWINDO  17-10     17-10#
LX       7-51#    17-15     17-15     17-15#    17-22     17-22     17-22#    17-29     17-29     17-29#    17-42     17-42
        17-42#    17-51     17-51     17-51#    17-60     17-60     17-60#    17-69     17-69     17-69#    17-82     17-82
        17-82#    17-83     17-83     17-83#    19-69     19-69     19-69     19-69     19-69     19-69     19-69#    19-69#
        19-69#
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LXCL     17-10     17-10#
LXX      17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10
         17-10     17-10     17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#    17-10#
MAPH      4-25#    15-577
MAPIO     4-20#
MAPPAR    1-84      3-340#
MAPSIZ    1-113     3-336#
MAPUSR    1-92      3-201#
MAXALC    1-86     15-389#   19-118    19-122
MAXBLK    1-99      2-83#
MAXCSH    3-98     15-379#   19-109
MAXDEV    1-101     1-144#    2-156     2-159     2-163     2-166     2-169     2-172     2-175     2-178     2-181    15-574
         15-575    15-576    15-577    15-578    15-578
MAXFIL    2-83      3-19     15-356#
MAXGVL    1-105     2-184#
MAXMC     3-27     15-733#
MAXMON    3-21     15-393#
MAXMRB    3-30     15-745#
MAXMSG    3-29     15-741#
MAXMUX    1-152#    3-263     3-264     3-265     3-266     3-267     3-268     3-269     3-270     3-271     3-272     3-273
          3-274     3-275     3-276     3-277     3-278
MAXSEC    1-64     15-351#   17-20     17-20     17-27     17-27     17-34     17-34     17-47     17-47     17-56     17-56
         17-65     17-65     17-74     17-74
MAXSF     3-14     15-703#   20-4
MAXSFC    3-15      3-78     15-710#
MAXWIN    3-37     15-241#
MEM256    1-86      3-212#
MEMPTR    1-50      2-112#
MEMSIZ    3-336    15-100#
MFPMOV    2-133#    2-220
MFPS      2-92      2-132#
MH$BAR    1-75      3-287#
MH$BCR    1-75      3-286#    3-297
MH$BRK    3-273     3-273#
MH$CAR    1-74      3-285#    3-295
MH$LPR    3-274     3-274#    3-292
MH$PBR    3-275     3-275#
MH$RCR    1-74      3-284#    3-291
MH$SCR    1-74      3-283#    3-290
MH$SSR    1-75      3-288#    3-296
MHNSIZ    1-119     3-347#
MIDDLE    3-386#   15-207
MINTIM    1-94      3-61#
MIOBHD    1-52      3-83#
MIOBSZ    3-198    15-593#   19-138
MIODBG    1-84      1-162#
MIOFLG    1-88      3-213#
MIONBF    3-197    15-588#
MIONWB    1-91      1-161#
MIOSYQ    1-116     3-85#
MIOWHD    1-116     3-84#
MNUAOT    1-160#    3-200
MODDAT    1-70      3-120#
MODTIM    1-72      3-121#
MONAME    2-103#
MONFQH    1-61      3-82#
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MPARFL   1-117    1-163#
MSCHRS   3-28     15-737#
MSGBAS   1-80     3-70#
MTPS     2-91     2-148#
MUXNUM   1-93     1-134    3-203#   19-78*
MVSIZ    1-69     2-204#   2-205
MVWDS    1-113    2-205#
MXBRK    1-74     3-281#
MXCAR    3-270    3-270#   3-281    3-288    17-38
MXCSR    3-264    3-264#   3-283    17-38
MXDTR    3-267    3-267#   3-286    17-38
MXJADR   1-108    3-345#
MXJMEM   1-111    3-343#
MXLBLK   3-17     15-716#
MXLNT    3-272    3-272#
MXLPR    3-265    3-265#   3-279    17-38
MXRBUF   1-74     3-279#   3-284
MXRING   1-74     3-280#
MXSBRK   3-269    3-269#
MXSPAC   1-73     15-503#  17-20    17-27    17-34    17-47    17-56    17-65    17-74    19-69    19-69    19-69
MXTBUF   3-268    3-268#   3-280    3-287    17-38
MXTCR    3-266    3-266#   3-285    17-38
MXTTCT   1-46     15-511#  17-20    17-20    17-27    17-27    17-34    17-34    17-47    17-47    17-56    17-56
        17-65    17-65    17-74    17-74
MXTYPE   3-263    3-263#   17-38
MXVEC    3-271    3-271#   17-38
N        13-6#    15-622   15-643   15-665
NAMDON   17-15#   17-16#   17-20    17-22#   17-23#   17-27    17-29#   17-30#   17-34    17-42#   17-43#   17-47
         17-51#   17-52#   17-56    17-60#   17-61#   17-65    17-69#   17-70#   17-74    19-69    19-69    19-69
NAMPTR   17-16    17-16#   17-17    17-17#   17-23    17-23#   17-25    17-25#   17-30    17-30#   17-32    17-32#
        17-43    17-43#   17-45    17-45#   17-52    17-52#   17-54    17-54#   17-61    17-61#   17-63    17-63#
        17-70    17-70#   17-72    17-72#
NAMSEC   1-48     8-27#
NCLDF    7-55#    19-40    19-55
NCSILO   1-62     3-46     16-32#   19-17    19-18
NCXOFF   1-62     3-47     16-38#   19-19    19-20    19-20#
NCXON    1-62     3-48     16-44#   19-21    19-22    19-22#
NDL      1-92     17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10
        17-10    17-10    17-10#   17-82    17-82    17-83    17-83    19-43    19-49    19-52
NDLDF    7-56#    17-82    17-82#   17-83    17-83#   19-43
NDRTDF   1-172#   20-23
NDVRCB   1-59     3-36#
NESB     1-53     15-691#
NFRESB   1-55     3-92#
NGR      3-35     15-79#
NIOL     1-49     17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10
        17-10    17-10    17-10    17-10    17-10    17-10#   19-40    19-55
NLCHN    1-50     1-228#   2-190
NLIN2    1-49     17-10    17-10#
NLINES   1-50     17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10
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        17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10
        17-10     17-10     17-10     17-10     17-10#
NMFCSH   3-20     15-384#   19-112
NMFREQ   1-102    21-156#
NMSNMB   1-109     1-149#    3-80
NMSYMB   1-150#    3-80
NMUMB    1-109     3-80#
NOCACH   4-22#
NODMA    4-31#     4-32
NOMAPH   4-26#
NOMOUN   4-23#
NONDMA   4-32#
NONE     3-412#    8-137
NOSET    4-29#
NPL      1-49     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10
        17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10#
        17-15     17-20     17-22     17-27     17-29     17-34     17-42     17-47     17-51     17-56     17-60     17-65
        17-69     17-74     17-82     17-83     19-37     19-49     19-52     19-69     19-69     19-69
NPLDF    7-54#    17-15     17-15#    17-22     17-22#    17-29     17-29#    17-42     17-42#    17-51     17-51#    17-60
        17-60#    17-69     17-69#    19-37
NRMFLG   3-42     16-85#    17-15     17-19     17-22     17-24     17-29     17-31     17-42     17-46     17-51     17-55
        17-60     17-64     17-69     17-73
NSCP     1-65      1-158#
NSL      1-49     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10
        17-10     17-10     17-10#    19-61     19-62
NSPLBL   1-60      3-91#
NSPLDV   1-55      3-214#
NSPLFL   1-60      3-90#
NUCHN    1-69      1-151#    1-223     1-224     1-225     1-226     1-227     1-228
NUIP     3-39     15-251#
NUMCCB   1-107     1-157#
NUMCDB   1-81      3-78#
NUMDC    3-16      3-77     15-723#
NUMDCD   1-81      3-77#
NUMDEV   1-101     2-8       3-248#
NUMFRK   1-57      1-145#
NUMIOQ   1-102     1-155#   21-13     21-13#    21-156
NUMON    1-93      3-204#
NUMRDB   1-84      1-231#   20-25     20-25     20-25#    20-25#
NUMSYQ   1-102     1-156#   21-14     21-14#    21-156
NXIVMH   1-57      1-146#
ODD      3-411#
OFFTIM   3-26     15-435#
ONTIM    3-25     15-442#
OTMXV    1-59     19-81#
OTRASZ   1-60     16-17#
OTRECV   1-57     17-10#
P1EXT    2-113#
P1XPTR   2-113     2-230#
PHONE    3-199    15-454#   21-164
PHYMEM   1-50      2-155#
PIDPTR   1-117     3-116#
PMSIZE   3-43     15-768#   19-131
PNAME    1-100     2-102     2-156#
PNPTR    2-102#
PRIDEF   3-188    15-340#
PRIHI    3-187    15-336#
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PRILOW   3-186    15-335#
PRIVIR   3-189    15-347#
PROBRK   1-118     1-164#
PROFLG   1-117     3-207#
PROITP   1-133    21-183
PROODC   1-118     1-165#
PROSLT   1-100     3-117#
PSW      1-135     2-133
PVON     1-93      3-205#
PVSPBL   1-59     15-691    15-691    15-691    15-691#
PWCH     3-192    15-471#
QBUS     1-114     3-312#   15-90
QCOMP    1-98      2-69#
QCOMPL   1-138     2-15
QFREE    1-138     2-12
QIO      1-138     2-13
QUAN0    3-4      15-260#
QUAN1    1-58      3-5      15-269#
QUAN1A   1-68      3-6      15-275#
QUAN1B   1-68      3-7      15-279#
QUAN1C   3-8      15-284#
QUAN2    1-58      3-9      15-292#
QUAN3    3-10     15-298#
QUME     1-137
R$CFST   1-58      2-217#
R$CH17   1-112     2-210#
R$CHN    1-112     2-209#
R$DATE   1-112     2-212#
R$INST   1-58      2-216#
R$INTC   1-104     2-218#
R$JOB    1-112     2-213#
R$MFMV   1-92      2-220#
R$SWPC   1-119     2-219#
R$TTOP   1-58      2-215#
R$UBAS   1-112     2-214#
R$XCHN   1-113     2-211#
RBR      1-56     17-10     17-10     17-10#    17-15     17-22     17-29
RDB      1-84      3-372#
RDBEND   1-84     21-169#
RDBSEC   1-48      3-371#
REQALC   4-24#
RF$WRT   1-109
RMNBAS   1-134     2-110     2-111
RPRCSR   1-79      2-114#
RPRVEC   1-79      2-115#
RSFBLK   1-90     15-17#
RSR      1-56     17-10     17-10#    17-15     17-22     17-29
RTVECT   1-94     15-759#   21-8      21-13     21-14     21-16
RUNCHN   1-76      1-226#
S       17-15     17-15     17-15     17-15#    17-15#    17-15#    17-16     17-16#    17-17     17-17#    17-18     17-18#
        17-20     17-20     17-20     17-20     17-20     17-20     17-20     17-20     17-20     17-20     17-20#    17-20#
        17-20#    17-20#    17-20#    17-20#    17-20#    17-20#    17-22     17-22     17-22     17-22#    17-22#    17-22#
        17-23     17-23#    17-25     17-25#    17-26     17-26#    17-27     17-27     17-27     17-27     17-27     17-27
        17-27     17-27     17-27     17-27     17-27#    17-27#    17-27#    17-27#    17-27#    17-27#    17-27#    17-27#
        17-29     17-29     17-29     17-29#    17-29#    17-29#    17-30     17-30#    17-32     17-32#    17-33     17-33#
        17-34     17-34     17-34     17-34     17-34     17-34     17-34     17-34     17-34     17-34     17-34#    17-34#
        17-34#   17-34#   17-34#   17-34#   17-34#   17-34#   17-38    17-38#   17-42    17-42    17-42#   17-42#
        17-43    17-43#   17-44    17-44#   17-45    17-45#   17-47    17-47    17-47    17-47    17-47    17-47
        17-47    17-47    17-47    17-47    17-47#   17-47#   17-47#   17-47#   17-47#   17-47#   17-47#   17-47#
        17-51    17-51    17-51#   17-51#   17-52    17-52#   17-53    17-53#   17-54    17-54#   17-56    17-56
        17-56    17-56    17-56    17-56    17-56    17-56    17-56    17-56    17-56#   17-56#   17-56#   17-56#
        17-56#   17-56#   17-56#   17-56#   17-60    17-60    17-60#   17-60#   17-61    17-61#   17-62    17-62#
        17-63    17-63#   17-65    17-65    17-65    17-65    17-65    17-65    17-65    17-65    17-65    17-65
        17-65#   17-65#   17-65#   17-65#   17-65#   17-65#   17-65#   17-65#   17-69    17-69    17-69#   17-69#
        17-70    17-70#   17-71    17-71#   17-72    17-72#   17-74    17-74    17-74    17-74    17-74    17-74
        17-74    17-74    17-74    17-74    17-74#   17-74#   17-74#   17-74#   17-74#   17-74#   17-74#   17-74#
        17-82    17-82    17-82    17-82#   17-83    17-83    17-83    17-83#   19-18#   19-19    19-21    19-69
        19-69    19-69    19-69    19-69    19-69    19-69    19-69    19-69    19-69#   19-69#   19-69#   19-69#
        19-69#   19-69#   19-69#   19-69#   19-69#
S110     3-393#
S1200    3-398#
S134.5   3-394#
S150     3-395#
S1800    3-399#
S19200   3-406#
S2000    3-400#
S2400    3-401#
S300     3-396#
S3600    3-402#
S4800    3-403#
S50      3-391#
S600     3-397#
S7200    3-404#
S75      3-392#
S9600    3-405#    8-137
SASECT   1-48      9-6#
SCHED    1-139     3-44     21-185
SCPFHD   1-51      3-101#
SD$HLD   1-134
SDBULS   1-91     15-691#
SDCB     1-54     15-691#
SDCBND   1-54     15-691#
SDCBSZ   1-91     15-691    15-691#
SEGBLK   3-34     15-75#
SEGCHN   1-90      3-62#
SETERR   1-134
SFCB     1-68      3-87#
SFCBFH   1-53      3-89#
SFCBND   1-68      3-88#
SFCLS    1-125     3-166#
SFRSST   1-124     3-160#
SFSVST   1-124     3-159#
SFWRIT   1-125     3-167#
SHRRCB   1-51      3-93#
SHRRCN   1-51      3-94#
SILSIZ  17-15#   17-20    17-22#   17-27    17-29#   17-34    17-42#   17-47    17-51#   17-56    17-60#   17-65
        17-69#   17-74
SILXOF  17-15#   17-20    17-22#   17-27    17-29#   17-34    17-42#   17-47    17-51#   17-56    17-60#   17-65
        17-69#   17-74
SILXON  17-15#   17-20    17-22#   17-27    17-29#   17-34    17-42#   17-47    17-51#   17-56    17-60#   17-65
        17-69#   17-74
SIZMEM   3-336     3-336     3-336     3-336     3-336#    3-336#
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SMONHD   1-48      3-86#
SMRSIZ   1-116     3-346#
SNBUX    1-89     15-691    15-691    15-691    15-691    15-691#
SNDBX    1-86      3-91     15-691#
SNMSHD   1-108     3-79#
SPLANM   1-91     15-691#
SPLBHD   1-53     15-691#
SPLBLK   1-55     15-13#
SPLCHN   1-101    15-691#
SPLDEV   1-54     15-691    15-691#
SPLDVN   1-54     15-691    15-691#
SPLNB    1-52     15-691    15-691    15-691#
SPLND    1-52     15-691    15-691    15-691#
SPLNF    1-52      3-90     15-691    15-691#
SPOLID   1-118     3-108#
SPSTAT   1-61      2-105#
SPUSR    1-99      2-70#
SR3FLG   1-115     3-210#
SRERR   17-15     17-15#    17-22     17-22#    17-29     17-29#    17-38     17-38#
SRTSIZ   1-116     3-348#
STATCH   3-195    15-478#
STPFLG   1-94      3-208#
SWAPFL   3-177    15-51#    17-10
SWDBLK   1-65     15-9#
SWPCHN   1-102     2-200#    2-219
SWPSLT   3-33     15-65#    17-10     17-10
SYCH0    1-95      2-43#
SYCH1    1-95      2-44#
SYCH10   1-96      2-51#
SYCH11   1-96      2-52#
SYCH12   1-96      2-53#
SYCH13   1-96      2-54#
SYCH14   1-97      2-55#
SYCH15   1-97      2-56#
SYCH16   1-97      2-57#
SYCH17   1-97      2-58#     2-210
SYCH2    1-95      2-45#
SYCH20   1-97      2-59#
SYCH3    1-95      2-46#
SYCH4    1-95      2-47#
SYCH5    1-95      2-48#
SYCH6    1-96      2-49#
SYCH7    1-96      2-50#
SYINDX   1-105     2-93#
SYNAME   1-106     3-112#
SYNCH    1-135     2-89
SYPSPR   1-47      3-220#
SYPSWD   1-47     15-406    15-406    15-406#
SYSCHN   1-95      2-42#     2-209
SYSDAT   1-98      2-63#     2-212
SYSDMP   3-175    15-153#
SYSGEN   1-105     2-96#
SYSPSS   9-177#   15-406#   21-160
SYSUPD   1-99      2-80#
SYSVER   1-99      2-79#
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SYTIMH   1-101     3-51#
SYTIML   1-101     3-52#
SYUNIT   1-99      2-71#
T       17-20     17-20#    17-27     17-27#    17-34     17-34#    17-47     17-47#    17-56     17-56#    17-65     17-65#
        17-74     17-74#    19-69     19-69     19-69     19-69#    19-69#    19-69#    20-25     20-25     20-25#    20-25#
TBR      1-57     17-10     17-10#    17-15     17-22     17-29
TECO     3-379#
TIMIN    3-22     15-413#
TIMLOC   3-23     15-428#
TIMOUT   3-24     15-421#
TIOBAS   1-82      3-74#
TK1CNT   1-65      3-55#
TK1SEC   1-65      3-53#
TK1VAL   1-103     3-54#
TK3SVL   1-111     3-57#
TK5VAL   1-111     3-56#
TMIDLH   1-107     3-235#
TMIDLL   1-107     3-236#
TMIOH    1-65      3-229#
TMIOL    1-65      3-230#
TMIOWH   1-66      3-233#
TMIOWL   1-66      3-234#
TMSWPH   1-66      3-231#
TMSWPL   1-66      3-232#
TMSWTH   1-107     3-227#
TMSWTL   1-107     3-228#
TMTOTH   1-106     3-223#
TMTOTL   1-106     3-224#
TMUSRH   1-106     3-225#
TMUSRL   1-106     3-226#
TNHL     1-49     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10     17-10
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        17-10     17-10     17-10     17-10     17-10     17-10#
TOTON    1-93      3-206#
TSDEFS   1-137     3-111
TSDHIO  21-34     21-37#
TSGEN    1-42#     1-48
TSLICH   3-190    15-459#
TSR      1-56     17-10     17-10#    17-15     17-22     17-29
TSXSIT   1-69      3-58#
TSXVEC   2-8#      2-37
TSXVRS   1-47      1-143#    2-21
TTCSCH   1-56      1-154#
TTOP     2-119#    2-215
TTOPTS   1-113     2-110     2-118#
U$CL     3-181    15-189#
UBUSMP   1-86      3-209#
UCLBLK   1-115     3-114#
UCLDAT   1-115    15-21#
UCLMNC   3-18     15-196#
UCLNAM   1-52      3-113#
UCLORD   3-182    15-207#
UKMNAM   1-54      3-115#
UMRBAS  19-85     19-96#
UMREND  19-85     19-105#
UMRWHD  19-85     19-86#
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UMSYTP   1-89      3-109#
UNIBUS   1-114     3-313#   19-97
USPLCH   1-86      1-225#
USRBAS   1-80      3-69#
USROFF   2-68#     2-214
USWPCH   1-119     1-227#   2-200
UXIFLG   3-180    15-141#
VBUSTP   1-114     3-178#
VCBBAS  21-6      21-7#
VCBEND  21-6      21-12#
VCORTM   1-83      3-11#
VCSHNB   1-66      3-40#
VCTRLT   1-71      3-195#
VCXCTL   1-75      3-194#
VCXTRM   1-75      3-193#
VDBFLG   1-118     3-185#
VDFMEM   1-108     3-32#
VDISPC   1-70      3-49#
VDMKTP   1-70      3-176#
VDMTCR   1-70      3-119#
VDOSPC   1-70      3-50#
VDSKBU   1-72      3-45#
VECBAS   1-108     2-37#    2-204    2-209    2-210    2-211    2-212    2-213    2-214    2-215    2-216    2-217
         2-218     2-219    2-220
VEDIT    1-64      3-196#
VERR    17-15     17-15#   17-22    17-22#   17-29    17-29#   17-38    17-38#
VH$BA1   1-77      3-295#
VH$BA2   1-77      3-296#
VH$BCR   1-77      3-297#
VH$CSR   1-76      3-290#
VH$DBR   1-76      3-291#
VH$LCR   1-77      3-294#
VH$LPR   1-76      3-292#
VH$LSR   1-76      3-293#
VHIMEM   1-103     3-31#
VHIPCT   1-94      3-12#
VHOINT  21-35     21-48#
VHSTOP  21-35     21-45#
VHSTRT  21-35     21-44#
VHXOFF  21-36     21-47#
VHXON   21-36     21-46#
VIDCSR   1-100     3-118#
VINABT   1-63      3-179#
VINTIO   1-89      3-13#
VKEYMX   1-72      3-38#
VLDSYS   1-60      3-183#
VLSWCH   3-191    15-465#
VMAXMC   1-80      3-27#
VMIOBF   1-81      3-197#
VMIOSZ   1-79      3-198#
VMLBLK   1-90      3-17#
VMNUAO   1-47      3-200#
VMSCHR   1-79      3-28#
VMXCSH   1-85      3-98#
VMXFIL   1-108     3-19#
VMXMON   1-61      3-21#
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VMXMRB   1-80     3-30#
VMXMSG   1-80     3-29#
VMXSF    1-90     3-14#
VMXSFC   1-90     3-15#
VMXWIN   1-55     3-37#
VNCSLO   1-71     3-46#
VNCXOF   1-71     3-47#
VNCXON   1-71     3-48#
VNFCSH   1-85     3-20#
VNGR     1-51     3-35#
VNRFLG   1-69     3-42#
VNUIP    1-51     3-39#
VNUMDC   1-81     3-16#
VOFFTM   1-87     3-26#
VONTM    1-87     3-25#
VPLAS    1-90     3-34#
VPMSIZ   1-73     3-43#
VPRIDF   1-99     3-188#
VPRIHI   1-98     3-187#
VPRILO   1-98     3-186#
VPRIVR   1-64     3-189#
VQUAN0   1-73     3-4#
VQUAN1   1-83     3-5#
VQUAN2   1-83     3-9#
VQUAN3   1-73     3-10#
VQUN1A   1-83     3-6#
VQUN1B   1-83     3-7#
VQUN1C   1-69     3-8#
VSCHED   1-72     3-44#
VSLEDT   1-56     3-184#
VSWPFL   1-92     3-177#
VSWPSL   1-55     3-33#
VSYDMP   1-70     3-175#
VT100    1-136    17-18     17-26     17-33     17-44     17-53     17-62     17-71
VT200    1-136
VT52     1-136
VTMIN    1-87     3-22#
VTMLOC   1-87     3-23#
VTMOUT   1-87     3-24#
VTSLCH   1-73     3-190#
VU$CL    1-52     3-181#
VUCLMC   1-115    3-18#
VUCLOR   1-115    3-182#
VUSPHN   1-126    3-199#
VUXIFL   1-62     3-180#
VVLSCH   1-73     3-191#
VVPWCH   1-73     3-192#
W       13-7#    15-643
WILDFL   1-64    15-526#
WINBAS   1-80     3-71#
X       15-574   15-574#   15-575    15-575#   15-576    15-576#   15-577    15-577#   15-578    15-578#
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BUFSIZ    8-49#    19-69    19-69    19-69
CHNRES    2-26#     2-43     2-44     2-45     2-46     2-47     2-48     2-49     2-50     2-51     2-52     2-53
          2-54      2-55     2-56     2-57     2-58     2-59     2-192    2-192    2-192    2-192    2-192    2-192
          2-192     2-192    2-196
CLDEF     7-11#
CLEND     9-132#
CLTABL   21-82#    21-93    21-94    21-95    21-96    21-97    21-98    21-99    21-100   21-101   21-102   21-103
         21-104    21-105   21-106   21-107   21-108   21-109   21-110   21-111
CMDFIL    8-83#    17-17    17-25    17-32    17-45    17-54    17-63    17-72
DETACH    9-141#   17-82    17-83
DEVBEG    4-7#     15-572
DEVDEF    4-40#    15-574   15-575   15-576   15-577   15-578
DEVEND    4-109#   15-578
DHDEF    10-14#
DHUDEF   11-57#
DHVDEF   11-12#
DZDEF    12-44#
FLAGS     8-6#     17-19    17-24    17-31    17-46    17-55    17-64    17-73
LINDEF    7-58#    17-15    17-22    17-29    17-42    17-51    17-60    17-69
LINEND    9-8#     17-20    17-27    17-34    17-47    17-56    17-65    17-74    19-69    19-69    19-69
LINPRM    8-106#
MEMORY    3-319#    3-336
MUXDEF   12-12#    17-38
MUXEND   12-52#    17-76
MXTBL     3-253#    3-263    3-264    3-265    3-266    3-267    3-268    3-269    3-270    3-271    3-272    3-273
          3-274     3-275    3-276    3-277    3-278
NAME      8-29#    17-16    17-23    17-30    17-43    17-52    17-61    17-70
NOT      13-165#   15-691   15-691
OB        5-7#     17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10    17-10
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OR       13-169#
PAGE      8-73#
RTDEF     9-198#   20-25    20-25
SILO      8-63#
SPEED     8-139#
SPFLAG   13-48#    15-622
SPHOLD   13-124#   15-665
SPOOL    13-184#   15-691
SPWIDE   13-86#    15-643
SRCHK     8-198#   17-15    17-22    17-29    17-38
SYSPS     9-178#   15-406
TBLDEF    5-71#    17-10
TRMTYP    8-12#    17-18    17-26    17-33    17-44    17-53    17-62    17-71
UMRDEF   19-87#
VECCHK    8-183#   17-15    17-22    17-29    17-38
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