

```

1          .TITLE  TSGEN -- System Generation Parameters
2          .IDENT  /V6.3/
3 000000   .CSECT  TSGEN
4          .ENABL  LC
5          .DSABL  QBL
6          .NLIST  CND
7
8          ;-----
9          ; TSGEN version 6.3
10         ;
11         ; This module contains the the definitions of system parameters
12         ; that define the characteristics of the TSX-Plus system
13         ; being generated.
14         ;
15         ; Written by Phil Sherrod.
16         ;
17         ; Copyright (c) 1978,1979,1980,1981,1982,1983,1984,1985,1986,1987.
18         ; S&H Computer Systems, Inc.
19         ; 1027 17th. Avenue South
20         ; Nashville, Tennessee U. S. A.
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22         ;
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33         ;
34         ; S&H will seek legal redress for any unauthorized use of this product.
35         ;
36         ; Set FULLST to 1 for a full assembly listing.
37         ; Set FULLST to 0 for a normal short listing.
38         ;
39         ; 000001 FULLST = 1
40         ;
41         ; 000000 TSGEN:
42         ;
43         ; Global definitions
44         ;
45         ;
46         ; .GLOBL  MXTTCT, HANDSK, HANRCB, HANRCO
47         ; .GLOBL  IOHANQ, GETUMR, FREUMR, SYPSWD, SYPSPR, TSXVRS
48         ; .GLOBL  TSGEN, RDBSEC, DTYPE, NAMSEC, LNMTOP, SASECT, SMONHD
49         ; .GLOBL  NPL, NSL, NLIN2, LSTHL, TNHL, NIOL, FSTIOL
50         ; .GLOBL  NLINES, NLCHN, $MEMSZ, MEMPTR, PHYMEM, CFSTS, CFABLV
51         ; .GLOBL  VNGR, SHRCB, SHRCN, SCPFHD, VNUIP, INSTBL, INSTBN
52         ; .GLOBL  SPLND, SPLNF, SPLNB, VU$CL, UCLNAM, MIOBHD, DETCBS
53         ; .GLOBL  SPLBHD, SFCBFH, KMNTOP, KMNHI, NESB, FASTIN
54         ; .GLOBL  SDCB, SDCBND, SPLDEV, SPLDVN, UKMNAM, IOHLM
55         ; .GLOBL  NFRESB, SPLBLK, NSPLDV, VSWPSL, CLEOFS, VMXWIN
56         ; .GLOBL  INVEC, RSR, RBR, TSR, TTCSCH, VSLEDT, FRKINI, FRKGEN
57         ; .GLOBL  TBR, INRECV, OTRECV, LSTPL, LUNAME, LSTIOL, NUMFRK, NXIVMH
58         ; .GLOBL  QUAN1, QUAN2, LSTMX, R$TTOP, R$INST, LSTLIN, R$CFST

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59	. GLOBL	INMXV, OTMXV, PVSPBL, LMXLN, LMXPRM, NDVRCB
60	. GLOBL	OTRASZ, LNMAP, LNPRIM, LPRI, VLDSYS, NSPLFL, NSPLBL
61	. GLOBL	CLVERS, CLORSZ, VMXMON, MONFGH, SPSTAT, LDVERS
62	. GLOBL	NCSILO, NCXOFF, NCXON, CSHALC, VUXIFL
63	. GLOBL	LSTSL, FSTSL, CTRLTT, VINABT, IOABFL
64	. GLOBL	MAXSEC, VEDIT, WILDFL, VPRIVR, CLXTRA, CLTOTL
65	. GLOBL	SWDBLK, TMIOL, TMIOH, TK1CNT, TK1SEC, NSCP
66	. GLOBL	TMSWPL, TMSWPH, TMIOWL, TMIOWH, VCSHNB
67	. GLOBL	DCTOTU, DCTRD, DCCRD, DCTWR, DCCWR
68	. GLOBL	SFCB, SFCBND, QUAN1A, LOGCHN, QUAN1B
69	. GLOBL	TSXSIT, CFCHAN, NUCHN, MVSIZ, VQUN1C, VNRFLG
70	. GLOBL	VDISPC, VDOSPC, VDMKTP, VSYDMP, VDMTCR, MODDAT
71	. GLOBL	VNCSLO, VNCXOF, VNCXON
72	. GLOBL	CMFSEC, CMFTOP, VKEYMX, VSCHED, VDSKBU, MODTIM
73	. GLOBL	VTSLCH, MXSPAC, PMSIZE, VVLSCH, VQUANO, VQUAN3, VVPWCH
74	. GLOBL	MXRBUF, MXRING, MXBRK, MH\$SCR, MH\$RCR, MH\$CAR
75	. GLOBL	MH\$BCR, MH\$BAR, MH\$SSR, DHBFSZ, VCXTRM, VCXCTL
76	. GLOBL	VH\$CSR, VH\$DBR, VH\$LPR, VH\$LSR, RUNCHN
77	. GLOBL	VH\$LCR, VH\$BA1, VH\$BA2, VH\$BCR, CDX\$PI
78	. GLOBL	CDX\$DL, CDX\$DZ, CDX\$DH, CDX\$VH, CDX\$PC, CDX\$PP
79	. GLOBL	VMSCHR, VMIOSZ, RPRCSR, RPRVEC, DWTYPE, CDX\$QP
80	. GLOBL	VMAXMC, VMXMSG, MSGBAS, USRBAS, VMXMRB, WINBAS
81	. GLOBL	NUMDCD, VNUMDC, DCAGE, NUMCDB, VMIOBF
82	. GLOBL	LOKBAS, LOKMEM, TIOBAS, LOKCSH
83	. GLOBL	VQUAN1, VQUN1A, VQUN1B, VQUAN2, VCORTM
84	. GLOBL	MAPPAR, RDB, RDBEND, NUMRDB, MIODBG
85	. GLOBL	CSHDEV, CSHDVN, VMXCSH, VNFCSH, CSHHD
86	. GLOBL	MAXALC, ALCTBL, ALCEND, VOFFTM
87	. GLOBL	VTMOUT, SNDBX, USPLCH, UBUSMP, MEM256
88	. GLOBL	FREFRK, BOTDEV, BOTUNI, BOTCSR, MIOFLG
89	. GLOBL	AUTHAN, AHEND, SNBUX, UMSYTP, VINTIO
90	. GLOBL	VMXSF, VMXSF, VMLBLK, RSFBLK, VPLAS, SEGCHN
91	. GLOBL	SDCBSZ, SDBULS, SPLANM, MIONWB, INDFIL
92	. GLOBL	NDL, LSTD, FSTD, VSWPFL, MAPUSR, R\$MFMV
93	. GLOBL	CORUSR, LINNUM, MUXNUM, NUMON, PVON, TOTON
94	. GLOBL	STPFLG, MINTIM, RTVECT, VHIPCT, FRKDLY
95	. GLOBL	SYSCHN, SYCH0, SYCH1, SYCH2, SYCH3, SYCH4, SYCH5
96	. GLOBL	SYCH6, SYCH7, SYCH10, SYCH11, SYCH12, SYCH13
97	. GLOBL	SYCH14, SYCH15, SYCH16, SYCH17, SYCH20
98	. GLOBL	BLKEY, CHKEY, SYSDAT, DFLG, QCOMP, VPRILO, VPRIHI
99	. GLOBL	SPUSR, SYUNIT, SYSVER, SYSUPD, CONFIG, MAXBLK, VPRIDF
100	. GLOBL	PNAME, HANSIZ, HANENT, DVSTAT, PROSLT, VIDCSR
101	. GLOBL	DEVSIZ, MAXDEV, NUMDEV, SYTIML, SYTIMH, SPLCHN, HANIOC
102	. GLOBL	SWPCHN, NUMIOQ, NUMSYQ, FREIOQ, NMFREQ, INTSSZ
103	. GLOBL	MONVEC, TK1VAL, VHIMEM, CCLSAV, INDSAV
104	. GLOBL	INDDBL, INDTSV, INDDBS, R\$INTC
105	. GLOBL	SYINDX, CONFQ2, SYSGEN, MAXGVL, LDDEVX, CLDEVX, C1DEVX
106	. GLOBL	TMTOTL, TMTOTH, TMUSRL, TMUSRH, SYNAME
107	. GLOBL	TMSWTL, TMSWTH, TMIDLL, TMIDLH, NUMCCB
108	. GLOBL	VMXFIL, VECBAS, VDFMEM, SNMSHD, MXJADR
109	. GLOBL	NMSNMB, NMUMB, CORTIM, RF\$WRT, GENTOP
110	. GLOBL	BASMAP, LOMAP, HIMAP, FREPGS
111	. GLOBL	JCXPGS, MXJMEM, DFJMEM, TK5VAL, TK3SVL
112	. GLOBL	R\$CHN, R\$DATE, R\$UBAS, R\$JOB, R\$CH17
113	. GLOBL	R\$XCHN, EXTCHN, MVWDS, TTOPTS, MAPSIZ
114	. GLOBL	DVFLAG, VBUSTP, QBUS, UNIBUS
115	. GLOBL	VUCLMC, UCLDAT, UCLBLK, VUCLOR, SR3FLG

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116      .GLOBL  SMRSIZ, SRTSIZ, CSHSIZ, MIOWHD, MIOSYQ
117      .GLOBL  PROFLG, MPARFL, PIDPTR
118      .GLOBL  PROBRK, SPOLID, VDBFLG, PROODC
119      .GLOBL  HANPAR, MHNSIZ, KUSECK, USWPCH, R$SWPC
120      .GLOBL  CA$BLK, CA$DVU, CA$HBL, CA$HFL, CA$HSH, CA$UBL, CA$UFL, CA$WCT
121      .GLOBL  CSHBFP, CSHLRU, CSHMRU, CSHFHD, CCBHD
122      .GLOBL  CASTBR, CASCBR, CASTBW, CASCUP, CASTRO, CASTWO
123      .GLOBL  CSHID, CSHINI, CSHCLN, CSHFIN, CSHBAS, CSHVEC
124      .GLOBL  LOKVEC, LOKINI, DOOPAP, DOCOPN, SFSVST, SFRSST, DORLK
125      .GLOBL  DOTLK, DOCULK, DOULK1, DOSFCK, SFCLS, SFWRIT, CLSCDB
126      .GLOBL  DCRD1, DCRD2, LOKVEC, CLKVEC, VUSPHN, ABRTOV
127      ;
128      ; Global references
129      ;
130      .GLOBL  ININT, DLINT, LINNUM, PROITP, FNDHRB
131      .GLOBL  SD$HLD, MUXNUM, RMNBAS, SETERR
132      .GLOBL  IOFIN, INTEN, PSW, SYNCH
133      .GLOBL  LA36, LA120, VT52, VT100, ADM3A, VT200
134      .GLOBL  DIABLO, QUME, HAZEL, TSDEFS, EXTP1, HANXMR, BLKMOV, CVTPHY
135      .GLOBL  GETRTQ, QFREE, IOSTRT, FRKGET, FORKQ, QIO, QCOMPL
136      .GLOBL  SCHED, DSKBUF, IOQSIZ

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1      ; -----
2      ;   Internal parameters
3      ;
4      001166      TSXVRS =      630.      ;TSX-Plus version number
5      000010      MAXDEV =      8.        ;Max number of devices that can be supported
6      000031      NUMFRK =     25.        ;# Fork request blocks
7      000000      NXIVMH =      0.        ;# extra interrupt vectors for mapped handlers
8      000120      DETCBS =     80.        ;# characters for detached job startup cmd.
9      000004      FRKGEN =      4.        ;# Fork blocks in TSGEN
10     000004      NMSNMB =      4.        ;# System message buffers
11     000002      NMSYMB =      2.        ;# message buffer reserved for system use
12     000024      NUCHN =     20.        ;# I/O channels user may use
13     000001      MAXMUX =      1.        ;Max # of DZ11's, DH11's, and DHV11's
14     000040      DHBFSZ =     32.        ;# bytes for DH11 and DHV11 DMA output buffers
15     000012      TTCSCH =     10.        ;# characters printed per scheduler check
16     000020      NUMIOQ =     16.        ;# I/O queue elements
17     000006      NUMSYQ =      6.        ;# I/O queue elements reserved for system I/O
18     000012      NUMCCB =     10.        ;# data cache control blocks
19     000006      NSCP  =      6.        ;# swapper command packets
20     000454      INTSSZ =    300.        ;# bytes for system interrupt stack
21     000002      MIONWB =      2.        ;Number of mapped I/O wait queue elements
22     000000      MIODBG =      0.        ;1=Force I/O mapping (debugging use only)
23     000000      MPARFL =      0.        ;1==>Enable mem parity traps, 0==>disable.
24     000000      PROBRK =      0.        ;1==>Enable ODT break on PRO printer port
25     000003      PROODC =      3.        ;Clock ticks per PI driver call
26     000000      FASTIN =      0.        ;1==>Clock driven input character processing
27     000100      CLKVEC =     100        ;Clock interrupt vector
28     000006      DCAGE =      6.        ;Shared file data cache ageing factor
29     000001      KUSECK =      1.        ;0==>Don't check for usage on INIT & SQUEEZE.
30     000024      IOHLM =     20.        ;# 0.1 secs I/O can be held for job swapping
31     000007      CLEDFS =      7.        ;Max num of chars in CL ENDSTRING parameter
32     000002      NDRTDF =      2.        ;Number of dummy shared run-time definitions
33     000000      $PRIV =      0         ;Obsolete line-def privilege flag
34     000020      $NOVLN =     20        ;Obsolete no-virtual-line privilege flag
35     ;
36     ; -----
37     ;   Fork priority values.
38     ;   Unlike RT-11, TSX-Plus assigns priority values to its fork requests
39     ;   and allows higher priority fork requests to interrupt lower priority ones.
40     ;   The priority values range from 1 to 127.  The higher the numerical value,
41     ;   the higher the priority.
42     ;
43     . GLOBL  FP$RT, FP$CKT, FP$DEF, FP$IOS, FP$IOF, FP$IOA, FP$MOV
44     . GLOBL  FP$CDI, FP$CDO, FP$CK1, FP$MAX, FP$FLG, FP$PIO
45     ;
46     100000      FP$FLG =     100000      ;Flag saying this is a priority value
47     100177      FP$MAX =     FP$FLG+127. ;Max legal fork priority
48     100144      FP$RT  =     FP$FLG+100. ;Real-time interrupts
49     100106      FP$CKT =     FP$FLG+70.  ;50/60 Hz clock interrupt processing
50     100074      FP$CDI =     FP$FLG+60.  ;Terminal character input processing
51     100067      FP$CDO =     FP$FLG+55.  ;Terminal character output processing
52     100062      FP$DEF =     FP$FLG+50.  ;Default fork priority
53     100062      FP$IOF =     FP$FLG+50.  ;I/O finish
54     100062      FP$IOA =     FP$FLG+50.  ;I/O abort entry
55     100062      FP$PIO =     FP$FLG+50.  ;PI output interrupt processing
56     100036      FP$CK1 =     FP$FLG+30.  ;0.1 second clock processing
57     ; The following fork priorities are entered from a non-interrupt state.

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58      100014      FP$IOS =      FP$FLG+12.      ; I/O initiation
59      100012      FP$MOV =      FP$FLG+10.      ; Move data to/from cache buffer
60
61      ;
62      ; -----
63      ; Completion routine class priorities.
64      ; A completion routine with a higher (numerically larger) class priority
65      ; is allowed to interrupt a lower class priority completion routine.
66      ;
67      ; . GLOBL CP$STD, CP$RT, CP$SYN
68      000001      CP$STD =      1              ; Standard -- I/O completion, .TIMIO, etc.
69      000002      CP$RT  =      2              ; Real-time completion routine
70      000003      CP$SYN =      3              ; .SYNCH completion routine
71      ;
72      ; Type codes used to identify communication device controllers
73      ;
74      000000      CDX$DL =      0              ; DL11
75      000002      CDX$DZ =      2              ; DZ11
76      000004      CDX$DH =      4              ; DH11
77      000006      CDX$VH =      6              ; DHV11
78      000010      CDX$PI =      10             ; Console terminal on Professional
79      000012      CDX$PC =      12             ; Communications port on Professional
80      000014      CDX$PP =      14             ; Printer port on Professional
81      000016      CDX$QP =      16             ; 4 line Multiplexer on Professional
82      ; -----
83      000024      CFCHAN =      NUCHN          ; Channel to use for command file input
84      000025      LOGCHN =      NUCHN+1      ; Channel for log file
85      000026      USPLCH =      NUCHN+2      ; Channel to use to write to spool file
86      000027      RUNCHN =      NUCHN+3      ; Channel to use when loading a SAV file
87      000030      USWPCH =      NUCHN+4      ; Channel to use to access swap file
88      000031      NLCHN  =      NUCHN+5      ; Total # channels allocated per job
89      000000      LSTMX  =      0              ; Index to last mux
90      000000      CURMX  =      0              ; Current mux #
91      000000      NUMRDB =      0              ; Count number of shared run-times declared
92      000000      CURCDX =      CDX$DL        ; Comm device type for current line
93      000000      DHUSE  =      0              ; Set to 1 if DH11 or DHV11 support needed

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1          ; -----
2          ; Monitor fixed-offset value vector
3          ;
4          ; Table of addresses of TSX-Plus routines. The pointer to this vector is
5          ; stored at simulated RMON offset -2.
6          ;
7 000000 002062' TSXVEC: .WORD  NUMDEV      ; 0 Ptr to word with # devices in system
8 000002 000560'      .WORD  HANENT      ; 2 Vector with handler entry points
9 000004 000702'      .WORD  HANPAR      ; 4 64-byte phys mem base of mapped handlers
10 000006 000000G     .WORD  GETRTQ     ; 6 Routine to get a free I/O queue element
11 000010 000000G     .WORD  QFREE      ; 10 Routine to free an I/O queue element
12 000012 000000G     .WORD  QIO       ; 12 Routine to queue an I/O request
13 000014 000000G     .WORD  IDSTRT    ; 14 Routine to requeue an I/O request
14 000016 000000G     .WORD  QCOMPL    ; 16 Routine to queue a completion request
15 000020 000000G     .WORD  FRKGET    ; 20 Routine to get a fork request block
16 000022 000000G     .WORD  FORKQ     ; 22 Routine to queue a fork request
17 000024 000000G     .WORD  IOHANDQ   ; 24 Place I/O queue element on handler list
18 000026 000000G     .WORD  GETUMR    ; 26 Allocate a Unibus map register
19 000030 000000G     .WORD  FREUMR    ; 30 Free a Unibus map register
20 000032 001166      .WORD  TSXVRS    ; 32 TSX-Plus version number
21 000034 000000G     .WORD  IOQSIZ    ; 34 Size of an I/O queue element (bytes)
22          ;
23          ; Macro to reserve I/O channel space.
24          ;
25          .MACRO  CHNRES
26          .WORD  0,0,0,0,0
27          .ENDM  CHNRES
28          ;
29          ; -----
30          ; Fixed-offset vector
31          ;
32          ; The following vector of addresses and values corresponds to the fixed
33          ; offset cells in RT-11 RMON. These cells are mapped into user
34          ; address space through PAR7 (160000 - 177777).
35          ;
36 000036 000000' VECBAS: .WORD  TSXVEC      ; -2 Pointer to vector of TSX addresses
37 000040 000167 000000G MONVEC: JMP  INTEN      ; 0 Handler interrupt entry point
38          ;
39          ; System channel space
40          ;
41 000044          SYSCHN:
42 000044          SYCH0:  CHNRES
43 000056          SYCH1:  CHNRES
44 000070          SYCH2:  CHNRES
45 000102          SYCH3:  CHNRES
46 000114          SYCH4:  CHNRES
47 000126          SYCH5:  CHNRES
48 000140          SYCH6:  CHNRES
49 000152          SYCH7:  CHNRES
50 000164          SYCH10: CHNRES
51 000176          SYCH11: CHNRES
52 000210          SYCH12: CHNRES
53 000222          SYCH13: CHNRES
54 000234          SYCH14: CHNRES
55 000246          SYCH15: CHNRES
56 000260          SYCH16: CHNRES
57 000272          SYCH17: CHNRES

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58 000304          SYCH20: CHNRES
59                ;
60 000316 000000   BLKEY:  .WORD  0          ;256 - # of directory block that is in core
61 000320 000000   CHKEY:  .WORD  0          ;260 - # of device whose dir block is in core
62 000322 000000   SYSDAT: .WORD  0          ;262 - System date word
63 000324 000000   DFLG:   .WORD  0          ;264 - Directory op is in progress
64                ;
65                ; The following cells are documented for access by .GVAL
66                ;
67 000326 000100   USROFF: .WORD  HIMEM       ;266 - Base of USR
68 000330 0000000  QCOMP:  .WORD  IOFIN       ;270 - I/O completion handler entry point
69 000332 000000   SPUSR:  .WORD  0          ;272 - USR error cell
70 000334 000000   SYUNIT: .WORD  0          ;274 - Unit # of SY device
71 000336      004   SYSVER: .BYTE  4          ;276 - System version number
72 000337      000   SYSUPD: .BYTE  0          ;277 - Release #
73 000340 000000   CONFIG: .WORD  0          ;300 - System configuration word
74 000342          .BLKW  5          ;302 - 313 (unused)
75 000354 001750   MAXBLK: .WORD  MAXFIL      ;314 - Largest output file size
76                ; Word 316 in TSX-Plus is reserved for specific use. It must
77                ; be initialized to zero and not used by the operating system.
78                ; See the note in TSDEFS for more specific information.
79 000356 000000 000000 .WORD  0,0          ;316 - 321 unused
80 000362 000000   CORUSR: .WORD  0          ;322 - Current job number
81 000364 0000000  .WORD  SYNCH         ;324 - Address of .SYNCH request routine
82 000366          .BLKW  13         ;326 - 357 unused
83 000420 000445   BR      MTPS         ;360 - Move to PS routine
84 000422 000432   BR      MFPS         ;362 - Move from PS routine
85 000424 000000   SYINDX: .WORD  0          ;364 - Device number of system device
86 000426 000000   CFSTS:  .WORD  0          ;366 - Command file status flags
87 000430 000000   CONFG2: .WORD  0          ;370 - Extended configuration word
88 000432 000000   SYSGEN: .WORD  0          ;372 - System generation options
89 000434 000002   .WORD  2          ;374 - Size of USR
90 000436      014   CFABLV: .BYTE  14         ;376 - Error abort severity level
91 000437      003   .BYTE  3          ;377 - Max @file nesting level
92 000440 000000   EMTRTN: .WORD  0          ;400 - EMT return point
93 000442 000000   FRKADR: .WORD  0          ;402 - Fork routine
94 000444 000500   PNPTR:  .WORD  PNAME-MONVEC ;404 - Offset to permanent dev name table
95 000446 071677 142615 MONAME: .RAD50 /RT11XM/ ;406 - 410 - System name
96 000452 000000   HSUFFIX: .WORD  0          ;412
97 000454 000000   SPSTAT: .WORD  0          ;414 - Spooler status flags
98 000456      000   .BYTE  0          ;416 - Error byte for IND
99 000457      000   INSTA:  .BYTE  0          ;417 - IND status byte
100 000460 000000  $MEMSZ: .WORD  0          ;420 - Total 32-word mem blocks avail
101 000462 000000   .WORD  0
102 000464 0004420  $TCFIG: .WORD  TTOPTS+RMNBAS ;424 - Address of TT config word
103 000466 0004440  $INDDV: .WORD  INDOFF+RMNBAS ;426 - Pointer to IND device name word
104 000470 001102   MEMPTR: .WORD  HNMEPT-MONVEC ;430 - Offset to memory control blocks
105 000472 001132'  P1EXT:  .WORD  P1XPTR         ;432 - Kernel PAR1 routine
106 000474 000000   RPRCSR: .WORD  0          ;434 - Get CSR address of PRO devices
107 000476 000000   RPRVEC: .WORD  0          ;436 - Get vector address of PRO devices
108 000500 000000   DWTYPE: .WORD  0          ;440 - Type of DW disk
109                ; Dummy cell corresponding to cell in RT-11 with TT option flags.
110                TTOPTS = .-MONVEC ;Offset to TTOPTS cell
111 000502 000000   TTOP:  .WORD  0          ;TTOPTS cell
112                ; Cell with name of IND RUN device
113                INDOFF = .-MONVEC ;Offset to INDDEV cell
114 000504      123      131      060  INDDEV: .ASCII /SYO:/ ;Default device from which IND is run

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000507      072
115          ; -----
116          ; MFPS is called to return on the stack the contents of the low-order
117          ; byte of the processor status word.
118          ; Note: This only works when used within handlers. If a .MFPS macro
119          ; is used in a TSX-Plus user job, a value of zero is returned.
120          ;
121          ; Outputs:
122          ; Processor status word is on top of stack.
123          ;
124 000510    005046 MFPS:   CLR      -(SP)
125 000512    013716 0000000 MFPMOV: MOV     @#PSW,(SP) ;Get the psw (** patched during job init **)
126 000516    016646 000002   MOV     2(SP),-(SP) ;Now push return address on top
127 000522    016666 000002 000004 MOV     2(SP),4(SP) ;Move down PS value
128 000530    012616   MOV     (SP)+,(SP) ;Move down return address
129 000532    000207   RETURN
130          ;
131          ; MTPS is called to set the value of the low-order byte of the
132          ; processor status word.
133          ;
134          ; Inputs:
135          ; Value to be moved to psw is on top of stack before call.
136          ;
137          ; Outputs:
138          ; Value is moved to psw and popped from the stack.
139          ;
140 000534    000006 MTPS:   RTT                      ;PC&PS are on stack, let RTT set PS and return
141          ;
142          ; -----
143          ; Device and handler information tables (Do not change the order).
144          ;
145          ; *** VM depends on PHYMEM being 1 word below PNAME ***
146          ;
147 000536    000000 PHYMEM: .WORD   0 ;*** Store actual physical memory size ***
148 000540    000010 PNAME:  .REPT  MAXDEV ;Table of permanent device names (Rad50)
149          .WORD   0
150          .ENDR
151 000560    000010 HANENT: .REPT  MAXDEV ;Handler entry point
152          .WORD   0
153          .ENDR
154 000600    177777   .WORD  -1 ;Flag to mark end of HANENT table
155 000602    000010 DVSTAT: .REPT  MAXDEV ;Device status flags
156          .WORD   0
157          .ENDR
158 000622    000010 HANDSK: .REPT  MAXDEV ;Location of handler on the disk
159          .WORD   0
160          .ENDR
161 000642    000010 HANSIZ: .REPT  MAXDEV ;Size of device handler
162          .WORD   0
163          .ENDR
164 000662    000010 DEVSIZ: .REPT  MAXDEV ;# 256-word blocks on device
165          .WORD   0
166          .ENDR
167 000702    000010 HANPAR: .REPT  MAXDEV ;64-byte base block for handler if mapped
168          .WORD   0
169          .ENDR
170 000722    000010 HANIOC: .REPT  MAXDEV ;# uncompleted I/O requests for handler

```

```

171          .WORD      0
172          .ENDR
173 000742  000010  DVFLAG: .REPT      MAXDEV          ;Table of device characteristics
174          .WORD      0
175          .ENDR
176          000722  MAXGVL  =      .-MONVEC          ;Max offset allowed with .GVAL
177          ;-----
178          ;
179          ; Reserve space for extended channel space
180          ;
181 000762  000010  EXTCHN:  .REPT      <NLCHN-17.>
182          .CHNRES
183          .ENDR
184          ;
185          ; Reserve space for channel used to access INDTMP file
186          ;
187          ;
188 001102  CHNRES          ;Channel used for I/O to INDTMP file
189          ;
190          ; Address of channel block for swap file access
191          ;
192          001070'  SWPCHN  =      EXTCHN+<10.*<USWPCH-17.>>
193          ;
194          ; End of MONVEC pointer table area.
195          ;
196          001056  MVSIZ   =      .-VECBAS
197          000427  MVWDS   =      MVSIZ/2          ;# words in mon vector table
198          ;
199          ; Define offsets into monitor vector area
200          ;
201          000006  R$CHN   =      SYSCHN-VECBAS    ;Start of channel space
202          000234  R$CH17  =      SYCH17-VECBAS   ;Offset to channel # 17
203          000724  R$XCHN  =      EXTCHN-VECBAS   ;Offset to extended channel space
204          000264  R$DATE   =      SYSDAT-VECBAS   ;Offset to date word
205          000324  R$JOB    =      CORUSR-VECBAS   ;Offset to job number cell
206          000270  R$UBAS   =      USROFF-VECBAS   ;Offset to usr base address cell
207          000444  R$TTOP   =      TTOP-VECBAS    ;Offset to TT option word
208          000421  R$INST   =      INSTA-VECBAS    ;Offset to IND status byte
209          000370  R$CFST   =      CFSTS-VECBAS    ;Offset to command file status word
210          001044  R$INTC   =      INDTSV-VECBAS   ;Offset to INDTMP channel block
211          001032  R$SWPC   =      SWPCHN-VECBAS   ;Offset to USWPCH channel block
212          000454  R$MFMV   =      MFPMOV-VECBAS   ;Offset to MFPMOV instruction
213          ;
214          ;-----
215          ; Vector of entry points to handler support routines
216          ; (Do not alter the order)
217          ;
218 001114  000167  000000G  JMP      CVTPHY          ;Routine to convert virtual to physical addr
219 001120  000167  000000G  JMP      FNDHRB          ;Routine to search for RCB for handler
220 001124  000167  000000G  JMP      HANXMR          ;Routine to allocate XM region for handler
221 001130  000402  BR        BMJMP            ;Routine to do block move
222 001132  000167  000000G  PIXPTR: JMP      EXTP1          ;Routine to execute mapped code
223 001136  000167  000000G  BMJMP:  JMP      BLKMOV
224          ;
225          ;-----
226          ; Memory allocation information for handlers
227          ;

```

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

```

1 ;-----
2 ; Misc data cells
3 ;
4 001150 000002 VQUANO: .WORD QUANO
5 001152 000024 VQUAN1: .WORD QUAN1
6 001154 000002 VQUN1A: .WORD QUAN1A
7 001156 000002 VQUN1B: .WORD QUAN1B
8 001160 000001 VQUN1C: .WORD QUAN1C
9 001162 000012 VQUAN2: .WORD QUAN2
10 001164 000024 VQUAN3: .WORD QUAN3
11 001166 000002 VCORTM: .WORD CORTIM
12 001170 000050 VHIPCT: .WORD HIPRCT
13 001172 000036 VINTIO: .WORD INTIOC
14 001174 000062 VMXSF: .WORD MAXSF
15 001176 000144 VMXSFC: .WORD MAXSFC
16 001200 000000 VNUMDC: .WORD NUMDC
17 001202 000003 VMLBLK: .WORD MXLBLK
18 001204 000024 VUCLMC: .WORD UCLMNC
19 001206 001750 VMXFIL: .WORD MAXFIL
20 001210 000074 VNFCSH: .WORD NMFCSH
21 001212 000005 VMXMON: .WORD MAXMON
22 001214 000170 VTMOU: .WORD TIMEOUT
23 001216 000074 VOFFTM: .WORD OFFTIM
24 001220 000005 VMAXMC: .WORD MAXMC
25 001222 000310 VMSCHR: .WORD MSCHRS
26 001224 000006 VMXMSG: .WORD MAXMSG
27 001226 000005 VMXMRB: .WORD MAXMRB
28 001230 000100 VHIMEM: .WORD HIMEM
29 001232 000100 VDFMEM: .WORD DFLMEM
30 001234 000012 VSWPSL: .WORD SWPSLT ;# of job slots in swap file
31 001236 000764 VPLAS: .WORD SEGBLK ;# blocks for PLAS swap file
32 001240 000014 VNGR: .WORD NGR ;Number of global PLAS regions
33 001242 000004 NDVRCB: .WORD DEVXMR ;Number of PLAS regions for device handlers
34 001244 000012 VMXWIN: .WORD MAXWIN ;Maximum number of display windows
35 001246 000007 VKEYMX: .WORD KEYMAX ;Maximum # user-defined keys
36 001250 000004 VNUIP: .WORD NUIP ;Number of user programs that may be INSTALLED
37 001252 000454 VCSHNB: .WORD CACHE ;# blocks in use for generalized data cache
38 001254 000454 CSHALC: .WORD CACHE ;# blocks allocated for generalized data cache
39 001256 040150 VNRFLG: .WORD NRMFLG ;Default time-sharing line flags
40 001260 000000G VSCHED: .WORD SCHED ;An entry point in TSEXEC
41 001262 000000G VDSKBU: .WORD DSKBUF ;A global from TSINIT
42 001264 000062 VNCSLD: .WORD NCSILO ;Default #bytes for TT and CL silos
43 001266 014 VNCXOF: .BYTE NCXOFF ;Default XOFF when only this many free
44 001267 004 VNCXON: .BYTE NCXON ;Default XON when this many remain
45 001270 000276 VDISPC: .WORD DINSPC ;Default line input buffer size
46 001272 000360 VDOSPC: .WORD DOTSPC ;Default line output buffer size
47 001274 000000 SYTIMH: .WORD 0 ;High-order system time word
48 001276 000000 SYTIML: .WORD 0 ;Low-order system time word
49 001300 000000 TK1SEC: .WORD 0 ;# clock ticks per second
50 001302 000000 TK1VAL: .WORD 0 ;# clock ticks per 0.1 second
51 001304 000000 TK1CNT: .WORD 0
52 001306 000000 TK5VAL: .WORD 0 ;# clock ticks per 0.5 seconds
53 001310 000000 TK3SVL: .WORD 0 ;# clock ticks per 3 seconds
54 001312 000000 TSXSIT: .WORD 0
55 001314 000000 FRKDLY: .WORD 0 ;Max clock ticks a fork request was delayed
56 001316 000000 CTRLTT: .WORD 0 ;# of operator's console
57 001320 000000 MINTIM: .WORD 0 ;Number of minutes of system up-time

```

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

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112 001550 000000 PIDPTR: .WORD 0 ;Pointer to clock-driven PI handler routine
113 001552 PROSLT: .BLKW 9 ;ID # of device in each PRO option slot
114 001574 000000 VIDCSR: .WORD 0 ;Address of PRO video CSR
115 001576 177564 VDMTCR: .WORD DMPTCR ;Transmitter control reg addr for dump device
116 001600 000000 MODDAT: .WORD 0 ;Date last modified by TSXMOD
117 001602 000000 MODTIM: .WORD 0 ;Time (3-sec) last modified by TSXMOD
118 001604 000000 HANRCB: .WORD 0 ;Pointer to start of handler RCB area
119 ;
120 ; Data for generalized data cache
121 ;
122 001606 000000 CA$BLK: .WORD 0 ;Block number associated with cache entry
123 001610 000000 CA$DVU: .WORD 0 ;Device and unit # associated with entry
124 001612 000000 CA$WCT: .WORD 0 ;Number of words in entry
125 001614 000000 CA$UFL: .WORD 0 ;LRU chain forward link
126 001616 000000 CA$UBL: .WORD 0 ;LRU chain backward link
127 001620 000000 CA$HFL: .WORD 0 ;Hash chain forward link
128 001622 000000 CA$HBL: .WORD 0 ;Hash chain backward link
129 001624 000000 CA$HSH: .WORD 0 ;Hash chains list head vector
130 001626 000000 CSHBFP: .WORD 0 ;64-byte block number of buffer area
131 001630 000000 CSHLRU: .WORD 0 ;Pointer to least-recently-used entry
132 001632 000000 CSHMRU: .WORD 0 ;Pointer to most-recently-used entry
133 001634 000000 CSHFHD: .WORD 0 ;Head of cache block free list
134 001636 000000 CCBHD: .WORD 0 ;Head of cache control block free list
135 001640 000000 000000 CASTRO: .WORD 0,0 ;Total # reads from mounted devices
136 001644 000000 000000 CASTBR: .WORD 0,0 ;Total # blocks read from mounted devices
137 001650 000000 000000 CASCBR: .WORD 0,0 ;Number of blocks that were read from cache
138 001654 000000 000000 CASTWO: .WORD 0,0 ;Total # writes to mounted devices
139 001660 000000 000000 CASTBW: .WORD 0,0 ;Total # blocks written to mounted devices
140 001664 000000 000000 CASCUP: .WORD 0,0 ;Number of blocks moved into data cache
141 ; Entry point vector for caching module
142 001670 CSHVEC:
143 001670 000000 CSHINI: .WORD 0 ;-
144 001672 000000 CSHIO: .WORD 0 ;-
145 001674 000000 CSHCLN: .WORD 0 ;-
146 001676 000000 CSHFIN: .WORD 0 ;-
147 001700 177777 .WORD -1 ;- End of pointer vector
148 ;
149 ; Entry point vector for record locking module
150 ;
151 001702 LOKVEC:
152 001702 000000 LOKINI: .WORD 0 ;-
153 001704 000000 DOOPAP: .WORD 0 ;-
154 001706 000000 DOOPN: .WORD 0 ;-
155 001710 000000 SFSVST: .WORD 0 ;-
156 001712 000000 SFRSST: .WORD 0 ;-
157 001714 000000 DORLK: .WORD 0 ;-
158 001716 000000 DOTLK: .WORD 0 ;-
159 001720 000000 DOCULK: .WORD 0 ;-
160 001722 000000 DOULK1: .WORD 0 ;-
161 001724 000000 DOSFCK: .WORD 0 ;-
162 001726 000000 SFCLS: .WORD 0 ;-
163 001730 000000 SFWRIT: .WORD 0 ;-
164 001732 000000 CLSCDB: .WORD 0 ;-
165 001734 000000 DCRD1: .WORD 0 ;-
166 001736 000000 DCRD2: .WORD 0 ;-
167 001740 177777 .WORD -1 ;- End of pointer vector
168 ;

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169           ; Misc byte data
170           ;
171 001742     000     VSYDMP: .BYTE   SYSDMP           ;Generate dump on crash if non-zero
172 001743     000     VDMKTP: .BYTE   DMPKTP           ;Crash on any kernel trap if non-zero
173 001744     001     VSWPFL: .BYTE   SWAPFL
174 001745     001     VBUSTP: .BYTE   BUSTYP
175 001746     000     VINABT: .BYTE   INIABT
176 001747     000     VUXIFL: .BYTE   UXIFLG
177 001750     001     VU$CL:  .BYTE   U$CL
178 001751     002     VUCLOR: .BYTE   UCLORD
179 001752     001     VLDSYS: .BYTE   LDSYS
180 001753     001     VSLEDT: .BYTE   SLEDIT
181 001754     000     VDBFLG: .BYTE   DBGFLG
182 001755     023     VPRILO: .BYTE   PRILOW
183 001756     120     VPRIHI: .BYTE   PRIHI
184 001757     062     VPRIDF: .BYTE   PRIDEF
185 001760     012     VPRIVR: .BYTE   PRIVIR
186 001761     035     VTSLCH: .BYTE   TSLICH
187 001762     027     VVLSCH: .BYTE   VLSWCH
188 001763     002     VVPWCH: .BYTE   PWCH
189 001764     034     VCXTRM: .BYTE   CCXTRM
190 001765     001     VCXCTL: .BYTE   CCXCTL
191 001766     003     VEDIT:  .BYTE   EDITOR
192 001767     000     VMIOBF: .BYTE   MIONBF
193 001770     017     VMIOSZ: .BYTE   MIOBSZ
194 001771     000     VUSPHN: .BYTE   PHONE           ;0=local if no DCD;1=always mon DCD if $phone
195 001772     000     MAPUSR: .BYTE   0             ;Number of job memory mapping is set up for
196 001773     000     LINNUM: .BYTE   0
197 001774     000     MUXNUM: .BYTE   0
198 001775     000     NUMON:  .BYTE   0
199 001776     000     PVON:   .BYTE   0
200 001777     000     TOTON:  .BYTE   0
201 002000     000     PROFLG: .BYTE   0             ;Non-zero ==> Running on PRO-350
202 002001     000     STPFLG: .BYTE   0
203 002002     000     UBUSMP: .BYTE   0             ;1==>Do Unibus mapping
204 002003     000     SR3FLG: .BYTE   0             ;NON-ZERO==>MEMORY MANAGEMENT REG 3 PRESENT
205 002004     000     MEM256: .BYTE   0             ;Non-zero==>machine has at least 256kb
206 002005     000     MIOFLG: .BYTE   0             ;Non-zero==>I/O mapping needed for some device
207 002006     000     NSPLDV: .BYTE   0             ;Number of installed spooled devices
208 002007     000     CLVERS: .BYTE   CLVRSN          ;CL handler version number
209 002010     000     LDVERS: .BYTE   0             ;LD translation table format (1<RTV5.4=<2)
210 002011     041     200     SYSPSR: .ASCII  /!/<200>    ;Prompt for system password
211           .EVEN
212           ; System time counters
213 002014     000000   TMTOTH: .WORD   0             ;Total uptime (0.1 second units)
214 002016     000000   TMTOTL: .WORD   0
215 002020     000000   TMUSRH: .WORD   0             ;Time spent in user jobs
216 002022     000000   TMUSRL: .WORD   0
217 002024     000000   TMSWTH: .WORD   0             ;Swap-wait time
218 002026     000000   TMSWTL: .WORD   0
219 002030     000000   TMIOH:  .WORD   0             ;Time user i/o is active
220 002032     000000   TMIOL:  .WORD   0
221 002034     000000   TMSWPH: .WORD   0             ;Time swapping is active
222 002036     000000   TMSWPL: .WORD   0
223 002040     000000   TMIOWH: .WORD   0             ;Time system is doing i/o-wait
224 002042     000000   TMIDWL: .WORD   0
225 002044     000000   TMIDLH: .WORD   0             ;Idle time

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226 002046 000000      TMIDLL: .WORD  0
227                      ;
228                      ; Shared file data cache statistics counters
229                      ;
230 002050 000000      DCTOTU: .WORD  0          ;Total number of cache hits since last divisn
231 002052 000000      DCTRD:  .WORD  0          ;Total number of reads from shared files
232 002054 000000      DCCRD:  .WORD  0          ;Number of reads satisfied by data in cache
233 002056 000000      DCTWR:  .WORD  0          ;Total number of writes to shared files
234 002060 000000      DCCWR:  .WORD  0          ;Number of writes that update cache
235                      ;
236 002062 000000      NUMDEV: .WORD  0          ;Byte index to last entry in device tables
237 002064 000000      FREIOQ: .WORD  0          ;Head of i/o queue element chain
238                      ;
239                      ; Define mux tables for DZ11's and DH11's.
240                      ;
241                      . MACRO  MXTBL  NAME
242                      . NLIST
243                      NAME      =      . -2
244                      . GLOBL  NAME
245                      . REPT   MAXMUX
246                      . WORD   0
247                      . ENDR
248                      . LIST
249                      . ENDM  MXTBL
250                      ;
251 002066              MXTBL  MXTYPE          ;DZ11 & DH11 type of mux (CDX#DZ or CDX#DH)
252 002070              MXTBL  MXCSR          ;DZ11 Control Status Register
253 002072              MXTBL  MXLPR          ;DZ11 Line Parameter Register
254 002074              MXTBL  MXTCR          ;DZ11 Transmit Control Register
255 002076              MXTBL  MXDTR          ;DZ11 Data Terminal Ready
256 002100              MXTBL  MXTBUF          ;DZ11 Transmitter Buffer Register
257 002102              MXTBL  MXSBRK          ;DZ11 Shadow register for hardware BRK reg.
258 002104              MXTBL  MXCAR          ;DZ11 Carrier Detect
259 002106              MXTBL  MXVEC          ;DZ11 & DH11 Vector address
260 002110              MXTBL  MXLNT          ;DZ11 & DH11 Addr of table to map mux # to Lin
261 002112              MXTBL  MH$BRK          ;DH11 Break control register
262 002114              MXTBL  MH$LPR          ;DH11 Line Parameter Register
263 002116              MXTBL  MH$PBR          ;DH11 Previous value of BAR register
264 002120              MXTBL  DM$CSR          ;DH11(DM11) Control Status Register
265 002122              MXTBL  DM$LSR          ;DH11(DM11) Line Status Register
266 002124              MXTBL  DM$VEC          ;DH11(DM11) Address of DM11 interrupt vector
267              002070'  MXRBUF  =      MXLPR          ;DZ11 Receiver Buffer Register
268              002076'  MXRING  =      MXTBUF          ;DZ11 Ring indicator flags
269              002102'  MXBRK   =      MXCAR          ;DZ11 Break control flags
270                      ; Equates for DH11 control registers
271              002066'  MH$SCR  =      MXCSR          ;DH11 System Control Register
272              002070'  MH$RCR  =      MXRBUF          ;DH11 Received Character Register
273              002072'  MH$CAR  =      MXTCR          ;DH11 Current Address Register
274              002074'  MH$BCR  =      MXDTR          ;DH11 Byte Count Register
275              002076'  MH$BAR  =      MXTBUF          ;DH11 Buffer Active Register
276              002102'  MH$SSR  =      MXCAR          ;DH11 Silo Status Register
277                      ; Equates for DHV11 control registers
278              002066'  VH$CSR  =      MH$SCR          ;DHV11 Control and Status Register
279              002070'  VH$DBR  =      MH$RCR          ;DHV11 Data Buffer Register
280              002112'  VH$LPR  =      MH$LPR          ;DHV11 Line Parameter Register
281              002120'  VH$LSR  =      DM$LSR          ;DHV11 Line Status Register
282              002116'  VH$LCR  =      DM$CSR          ;DHV11 Line Control Register

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283      002072'      VH$BA1 =      MH$CAR      ;DHV11 Buffer Address register 1
284      002102'      VH$BA2 =      MH$SSR      ;DHV11 Buffer Address register 2
285      002074'      VH$BCR =      MH$BCR      ;DHV11 Byte Count Register
286
287      ; Generate FORK request blocks.
288
289 002126 002132'    FREFRK: .WORD  FRKLST      ;Head of free list
290 002130 000000    FRKINI: .WORD  0          ;Pointer to fork blocks in init area
291 002132          FRKLST:
292          000004    .REPT  FRKGEN      ;Gen in a few static fork blocks
293          .WORD  .+22.          ;Link to next block in free list
294          .WORD  0,0,0,0,0,0,0,0,0,0
295          .ENDR
296 002262 000000 000000 000000    .WORD  0,0,0,0,0,0,0,0,0,0 ;Last block with 0 forward link
      002270 000000 000000 000000
      002276 000000 000000 000000
      002304 000000 000000
297
298      ; Symbolic equates for QBUS and UNIBUS machines.
299
300      000001    QBUS =      1
301      000000    UNIBUS =     0
302
303      ; Generate the memory size limit checking certain restrictions.
304      ; On non-extended machines, allow 256.Kb - 8.Kb I/O page
305      ; On extended machines, allow 4096.Kb - 256.Kb I/O page
306
307          .MACRO  MEMORY  SIZE
308          SIZMEM = SIZE
309          .IF    LE, SIZMEM
310              SIZMEM = 3840.
311          .ENDC
312          .IF    GT, SIZMEM-3840.
313              SIZMEM = 3840.
314          .ENDC
315          .IF    LT, <SIZMEM - 96.>
316      .ERROR ;Memory size limit too small for running TSX-Plus
317          .ENDC
318      ; Allocate the memory size to examine.
319          .WORD  SIZMEM*20
320          .ENDM  MEMORY
321
322      ; Memory management tables
323
324 002310    MAPSIZ: MEMORY  MEMSIZ      ;PAR value of physical memory cutoff
325 002312 000000    BASMAP: .WORD  0      ;Pointer to base of memory map table
326 002314 000000    LOMAP: .WORD  0      ;Pointer to 1st user page in MEMMAP
327 002316 000000    HIMAP: .WORD  0      ;Pointer above top user page in memmap
328 002320 000000    MAPPAR: .WORD  0      ;Value to map PAR 5 to mem allocation table
329 002322 000000    FREPGS: .WORD  0      ;# free pages
330 002324 000000    JCXPGS: .WORD  0      ;# pages needed for job context block
331 002326 000000    MXJMEM: .WORD  0      ;Max # K-bytes a job may use
332 002330 000000    DFJMEM: .WORD  0      ;Default # K-bytes a job may use
333 002332 000000    MXJADR: .WORD  0      ;Address above top of largest job space
334 002334 000000    SMRSIZ: .WORD  0      ;# 64-byte blocks allocated to system overlays
335 002336 000000    MHNSIZ: .WORD  0      ;# 64-byte blocks allocated for mapped handler
336 002340 000000    SRTSIZ: .WORD  0      ;# 64-byte blocks allocated for shared run-tim

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337 002342 000000      CSHSIZ: .WORD 0          ;# 64-byte blocks allocated for data cache
338                    ;
339                    ; Start a CSECT to hold shared run-time descriptor blocks
340                    ;
341 000000              .CSECT RDBSEC          ;CSECT for RDB entries
342 000000      RDBSEC:
343 000000      RDB:          ;Define base of RDB entries
344 002344              .CSECT TSGEN          ;Go back to standard TSGEN CSECT
345                    ;
346                    ; Symbolic equates for system editor names.
347                    ; Note these equates must match those in TSDEFS.
348                    ;
349                    000001      EDIT      =      1
350                    000002      TECO      =      2
351                    000003      KED       =      3
352                    000004      K52      =      4
353                    ;
354                    ; Symbolic equates for UCL order
355                    ;
356                    000001      FIRST     =      1
357                    000002      MIDDLE   =      2
358                    000003      LAST     =      3
359                    ;
360                    ; Symbolic names used to define line transmit/receive speeds.
361                    ;
362                    000000      S50       =      0          ; 50      baud
363                    000001      S75       =      1          ; 75      baud
364                    000002      S110      =      2          ; 110     baud
365                    000003      S134.5   =      3          ; 134.5  baud
366                    000004      S150      =      4          ; 150     baud
367                    000005      S300      =      5          ; 300     baud
368                    000006      S600      =      6          ; 600     baud
369                    000007      S1200     =      7          ; 1200    baud
370                    000010      S1800     =      10         ; 1800    baud
371                    000011      S2000     =      11         ; 2000    baud
372                    000012      S2400     =      12         ; 2400    baud
373                    000013      S3600     =      13         ; 3600    baud
374                    000014      S4800     =      14         ; 4800    baud
375                    000015      S7200     =      15         ; 7200    baud
376                    000016      S9600     =      16         ; 9600    baud
377                    000017      S19200    =      17         ; 19200   baud
378                    ;
379                    ; Symbolic names for parity codes
380                    ;
381                    040000      EVEN      =      040000      ;Even parity
382                    140000      ODD       =      140000      ;Odd parity
383                    000000      NONE      =      000000      ;No parity

```

```

1      ;-----
2      ; The following macro define the device handler tables.
3      ; There are two psects use in the device definition - one
4      ; allocates and defines the rad50 device name - the second
5      ; defines the handler attributes.
6      ;
7      .MACRO  DEVBEG          ;DEFINE THE DEVICE GLOBAL ENTRIES
8      .CSECT  DNAME          ;DEFINE THE DEVICE NAME PSECT
9      AUTHAN:                ;GLOBAL LABEL FOR DEVICE NAMES
10     .CSECT  DTYPE          ;DEFINE THE DEVICE TYPE PSECT
11     DTYPE:
12     .CSECT  TSGEN
13     .ENDM   DEVBEG
14
15     ;-----
16     ; The following flag definitions must match the TSDEFS definitions.
17     ;
18
19     000001   DMA           =      1      ;DX$DMA - This is a DMA device
20     000002   MAPIO        =      2      ;DX$MAP - 18-bit controller -- may require mapped I/O
21     000004   EVNBUF       =      4      ;DX$EBA - Buffer must be on even byte boundary
22     000010   NOCACHE     =     10      ;DX$NCA - Do not do caching for this device
23     000020   NOMOUNT     =     20      ;DX$NMT - Do not allow mounts for this device
24     000040   REQALC      =     40      ;DX$RAL - Require device to be allocated before use
25     000100   MAPH        =    100      ;DX$MPH - Map the handler for this device
26     000200   NOMAPH     =    200      ;DX$NHM - Do not map the handler for this device
27     000400   HANBUF     =    400      ;DX$IBH - Handler contains internal I/O buffer
28     001000   HNSPDO     =   1000      ;DX$NRD - Do .SPFUN to tell handler about dir ops
29     002000   NOSET      =   2000      ;DX$NST - Do not reload handler after SET
30
31     000000   NODMA       =      0      ;This is not a DMA device
32     000000   NONDMA     =     NODMA
33
34     ;-----
35     ; The DEVDEF macro defines the device name and allocates
36     ; table entries for the device name and the device attributes.
37     ;
38     000001   DVNUM = 1
39
40     .MACRO  DEVDEF  DEVNAM,DFLG1,DFLG2,DFLG3,DFLG4,DFLG5,DFLG6,DFLG7,DFLG8,DFLG9
41
42     DVNUM = DVNUM + 1          ;Increment the device number
43     DVFLG =      0            ;Get device flags in DVFLG
44
45     .IF      LT, <MAXDEV-2 - DVNUM> ;Check the maximum devices allowed
46     .ERROR  1;More devices defined than MAXDEV
47     .MEXIT
48     .ENDC
49
50     ; Accumulate flags for the device definition
51
52     .IF      NB DFLG1          ;Check if argument exists
53     DVFLG = DVFLG!DFLG1      ;Include in device attributes
54     .ENDC ;NB DFLG1
55
56     .IF      NB DFLG2          ;Check if argument exists
57     DVFLG = DVFLG!DFLG2      ;Include in device attributes

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58             . ENDC ;NB DFLG2
59
60             . IF      NB DFLG3           ; Check if argument exists
61 DVFLG = DVFLG!DFLG3           ; Include in device attributes
62             . ENDC ;NB DFLG3
63
64             . IF      NB DFLG4           ; Check if argument exists
65 DVFLG = DVFLG!DFLG4           ; Include in device attributes
66             . ENDC ;NB DFLG4
67
68             . IF      NB DFLG5           ; Check if argument exists
69 DVFLG = DVFLG!DFLG5           ; Include in device attributes
70             . ENDC ;NB DFLG5
71
72             . IF      NB DFLG6           ; Check if argument exists
73 DVFLG = DVFLG!DFLG6           ; Include in device attributes
74             . ENDC ;NB DFLG6
75
76             . IF      NB DFLG7           ; Check if argument exists
77 DVFLG = DVFLG!DFLG7           ; Include in device attributes
78             . ENDC ;NB DFLG7
79
80             . IF      NB DFLG8           ; Check if argument exists
81 DVFLG = DVFLG!DFLG8           ; Include in device attributes
82             . ENDC ;NB DFLG8
83
84             . IF      NB DFLG9           ; Check if argument exists
85 DVFLG = DVFLG!DFLG9           ; Include in device attributes
86             . ENDC ;NB DFLG9
87
88 ; Enter the device name into the table defining handlers to load on startup
89
90             . CSECT  DNAME
91             X = .
92             . RAD50  /'DEVNAM'/           ; Include the device name in the PSECT
93             . IF      NE, <.-X-2>
94 .ERROR 2; Incorrect device name specified
95             . MEXIT
96             . ENDC
97
98 ; Enter the device specification flag into handler flags table
99
100            . CSECT  DTYPE
101            . WORD   DVFLG                 ; Include the device type in the PSECT
102            . CSECT  TSGEN
103
104            . ENDM   DEVDEF
105
106            ;-----
107 ; The DEVEND macro allocates the remainder of the table entries.
108 ;
109            . MACRO  DEVEND
110 L          = <MAXDEV-2-DVNUM>
111            . IF    GT, L
112            . REPT  L
113            DEVDEF <$$ >
114            . ENDR

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

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;-----
; 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

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58          .ENDR
59          .LIST
60          .ENDM   QBT
61
62          ;-----
63          ; The TBLDEF macro is called once to define table
64          ; space needed by all of the lines.
65          ; It has four arguments:
66          ; Argument 1 is the number of primary (real) lines.
67          ; Argument 2 is the number of subprocesses.
68          ; Argument 3 is the number of detached lines.
69          ; Argument 4 is the number of dedicated CL lines.
70          ;
71          .MACRO TBLDEF ANPL,ANSL,ANDL,ANIOL
72          .NLIST MD
73          NPL = ANPL ;# of primary lines
74          NSL = ANSL ;Number of subprocesses
75          NDL = ANDL ;Number of detached lines
76          NIOI = ANIOL ;Number of dedicated CL lines
77          NLINES = NPL+NSL+NDL ;Total number of jobs
78          ;
79          ; Make sure the total number of CL units does not exceed 16
80          ;
81          .IF GT <NIOI-16.>
82          .ERROR ;You cannot have more than 16 CL units
83          NIOI = 16. ;Reduce number to 16.
84          .ENDC
85          .IF GT <<NIOI+CLXTRA>-16.>
86          .ERROR ;You cannot have more than 16 CL units
87          CLXTRA = 16.-NIOI ;Reduce extra units if total > 16
88          .ENDC
89          CLTOTL = NIOI+CLXTRA
90          ;
91          ; Set up number of lines variables.
92          ; The lines are numbered in the following order:
93          ; Primary lines.
94          ; Detached job lines.
95          ; Subprocesses.
96          ; Dedicated CL lines.
97          ;
98          LSTPL = 2*NPL ;Last primary line index
99          FSTDJ = LSTPL+2 ;First detached line
100         LSTDJ = LSTPL+<2*NDL> ;Last detached line
101         FSTSL = LSTDJ+2 ;Index to first subprocess
102         NLIN2 = 2*NLINES ;Index to last time-sharing line
103         LSTSL = NLIN2 ;Index to last subprocess
104         FSTIOL = LSTSL+2 ;Index to first CL line
105         LSTIOL = FSTIOL+<2*<NIOI-1>> ;Index to last CL line
106         LSTLIN = 2*<NPL+NSL+NDL+NIOI> ;Index number of last line
107         .IF EQ,NIOI ;If there are no CL lines
108         TNHL = NPL ;Total number of lines with hardware-ctrl tbls
109         .IFF ;If there are CL lines
110         TNHL = NPL+NSL+NDL+NIOI ;Total number of lines with hardware-ctrl tbls
111         .ENDC
112         LSTHL = TNHL*2 ;Index # of last hardware line
113         ;
114         ; Define number of slots in job swap file if SWPSLT=0

```

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115 ;
116 . IF EQ, SWPSLT
117 SWPSLT = NLINES ; Default to one slot for each job
118 . ENDC ; EQ, SWPSLT
119 . IF GT, <SWPSLT-NLINES> ; Never need more slots than lines
120 SWPSLT = NLINES
121 . ENDC ; GT, <SWPSLT-NLINES>
122 . IF EQ, SWAPFL ; If this is a non-swapping system
123 SWPSLT = 0 ; No swap slots needed
124 . ENDC ; EQ, SWAPFL
125 ;
126 ; Define line tables.
127 ;
128 OB LQLINK ; Link for execution queues
129 OB LSTATE ; Current execution state
130 OB LBSPRI ; Job base priority value (byte)
131 LPRI = LBSPRI+1 ; Current job priority (byte)
132 OB LPARNT ; Index number of parent job
133 OBT LSW ; Line status word
134 OB LSW2 ; Additional line status
135 OB LSW2S ; Copy of LSW2 used for reset on prog exit
136 OBH ILSW2 ; Initial values for LSW2
137 OBT LSW3 ; Additional line status flags
138 OB LSW4 ; Additional line status flags
139 OBT LSW5 ; More line status flags
140 OBT LSW6 ; Line status table # 6
141 OB LSW7 ; Line status table # 7
142 OB LSW8 ; Line status table # 8
143 OB LSW9 ; Line status table # 9
144 OBT LSW10 ; Line status table # 10
145 OB LSW11 ; Line status table # 11
146 OBT LCLUNT ; CL unit index number if connected as CL line
147 OBP ITRMTP ; Initial terminal type code
148 OBT LTRMTP ; Current terminal type code
149 OBH LNAME ; Descriptive name for line
150 OB LMEMIN ; # pages of memory needed to inswap job
151 OB LPARBS ; PAR base address for job
152 OB LCXPAR ; Value for KPAR6 to map to job context block
153 OB LNBLKS ; # pages of memory currently assigned to job
154 OB LNSBLK ; # pages of memory used by PLAS regions
155 OB LTPAR ; Physical memory PAR value for terminal buffer
156 OB LQUAN ; Job's execution quantum
157 OB LITIME ; Time job is held in "interactive" state
158 OB LIOHLD ; Hold time for I/O starts while starting swap
159 OB LMINQ ; Minimum core-residency time
160 OB LHIPCT ; Controls # high-prio quantum periods job gets
161 OB LIOCNT ; # active i/o operations for job
162 OB LBASE ; Base page # assigned to job
163 OBH LHIRBB ; Start of silo input ring buffer
164 OBH LHIRBE ; End of silo input ring buffer
165 OBH LHIRBA ; Allocated size of silo input ring buf
166 OBH LHIRBS ; Free space in silo input ring buffer
167 OBH LHIRBP ; Pointer where to store next char in buffer
168 OBH LHIRBG ; Pointer where to get next char from buffer
169 OBH LHIRBC ; Autoflow control stop/start char count limits
170 OBT LINSIZ ; Size of input character buffer
171 OB LINBUF ; Start of input buffer

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172	OB	LINEND	;End of input buffer
173	OB	LINNXT	;Where next input char goes
174	OB	LINPNT	;Where to get next char read
175	OB	LINCNT	;# of chars in input buffer
176	OB	LINSPC	;# free bytes in input buffer
177	OB	LACTIV	;# of activation chars pending
178	OB	LAFSIZ	;Field width for activation condition
179	OB	LFWLIM	;Field width limit
180	OB	LSTACT	;Position of last activation char
181	OB	LINCUR	;Pos of cursor at start of line
182	OB	LOTSIZ	;Size of output buffer
183	OB	LOTBUF	;Start of output buffer
184	OB	LOTEND	;End of output buffer
185	OB	LOTNXT	;Place to put next output char
186	OB	LOTPNT	;Place to get next output char
187	OB	LOTSPC	;Space left in output buffer
188	OB	LWINDO	;Pointer to current display window block
189	OBH	LCDTYP	;Type of communications device (CDX\$xxx)
190	OBH	LINIR	;Terminal input service routine
191	OBH	LOUTIR	;Terminal output service routine
192	OBH	INVEC	;Input interrupt vector loc
193	OBH	RSR	;Receiver status register address
194	OBH	RBR	;Receiver buffer register
195	OBH	TSR	;Transmitter status register
196	OBH	TBR	;Transmitter buffer register
197	OBH	LDHB1B	;Base of DMA buffer 1
198	OBH	LDHB1P	;Pointer into DMA buffer 1
199	OBH	LDHB2B	;Base of DMA buffer 2
200	OBH	LDHB2R	;Remaining byte count for buffer 2
201	OBH	LDHB2S	;Suspended pointer for buffer 2
202	OBH	LCXTBL	;Pointer to character translation table
203	OBP	LSECPT	;Pointer to secondary line # table
204	OBP	LXCL	;CL unit to which line is cross connected
205	OB	LCMPL	;Head of chain of completion requests for job
206	OB	LCMQHD	;Queue head for completed message requests
207	OB	LMOHND	;Queue head for job monitor blocks
208	OB	LSUCF	;Start-up command file
209	OB	LSWPBK	;Block # in swap file
210	OB	LJSW	;User's JSW
211	OB	LEMTPC	;PC of last user-mode emt
212	OB	LSCCA	;SCCA control word address
213	OB	LSPND	;SPND counter for job
214	OB	LBRKCG	;Break character completion queue entry
215	OB	LTTCR	;Completion routine for TT input activation
216	OB	LBRKCH	;Break character for line
217	OB	LCOL	;Current column position
218	OBP	LMSGBF	;Send message pointer
219	OB	LSNDCH	;Last char sent
220	OB	LESRTN	;Echo suppression routine
221	OB	LESCHR	;Echo suppression char code
222	OB	LRBFIL	;Rubout filler for line
223	OB	LTSCMD	;Pending special action command
224	OB	LNSPAC	;# of special activation chars
225	OB	LSPACT	;Point to special actv char tbl
226	OB	LPROJ	;Project #
227	OB	LPROG	;Programmer #
228	OB	LCPUHI	;High-order CPU time

229		OB	LCPULD	;Low-order CPU time
230		OB	LCONTM	;Connect time
231		OBP	LCDTIM	;Lost-carrier disconnect time
232		OBP	LOFFTM	;Allowed logoff time before DTR drop for line
233		OBP	LABTIM	;Autobaud control timer
234		OB	LRDTIM	;TT read timeout
235		OB	LRTCHR	;TT read timeout activation character
236		OB	LSLEPL	;.WAIT sleep time for job (low-order)
237		OB	LSLEPH	;.WAIT sleep time for job (high-order)
238		OBH	LMXNUM	;Index # of mux controlling line
239		OBH	LMXPRM	;Line parameters (speed, parity, stop bits)
240		OB	LPRG1	;1st 3 chars of running program name (rad50)
241		OB	LPRG2	;2nd 3 chars of running program name (rad50)
242	LUNAME	=	.-12.	;Offset user name table by size of 1 entry
243		.BLKB	NLINES*12.	;Store 12 char user name here
244	LMXLN	=	RBR	;# of this line within mux group

```

1      ;
2      ; Define subprocess mapping tables
3      ;
4      LNMAP      =      .-2
5                  .NLIST  BIN
6      I          =      0
7                  .REPT   NPL
8      I          =      I+2
9                  .WORD   I
10                 .ENDR
11     ; Define LNPRIM table
12     LNPRIM     =      .-2
13     I          =      0
14                 .REPT   NPL+NDL
15     I          =      I+2
16                 .WORD   I
17                 .ENDR
18                 .IF     NE,NSL
19                 .REPT   NSL
20     I          =      I+2      ;Keep count for NIOL if any
21                 .WORD   0
22                 .ENDR
23                 .ENDC
24                 .IF     NE,NIOL
25                 .REPT   NIOL
26     I          =      I+2
27                 .WORD   I
28                 .ENDR
29                 .ENDC
30                 .LIST   BIN
31     ;
32     ; Generate interrupt receivers
33     ;
34     ; Input interrupt vector
35         .NLIST  BIN
36         .REPT   TNHL
37         INCB   LINNUM      ;COUNT UP WHICH LINE INTERRUPTED
38         .ENDR
39     INRECV:  JMP   ININT      ;ENTER INTERRUPT SERVICE ROUTINE
40     ; Output interrupt vector
41     LXX      =      2
42     OTRECV:
43         .REPT   TNHL
44         JSR    R4,@#DLINT
45         .WORD   LXX
46     LXX      =      LXX+2
47         .ENDR
48         .LIST   BIN
49         .LIST   MD
50         .ENDM   TBLDEF

```

```

1      ;-----
2      ; The CLDEF macro begins a line definition block for a serial communications
3      ; line that will be used as a dedicated CL line.
4      ; The CLDEF macro is similar to a LINDEF and can occur inside or outside
5      ; of a MUXDEF block.
6      ; The form of the CLDEF macro outside a MUXDEF block is:
7      ;   CLDEF   line_number,vector_address,RSR_address
8      ; The form of the CLDEF macro inside a MUXDEF block is:
9      ;   CLDEF   line_number,mux_line_number
10     ;
11     ;   .MACRO   CLDEF   AIOLN,ARG1,ARG2
12     ;
13     ; Check to make sure the CL unit number is valid
14     ;
15     IOLN   =       AIOLN
16     .IF    GE <IOLN-CLTOTL>
17     .ERROR ;0 CL unit number exceeds # declared CL units
18     IOLN   =       0
19     .ENDC
20     ;
21     ; See if this CL unit has already been assigned to another line
22     ;
23     .IF    NDF     CLUD'AIOLN
24     CLUD'AIOLN =     1
25     .ENDC
26     .IF    GT <CLUD'AIOLN-2>
27     .ERROR ;CL unit AIOLN used more than once
28     .ENDC
29     CLUD'AIOLN =     CLUD'AIOLN+1
30     ;
31     ; Set flag saying we are doing an CLDEF definition and then invoke LINDEF.
32     ; Note, the LINEND macro will reset IOLFLG.
33     ;
34     IOLFLG =     1           ;We are inside CLDEF
35     LINDEF ARG1 ARG2
36     .ENDM   CLDEF
37     ;
38     ;-----
39     ; The LINDEF macro begins a line definition block.
40     ; A line definition block is required for each primary
41     ; (real) line. A line definition block begins with
42     ; a LINDEF macro call, may include other macro calls
43     ; such as LFLAGS and must end with a LINEND macro call.
44     ; there are two arguments to the LINDEF macro:
45     ; Arg 1 is the input interrupt vector address or mux line #.
46     ; Arg 2 is the address of the receiver status register.
47     ; Arg 3 is 'OPERATOR' to specify line is control terminal.
48     ;
49     000000 LN      =     0           ;Current line number
50     000000 BO      =     0           ;1 if inside LINDEF block
51     000000 LX      =     0           ;Line index number
52     000000 IOLFLG =     0           ;1 if inside an CLDEF block
53     000000 IOLN   =     0           ;Number of dedicated CL line
54     000000 NPLDF  =     0           ;Number of declared primary T/S lines
55     000000 NCLDF  =     0           ;Number of CL lines that have been defined
56     000000 NDLDF  =     0           ;Number of declared detached jobs
57     ;

```

```

58          .MACRO  LINDEF  AINTAD, ARSR, AOPR
59          .IF      NE BO          ;SEE IF LAST BLOCK LEFT OPEN
60          .ERROR  1; Missing LINEND on last line
61          LINEND          ;CLOSE OFF PREVIOUS BLOCK
62          .ENDC
63          BO      =      1          ;SAY WE'RE INSIDE A BLOCK
64          NAMDON  = 0          ;SAY NO NAME DECLARED YET
65          CMFDON  = 0          ;SAY NO SUCF DECLARED YET
66          ;
67          ; Update current line #
68          ; and make sure we don't overflow tables
69          ;
70          .IF      EQ, IOLFLG      ;If not inside an CLDEF block
71          LN      =      LN+1      ;Line counter
72          NPLDF   =      NPLDF+1   ;Count number of primary lines
73          LX      =      LX+2      ;Line index
74          CLX     =      LX
75          .IF      GT <LN-NPL>
76          .ERROR  2; More lines than declared with TBLDEF
77          .MEXIT
78          .ENDC      ;GT <LN-NPL>
79          .IFF      ;EQ, IOLFLG      ;If inside an CLDEF block
80          CLX     =      FSTIOL+<2*NCLDF>;Get line index # of this line
81          NCLDF   =      NCLDF+1   ;Count # of dedicated CL lines
82          .IF      GT <NCLDF-NIOL> ;Don't exceed # CL lines declared in TBLDEF
83          .ERROR  0; More CL lines than declared in TBLDEF
84          .MEXIT
85          .ENDC      ;GT <NCLDF-NIOL>
86          S      =
87          .      =      LCLUNT+CLX    ;Store CL unit # into table for this line
88          .WORD   2*IOLN
89          .      =      S
90          .ENDC
91          ;
92          ; *** Do this for DL11 lines only ***
93          ;
94          .IF      EQ CURMX        ;True if not within mux definition block
95          CURMXL  =      0
96          ;
97          ; Set up interrupt vector addresses
98          ;
99          .IF      B AINTAD
100         .IF      EQ, IOLFLG
101         .ERROR  3; Missing interrupt address (arg 1)
102         .IFF
103         .ERROR  3; Missing interrupt address (arg 2)
104         .ENDC
105         .MEXIT
106         .ENDC
107         VECCHK  AINTAD, 7
108         S      =
109         .      =      INVEC+CLX
110         .WORD   AINTAD
111         .      =      S
112         ;
113         ; Set up DL11 register addresses
114         ;

```

```

115         .IF      B ARSR
116         .IF      EQ,IOLFLG
117         .ERROR 4 ; Missing receiver register address (arg 2)
118         .IFF
119         .ERROR 4; Missing receiver register address (arg 3)
120         .ENDC
121         .MEXIT
122         .ENDC
123         SRCHK    ARSR
124     S         =
125         =        RSR+CLX
126         .WORD   ARSR
127         =        RBR+CLX
128         .WORD   ARSR+2
129         =        TSR+CLX
130         .WORD   ARSR+4
131         =        TBR+CLX
132         .WORD   ARSR+6
133         .IF      NB ADPR           ;SEE IF THIS IS CONTROL TERMINAL
134         =        CTRLTT           ;REMBER CONTROL TERMINAL #
135         .WORD   CLX
136         .ENDC
137         =        S
138     ;
139     ;   *** Do this for DZ11 and DH11 lines only ***
140     ;
141         .IFF
142     S         =
143         =        LMXNUM+CLX       ;MUX UNIT NUMBER
144         .WORD   CURMX
145         .IF      B AINTAD
146         .ERROR 0;Missing multiplexer line number
147     CURMXL   =        0
148         .IFF
149     CURMXL   =        AINTAD
150         .ENDC
151         =        LMXLN+CLX       ;LINE WITHIN MUX
152         .WORD   CURMXL
153         .IF      NB ARSR
154         =        CTRLTT
155         .WORD   CLX
156         .ENDC
157         =        S
158         .ENDC
159     ;
160     ;   *** Do this for all lines ***
161     ;
162     S         =
163         =        LCDTYP+CLX       ;Communications device type index
164         .WORD   CURCDX
165         =        S
166     ;
167     ;   Establish default values in case user doesn't specify
168     ;   them inside line definition block.
169     ;
170     DFLAGS   =        NRMFLG       ;DEFAULT LINE CONTROL FLAGS
171         .IF      EQ,IOLFLG       ;If this is not an CLDEF

```

```
172      DIS      =      DINSPC      ; INPUT BUFFER SIZE
173      DOS      =      DOTSPC      ; OUTPUT BUFFER SIZE
174      . IFF
175      DIS      =      0            ; Input ring buffer size
176      DOS      =      CLORSZ      ; Output ring buffer size
177      . IIF LE,DOS DOS = 32.      ; Don't allow <= 0 size
178      . ENDC
179
180      ; Establish default values for character silos
181      ;
182      SILSIZ = 0
183      SILXOF = 0
184      SILXON = 0
185      ;
186      . ENDM LINDEF
```

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```

;-----
; 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.

```

```

      .CSECT  NAMSEC
NAMSEC:
      .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

```

```

58      ; terminal input character silo.
59      ; Arg 1 = Size of the silo buffer.
60      ; Arg 2 = Free space remaining when XOFF is to be sent.
61      ; Arg 3 = Number of chars remaining when XON is to be sent.
62      ;
63      .MACRO  SILO      ASIZ,AXOF,AXON
64      SILSIZ =          ASIZ
65      SILXOF =          AXOF
66      SILXON =          AXON
67      .ENDM   SILO
68      ;
69      ;-----
70      ; The PAGE macro is used to establish the number
71      ; of lines on a page.
72      ;
73      .MACRO  PAGE ALINES
74      .ENDM   PAGE
75      ;
76      ;-----
77      ; The CMDFIL macro is used to declare a command file which
78      ; is to be executed when the line is started.
79      ;
80      .CSECT  CMFSEC
81      CMFSEC:
82      .CSECT  TSGEN
83      .MACRO  CMDFIL  ARG
84      .IF    EQ,IOLFL0      ;Only do for non-CL lines
85      .CSECT  CMFSEC
86      NAMPTR = .
87      .ASCIZ  /ARG/
88      CMFTOP = .
89      .CSECT  TSGEN
90      S      = .
91      .      =          LSUCF+CLX
92      .WORD  NAMPTR
93      .      =          S
94      .ENDC
95      CMFDON = 1
96      .ENDM   CMDFIL
97      ;
98      ;-----
99      ; The LINPRM macro is used to specify parameters
100     ; for lines.
101     ; There are three parameters:
102     ; 1. Speed select code.
103     ; 2. Even (0) / Odd (1) parity (No longer used).
104     ; 3. One (0) or two (1) stop bits
105     ;
106     .MACRO  LINPRM  ASPD,APAR,ASTOP
107     PERR   =          0
108     .IIF   GT,ASPD-17      PERR=1
109     .IIF   GT,APAR-2      PERR=1
110     .IIF   LT,ASTOP-1     PERR=1
111     .IIF   GT,ASTOP-2     PERR=1
112     .IF    NE,PERR
113     .ERROR ;Invalid speed, parity or stop-bits parameter in LINPRM
114     .ENDC

```

```

115      XPAR      =      100
116      CARLEN    =      20
117      .IF      GT,<APAR-1>
118      XPAR      =      0
119      CARLEN    =      30
120      .ENDC
121      LSTPRM    =      <ASPD*400>
122      .ENDM    LINPRM
123      ;
124      ;-----
125      ; The SPEED macro is used to specify baud rates for lines
126      ; as well as number of data bits and parity selection.
127      ; The default is 9600 baud with 8. data bits and no parity.
128      ; The form of the macro is:
129      ;
130      ;      SPEED      speedcode, data_bits, parity
131      ;
132      ; where      speedcode is selected from the speed code table
133      ;              and is of the form S9600, for example
134      ; and      data_bits = 7 or 8.
135      ; and      parity = EVEN, ODD or NONE
136      ;
137      007000    LSTPRM = <S9600*400>!<20000*0>!NONE      ; Default to 4800,8,N
138      ;
139      .MACRO    SPEED      SPDCOD, NBITS, PARCOD
140      .IF      DF, S'SPDCOD
141      SPDVAL   =      S'SPDCOD
142      .IFF      ; DF, S'SPDCOD
143      .IF      DF, SPDCOD
144      SPDVAL   =      SPDCOD
145      .IFF      ; DF, SPDCOD
146      .ERROR   0; Invalid speed specified with SPEED macro
147      SPDVAL   =      14.
148      .ENDC      ; NDF, S'SPDCOD
149      .ENDC      ; DF, S'SPDCOD
150      .IF      B, NBITS
151      NDBITS   =      8.
152      .IFF      ; B, NBITS
153      NDBITS   =      NBITS
154      .IF      LT, <NDBITS-7>
155      .ERROR   ; SPEED macro only accepts 7 or 8. data bits
156      NDBITS   =      8.
157      .ENDC      ; LT, <NDBITS-7>
158      .IF      GT, <NDBITS-8. >
159      .ERROR   ; SPEED macro only accepts 7 or 8. data bits
160      NDBITS   =      8.
161      .ENDC      ; GT, <NDBITS-8. >
162      .ENDC      ; B, NBITS
163      .IF      B, PARCOD
164      PARITY   =      NONE
165      .IFF      ; B, PARCOD
166      PARITY   =      PARCOD
167      .IF      NE, PARITY      ; NOT NONE?
168      .IF      NE, <PARITY-EVEN> ; NOT EVEN?
169      .IF      NE, <PARITY-ODD> ; NOR ODD?
170      .ERROR   ; Parity must be EVEN, ODD or NONE in SPEED macro
171      PARITY   =      NONE

```

```

172             . ENDC      ; NOT ODD
173             . ENDC      ; NOT EVEN
174             . ENDC      ; EVEN OR ODD
175             . ENDC      ; B, PARCOD
176 LSTPRM      =          <SPDVAL*400>!<20000*<B.-NDBITS>>!PARITY
177             . ENDM      SPEED
178
179 ;-----
180 ; The VECCHK macro is called to see if a line vector
181 ; address is reasonble.
182 ;
183             . MACRO     VECCHK  VA, MASK
184 VERR=0
185 . IIF      LT, VA-60          VERR=1
186 ; Although RT-11 V5.3 reserves 470 and 474, we do not (for now).
187 . IIF      GE, VA-500        VERR=1
188 . IIF      NE, VA&MASK       VERR=1
189             . IF        NE, VERR
190 . ERROR    ; Invalid vector address for this line
191             . ENDC
192             . ENDM      VECCHK
193
194 ;-----
195 ; SRCHK macro checks the validity of a receiver status
196 ; register address
197 ;
198             . MACRO     SRCHK   SR
199 SRERR=0
200 . IIF      LT, SR-160000      SRERR=1
201 . IIF      NE, SR&7          SRERR=1
202             . IF        NE, SRERR
203 . ERROR    ; Invalid status register address for this line
204             . ENDC
205             . ENDM      SRCHK

```

```

1      ; -----
2      ; The LINEND macro is used to close out a line
3      ; definition block.
4      ;
5      .CSECT  SASECT
6      SASECT:
7      .CSECT  TSGEN
8      .MACRO  LINEND
9      ; Make sure we're inside a line def block.
10     .IF     EQ BO
11     .ERROR  6 ; Missing LINDEF for this line
12     BO     =      0
13     .MEXIT
14     .ENDC
15     BO     =      0          ;END LINDEF BLOCK
16     ;
17     ; Make sure NAME and CMDFIL reserve at least 1 byte
18     .IF     EQ,NAMDON
19     NAME    <>
20     .ENDC
21     .IF     EQ,CMFDON
22     CMDFIL  <>
23     .ENDC
24     ;
25     ; Define input and output character buffer sizes for line
26     ; Define input buffer
27     S      =      .
28     .      =      LINSIZ+CLX
29     .WORD  DIS-1          ;DEFINE BUFFER SIZE
30     .      =      S
31     ; Define output buffer
32     S      =      .
33     .      =      LOTSIZ+CLX
34     .WORD  DOS           ;DEFINE BUFFER SIZE
35     .      =      S
36     ;
37     ; Define table for user defined activation characters.
38     ;
39     .IF     EQ,IOLFLG    ;Only do for non-CL lines
40     S      =      .
41     .CSECT  SASECT
42     T      =      .
43     .BLKB  MXSPAC
44     .CSECT  TSGEN
45     .      =      LSPACT+CLX
46     .WORD  T
47     .      =      S
48     .ENDC          ;End conditional (EQ,IOLFLG)
49     ;
50     ; Items for primary lines only.
51     ;
52     LF     =      0          ;Assume this is not a primary or CL line
53     .IF     NE,IOLFLG    ;If doing a CL line definition
54     LF     =      1          ;Treat like primary line
55     .IFF
56     .IF     LE <LN-NPL> ;Do only if this is a primary line
57     LF     =      1          ;Gen code

```

```

58          . ENDC          ;End conditional (LE <LN-NPL>)
59          . ENDC          ;End conditional (NE, IOLFLG)
60          ;
61          . IF      NE, LF      ;Do if primary line or CL line
62          ;
63          ; Define line control flags
64          ;
65          S          =          .
66          .          =          ILSW2+CLX
67          . WORD    DFLAGS      ;SET THE FLAGS
68          .          =          S
69          ;
70          ; Defile silo buffer size information
71          ;
72          S          =          .
73          .          =          LHIRBA+CLX      ;Silo size
74          . WORD    SILSIZ
75          .          =          LHIRBC+CLX      ;XOFF/XON control info
76          . BYTE    SILXOF      ;XOFF point
77          . BYTE    SILXON      ;XON point
78          .          =          S
79          ;
80          ; Define line parameters (Required for DZ11 & DH11 lines, optional for DL11)
81          ;
82          . IF      NDF, LSTPRM
83          LSTPRM =          0
84          . IF      NE CURMX
85          . ERROR  0;Missing SPEED macro call
86          . ENDC          ;End conditional (NE CURMX)
87          . ENDC          ;End conditional (NDF, LSTPRM)
88          S          =          .
89          .          =          LMXPRM+CLX
90          . WORD    <LSTPRM>!<CURMXL>
91          .          =          S
92          ;
93          ; Define subprocess table.
94          ;
95          . IF      EQ, IOLFLG      ;Do if not inside CLDEF block
96          . IF      NE MAXSEC
97          S          =          .
98          .          =          LSECPT+CLX
99          . WORD    S
100         .          =          S
101         . REPT    MAXSEC
102         . BYTE    0
103         . ENDR
104         . EVEN
105         . ENDC          ;End conditional (NE MAXSEC)
106         . ENDC          ;End conditional (EQ, IOLFLG)
107         ;
108         ; Define chracter translation table
109         ;
110         . IF      NE MXTTCT
111         S          =          .
112         .          =          LCXTBL+CLX
113         . WORD    S
114         .          =          S

```

```

115             .REPT  MXTTCT+1
116             .WORD  0
117             .ENDR
118             .EVEN
119             .ENDC           ;End conditional (NE MXTTCT)
120
121             .ENDC           ;End conditional (NE,LF)
122
123             ; Reset flag that says we are inside an CLDEF block
124
125             IDLFLG =      0           ;No longer inside an CLDEF block
126             .ENDM  LINEND
127
128             ;-----
129             ; The CLEND macro is like the LINEND macro except it is used to
130             ; terminate a communication line definition started with a CLDEF macro.
131
132             .MACRO  CLEND
133             LINEND
134             .ENDM  CLEND
135
136             ;-----
137             ; The DETACH macro is used to define a start-up command file
138             ; To be run on a detached line when TSX-Plus is started.
139             ; The one argument to DETACH is the name of the command file.
140
141             .MACRO  DETACH  NAME
142             .IF     NE      BO
143             .ERROR  1: Missing LINEND on last line
144             LINEND
145             .ENDC
146             NDLDLDF =      NDLDLDF+1           ;Count number of detached jobs
147             LN      =      LN+1
148             LX      =      LX+2
149             CLX     =      LX
150             .IF     LE, <NDL>
151             .ERROR  2: DETACH macro declared with no detached lines
152             .MEXIT
153             .ENDC
154             .IF     GT, <LN-NPL-NDL>
155             .ERROR  2: More lines than declared with TBLDEF
156             .MEXIT
157             .ENDC
158             ; Store startup command file name
159             S      =
160             =      LSUCF+CLX
161             .WORD  S
162             =      S
163             .IF     NB, <NAME>
164             .ASCIZ /NAME/
165             .ENDC
166             .REPT  <DETCBS+1-<. -S>>
167             .BYTE  0
168             .ENDR
169             .EVEN
170             .ENDM  DETACH
171

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```

172 ; -----
173 ; The SYSPS macro is used to define a system password which may be
174 ; required to be entered for some lines before the normal logon
175 ; sequence begins.
176 ;
177 000000          SYSPSS = 0
178                .MACRO SYSPS  STRING
179                SYSPSS = 1
180 SYPSWD: .ASCIZ  \STRING\
181                .IF      GT, <21. -<. -SYPSWD>>
182                .REPT   <21. -<. -SYPSWD>>
183                .BYTE   0
184                .ENDR
185                .ENDC   ; GT, <21. -<. -SYPSWD>>
186                .EVEN
187                .ENDM   SYSPS
188 ;
189 ; -----
190 ; The RTDEF macro is used to declare information about shared
191 ; run-time systems.
192 ;
193 ; The 3 arguments to RTDEF are
194 ; 1. 12 character name of run-time system file.
195 ; 2. R or RW indicating Read-only or Read-Write access.
196 ; 3. Number of blocks to skip at the front of the file.
197 ;
198                .MACRO RTDEF  NAME, RFLAG, SKIP
199                .CSECT RDBSEC
200 T =
201                .RAD50  /'NAME'/
202                .IF      NE, <<. -T>-R. >
203 .ERROR 0; Run-time system name was not correctly specified
204                .ENDC
205                .WORD   0, 0
206                .IF      IDN, RFLAG, RW
207                .BYTE   RF#WRT
208                .IFF
209                .BYTE   0
210                .ENDC
211                .BYTE   SKIP
212                .CSECT  TSGEN
213 NUMRDB = NUMRDB+1
214                .ENDM   RTDEF

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;-----
; 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

```

58
59

= S
. ENDM DHDEF

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;-----
; 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
59

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

```

1
2
3 ; -----
4 ; The MUXDEF macro is used to declare the beginning
5 ; of a block of lines which are attached to a DZ11
6 ; multiplexer. All line definition blocks up to
7 ; the next MUXEND macro call will be connected to
8 ; the DZ11.
9 ; There are two arguments to MUXDEF:
10 ; 1. The interrupt vector address of the mux receiver.
11 ; 2. The address of the mux control and status register.
12 ;
13 ; .MACRO MUXDEF AVEC,ACSR
14 ; .IF NE CURMX
15 .ERROR 1; Missing MUXEND macro
16 MUXEND
17 .ENDC
18 LSTMX = LSTMX+2
19 CURMX = LSTMX
20 CURCDX = CDX#DZ ;Lines within this block are connected to DZ11
21 VECCHK AVEC,7
22 SRCHK ACSR
23 S =
24 = MXTYPE+CURMX ;Multiplexor type
25 .WORD CDX#DZ ;Type = DZ11
26 = MXCSR+CURMX
27 .WORD ACSR
28 = MXLPR+CURMX
29 .WORD ACSR+2
30 = MXTCR+CURMX
31 .WORD ACSR+4
32 = MXDTR+CURMX
33 .WORD ACSR+5
34 = MXTBUF+CURMX
35 .WORD ACSR+6
36 = MXCAR+CURMX
37 .WORD ACSR+7
38 = MXVEC+CURMX
39 .WORD AVEC
40 = S
41 .ENDM MUXDEF
42 ;
43 ; Alternate name for MUXDEF macro
44 ;
45 ; .MACRO DZDEF AVEC,ACSR
46 MUXDEF AVEC,ACSR
47 .ENDM DZDEF
48 ; -----
49 ; The MUXEND macro is called to declare the end of
50 ; a set of lines connected to a DZ11 or DH11.
51 ;
52 ; .MACRO MUXEND
53 ; .IF EQ CURMX
54 .ERROR 6; Missing earlier MUXDEF
55 .ENDC
56 CURMX = 0
57 CURCDX = CDX#DL ;Following lines are connected to DL11's

```

58

.ENDM MUXEND

```

1
2 ; -----
3 ; The SPOOL macro is used to declare those devices which
4 ; are to be spooled by TSX-Plus (such as line printers).
5 ; There are seven arguments to spool:
6 ; 1) Number of devices to be spooled (may be zero)
7 ; 2) Number of spool files allowed to be open.
8 ; 3) Number of buffers for spooler to use.
9 ; 4) Number of blocks in spool disk file.
10 ; 5) List of 3 character names of devices to be spooled.
11 ; 6) 0 for 'nohold' mode, 1 for 'hold' mode.
12 ; 7) # of blocks which will be remembered for back up.
13 ;
14 ; .MACRO SPOOL SND,SNF,SNB,SNDB,SNAM,SHLD,SNBU
15 ; Define number of spooled devices
16 SPLND = SND
17 SNBUX = SNBU
18 .IF EQ,SNBU
19 SNBUX = 1
20 .ENDC
21 PVSPBL = SNBUX+10. ; # PRIVATE BLOCKS PER DEV
22 SNDBX = SNDB ; TOTAL # OF SPOOL BLOCKS
23 .IF LT <SNDB-<SND*PVSPBL>-2>
24 SNDBX = <SND*PVSPBL>+2
25 .ENDC
26 .IF GT,SPLND
27 ;**
28 ;** Assemble this code if there are spooled devices.
29 ;**
30 SPLNF = SNF ; DEFINE # OF SPOOL FILES
31 SPLNB = SNB ; DEFINE # OF SPOOL BUFFERS
32 NESB: .WORD SPLNB
33 ; DEFINE SPOOL BUFFERS
34 .IF EQ,SPLNB ; THERE MUST BE AT LEAST 1 BUFFER
35 .ERROR ;There must be at least 1 buffer for spooler
36 SPLNB = 1 ;FORCE 1 BUFFER
37 .ENDC
38 SPLBHD: .WORD 0 ;HEAD OF FREE BUFFER CHAIN
39 .IF EQ,SPLNF ;Make sure we have at least 1 file
40 .ERROR ;There must be at least 1 spool file
41 SPLNF = 1 ;FORCE 1 FILE
42 .ENDC
43 ;
44 ; Define spool device control blocks (SDCB)
45 ;
46 SDCB:
47 .REPT SPLND
48 .WORD 0,0,0,0,0 ;SDCHAN
49 .WORD 0,0,0,0,0,0
50 .WORD 0,0,0,0
51 ; INITIAL FORM NAME
52 .ASCII /STD / ;SDFORM
53 .WORD 0,0 ;SDANAM
54 ; GEN INIT FLAGS
55 .IF NE,SHLD
56 .WORD SD$HLD ;SDFLAG
57 .IFF
58 .WORD 0 ;SDFLAG

```

```

58          . ENDC
59          . WORD      0          ; SDSKIP
60          . WORD      PVSPBL     ; SDFRBL
61          ; GEN BACKUP CELLS
62          . REPT      SNBUX
63          . WORD      0
64          . ENDR
65          . WORD      0          ; SDBULS = END OF SDBU
66          . ENDR
67          SDCBND:          ; END OF SDCB AREA
68          ; DEFINE SIZE OF SDCB
69          SDCBSZ =      48. + <2*SNBUX>
70          SDBULS =      SDCBSZ-4.
71          ;
72          ; Define table of device names.
73          ;
74          SPLDEV: . RAD50 // 'SNAM'//          ; DEFINE TABLE OF NAMES
75          . EVEN
76          SPLDVN:          ; END OF TABLE
77          . IF      NE, <<SPLDVN-SPLDEV>-<2*SND>>
78          . ERROR   ; Number of spooled devices not equal to number of names
79          . ENDC
80          SPLANM: . ASCII // 'SNAM'//
81          . EVEN
82          ; Reserve space for spool file channel block
83          SPLCHN: . BLKW      5
84          ;
85          . IFF
86          ;**
87          ;** This code is assembled if there are no spooled devices.
88          ;**
89          SPLND      =      0
90          SPLNF      =      0
91          SPLNB      =      0
92          SDCBSZ     =      1
93          SDBULS     =      1
94          ;
95          SPLDEV:
96          SPLDVN:
97          SPLANM:
98          SPLBHD:
99          SPLCHN:
100         SDCB:
101         SDCBND:
102         NESB:
103         . WORD      0          ; SAY ALL LISTS ARE EMPTY
104         ;
105         . ENDC
106         . ENDM      SPOOL

```

```

1 ;=====
2 ; The TSX-Plus system manager alters values in the following
3 ; section to customize the system for a particular configuration.
4 ;
5 ; System parameters:
6 ;
7 ; Swap file device-file specification (do not place on VM).
8 ;
9 002344 075250 100020 075150 SWDBLK: .RAD50 /SY TSXSWPTSX/
10 002352 100020
11 ;
12 ; Spool file device-file specification (do not place on VM).
13 002354 075250 100020 074514 SPLBLK: .RAD50 /SY TSXSPLTSX/
14 002362 100020
15 ;
16 ; PLAS region swap file specification (do not place on VM).
17 002364 075250 100020 071576 RSFBLK: .RAD50 /SY TSXRSFTSX/
18 002372 100020
19 ;
20 ; File spec for file used to hold user defined command definitions (UCL)
21 002374 075250 100020 101704 UCLDAT: .RAD50 /SY TSXUCLTSX/
22 002402 100020
23 ;
24 ; File spec for temp file used while processing IND command files
25 002404 075250 100020 035164 INDFIL: .RAD50 /SY TSXINDTSX/
26 002412 100020
27 ;
28 ; Maximum amount of memory that can be used by any job (# K bytes).
29 ; This value must not exceed 64. (Kb)
30 000100 HIMEM = 64. ;Max memory that any job may use
31 ;
32 ; Default memory size for jobs that will be in effect when the job
33 ; logs on. (Specify in # K bytes).
34 ;
35 000100 DFLMEM = 64. ;Default memory limit for jobs
36 ;
37 ; SWAPFL controls whether TSX-Plus is allowed to swap jobs to disk if
38 ; insufficient memory is available to hold all active users.
39 ; The normal case (SWAPFL=1) allows TSX-Plus to do job swapping.
40 ; SWAPFL can be set to 0 (zero) in special situations such as when a
41 ; small number of lines are being supported on a floppy disk based system
42 ; that does not have room for a swap file.
43 ; If SWAPFL is set to zero the following actions occur:
44 ; 1. No disk swap file is created.
45 ; 2. A line will not be allowed to log on if there is insufficient
46 ; free memory space to support it.
47 ; 3. Each job is allocated a memory size equal to DFLMEM (default job
48 ; memory size).
49 ; 4. The MEMORY command cannot be used to change the job size.
50 ;
51 000001 SWAPFL = 1 ;1==>Allow job swapping; 0==>Do not swap.
52 ;

```

```

53      ; If the system is generated with job swapping enabled (SWAPFL=1), then
54      ; the SWPSLT parameter controls the number of job slots allocated
55      ; in the swap file. SWPSLT should be in the range 0 up to the
56      ; total number of jobs. If SWPSLT is set to zero, TSX-Plus will
57      ; automatically allocate one job slot in the swap file for each job.
58      ; SWPSLT may be set to a value less than the total number of jobs if
59      ; a small amount of job swapping is anticipated; however, a system
60      ; crash will occur if the system needs to swap a job out of memory
61      ; and no free slot is available in the swap file.
62      ; The SWPSLT parameter has no effect on non-swapping systems (SWAPFL=0).
63      ; The recommended setting for this parameter is 0 (zero).
64      ;
65      000012 SWPSLT = 10. ;Number of job slots in swap file
66      ;
67      ; Number of 512-byte blocks to allocate for swap file that is used
68      ; for extended memory PLAS (Program's Logical Address Space) regions
69      ; that are used by jobs that have virtual overlays or virtual arrays.
70      ; Note that this is the total space in the PLAS swap file for all
71      ; extended memory regions in use at any time by all jobs.
72      ; Note: In a non-swapping system (SWAPFL=0), SEGBLK must be non-zero
73      ; if PLAS support is wanted, but its value does not matter.
74      ;
75      000764 SEGBLK = 500. ;# blocks for PLAS swap file
76      ;
77      ; Number of shared global PLAS regions that can be created by all jobs.
78      ;
79      000014 NGR = 12. ;Number of global PLAS regions
80      ;
81      ; BUSTYP defines the machine bus structure for TSX-Plus. There are two
82      ; possible machine bus structures supported by TSX-Plus - the QBUS (LSI)
83      ; and the UNIBUS. Select one of these parameters below to specify the
84      ; bus support desired. Use the following information for choosing the
85      ; correct bus structure.
86      ;
87      ; QBUS - 11/23, 11/23-Plus, 11/73, and Professional.
88      ; UNIBUS - 11/24, 11/34a, 11/44, and 11/60.
89      ;
90      000001 BUSTYP = QBUS ;Specify machine bus structure (UNIBUS/QBUS)
91      ;
92      ; Memory upper limit size specification expressed in number of k-bytes.
93      ; This parameter controls the maximum memory available for TSX-Plus
94      ; system use. Memory above this upper limit will not be used by the
95      ; operating system.
96      ; If the MEMSIZ parameter is set to 0 (zero), TSX-Plus will use all
97      ; available memory on the machine. To disable the use of extended
98      ; memory, set MEMSIZ to 248 or less.
99      ;
100     000000 MEMSIZ = 0. ;Upper memory limit
101     ;
102     ; The INIABT parameter controls the action taken by TSX-Plus when
103     ; certain errors are detected during system initialization.
104     ; If INIABT=0, TSX-Plus ignores the error and continues running.
105     ; If INIABT=1, TSX-Plus aborts initialization and prints an error message.
106     ;
107     ; *****
108     ; ** The normal and recommended setting for **
109     ; ** this parameter is INIABT=1. It is cleared **

```

```

110 ; ** for default installation. **
111 ; *****
112 ;
113 ; The following initialization errors are controlled by the INIABT flag:
114 ; 1. A device that was specified in TSGEN does not have a
115 ;     TSX-Plus handler on the system disk.
116 ; 2. A time sharing line that was generated into TSX-Plus is not
117 ;     installed on the machine.
118 ; 3. A shared run-time system file could not be found during startup.
119 ;
120 000000 INIABT = 0 ;0==>Continue on error, 1==>Abort on error
121 ;
122 ; The UXIFLG parameter controls the action taken by TSX-Plus when
123 ; an interrupt occurs at an unexpected location. Unexpected interrupts
124 ; may occur if the interrupt vector address specified in a device
125 ; handler does not match the actual interrupt address for which the
126 ; device has been set. Unexpected interrupts can also occur if real-time
127 ; interrupts occur and no connection has been established between the
128 ; real-time interrupt and a TSX-Plus real-time program.
129 ;
130 ; If UXIFLG is set to 1 (one) then unexpected interrupts cause a system
131 ; crash with the error message:
132 ;     ?TSX-F-UEI-Interrupt occurred at unexpected location
133 ;     Argument value = xxxx
134 ; Where "xxxx" is the address at which the interrupt occurred.
135 ;
136 ; If UXIFLG is set to 0 (zero) then unexpected interrupts are ignored
137 ; by the system and do not cause a crash or print an error message.
138 ;
139 ; The recommended setting for UXIFLG is 1 (one).
140 ;
141 000000 UXIFLG = 0 ;Unexpected interrupt control flag
142 ;
143 ; Parameters related to the TSX-Plus system crash dump facility.
144 ; This optional facility will print some useful internal system
145 ; data if a system crash occurs. The dump information can be printed
146 ; on any terminal connected to a DL-11 type line (including DLV-11)
147 ; or on a parallel printer port.
148 ; It is recommended that this facility not be included in the system
149 ; unless you are experiencing system crashes.
150 ;
151 ; Set SYSDMP to 1 if you want the crash dump facility, 0 if not.
152 ;
153 000000 SYSDMP = 0 ;1==>Enable crash dump, 0==>No crash dump
154 ;
155 ; Address of transmitter control register for device to which crash
156 ; dump is to be written. This must be a DL-11 type device controller
157 ; or a parallel printer controller.
158 ; Specify 177564 to dump on the console terminal.
159 ; Specify 177514 to dump to line printer connected to standard parallel port.
160 ;
161 177564 DMPTCR = 177564 ;Transmitter control reg for dump device
162 ;
163 ; Set DMPKTP to 1 if you want a system crash to occur any time a trap
164 ; occurs within the system. Set it to 0 (zero) if you want recoverable
165 ; traps within the system to abort the job but continue execution of the
166 ; system.

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167      ;
168      000000      DMPKTP =      0      ;1==>Always crash on traps within system
169      ;
170      ; The IOABT parameter controls the action taken by TSX-Plus when
171      ; a job terminates execution. If IOABT=0, TSX-Plus will wait for
172      ; all outstanding I/O pending for the job to complete before the job
173      ; is actually terminated. If IOABT=1, TSX-Plus will call the handler
174      ; abort entry point for all outstanding I/O pending for the job.
175      ; Note, the "SET IO [NO] ABORT" keyboard command may be used to
176      ; change the value of this parameter.
177      ;
178      000001      IOABT =      1      ;0==>I/O rundown, 1==>I/O abort
179      ;
180      ; U$CL is a flag that controls whether the User Command Linkage is to
181      ; be used to allow users to define their own commands.
182      ; If U$CL is non-zero the UCL facility is enabled and users may define
183      ; their own system commands. If U$CL is zero, user defined commands
184      ; will not be supported by the system. Note: if the UCL facility is
185      ; enabled, the TSXUCL.SAV file must be placed on the system disk.
186      ;
187      000001      U$CL =      1      ;0==>No UCL program, 1==>UCL program
188      ;
189      ; Number of user-defined commands that can be stored by TSXUCL
190      ; for each job. (The number of blocks required in the SY:TSXUCL.DAT file
191      ; is approximately equal to the number of commands per job times the
192      ; total number of time-sharing lines divided by 5).
193      ;
194      000024      UCLMNC =      20.      ;Maximum user-defined commands per job
195      ;
196      ; The UCLORD parameter selects the default call order for checking
197      ; to see if a command is a user-defined command.
198      ; FIRST ==> Check for user-defined commands before system commands.
199      ; MIDDLE ==> Check after system commands but before command files.
200      ; LAST ==> Check after system commands and command files.
201      ;
202      ; Note that the SET UCL FIRST/LAST keyboard command can be used to
203      ; alter this order on a line-by-line basis.
204      ;
205      000002      UCLORD =      MIDDLE ;Select FIRST / MIDDLE / LAST
206      ;
207      ; The LDSYS flag controls whether the standard system support for
208      ; logical disks (LD) is to be provided.
209      ; If LDSYS is set to 1, system support for logical disks is included.
210      ; If LDSYS is set to 0, system support for logical disks is excluded.
211      ;
212      000001      LDSYS =      1      ;1==>Include LD support, 0==>Exclude LD.
213      ;
214      ; The SLEDIT flag controls whether the Single Line Editor (SL) facility
215      ; is to be made available to the system.
216      ; If SLEDIT is set to 1, Single Line Editor support is included.
217      ; If SLEDIT is set to 0, Single Line Editor support is omitted.
218      ; Single Line Editor support adds approximately 2Kb to the size of the
219      ; mapped portion of the system.
220      ;
221      000001      SLEDIT =      1      ;1==>Include SL support, 0==>Exclude SL
222      ;
223      ; The KEYMAX parameter specifies the number of user-defined keys supported

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224 ; by the single line editor. The DEFINE/KEY command is used to associate
225 ; a user-specified text string with a function key. The maximum number
226 ; of such key definitions that may be in effect at one time for each user
227 ; is controlled by the KEYMAX parameter.
228 ; The maximum supported value for KEYMAX is 60.
229 ;
230 000007 KEYMAX = 7 ;Maximum number of user-defined keys for SL
231 ;
232 ; The MAXWIN parameter specifies the maximum number of terminal display
233 ; windows that may be in use by all jobs on the system.
234 ; If MAXWIN is set to 0 (zero), the display window feature is not included
235 ; in the system. Display windows are useful if you frequently utilize
236 ; subprocesses in that they preserve the screen context when you switch
237 ; between processes.
238 ;
239 000012 MAXWIN = 10 ;Total number of display windows for all jobs
240 ;
241 ; Set DBGFLG to 1 to cause the TSX-Plus program debugging facility
242 ; to be included with the system.
243 ; Set DBGFLG to 0 if the debugging facility is not wanted.
244 ;
245 000000 DBGFLG = 0 ;1==>Include debugger; 0==>Exclude debugger
246 ;
247 ; Number of slots in INSTALL table to reserve for user programs.
248 ;
249 000004 NUIP = 4 ;Number of INSTALL slots for user programs
250 ;
251 ; The following time-slice values are used to schedule jobs for execution.
252 ; Each time value must be specified in 0.1 second units.
253 ;
254 ; QUANO -- Time slice for round-robin scheduling of high-priority
255 ; real-time jobs. That is, jobs with execution priorities
256 ; greater than or equal to PRIHI.
257 ;
258 000002 QUANO = 2 ;Time slice for real-time jobs
259 ;
260 ; QUAN1 -- Time that jobs will remain in a high-priority state after
261 ; they receive an activation character from the terminal.
262 ; A job is classified as "interactive" from the time when an
263 ; activation character is received until the job consumes
264 ; QUAN1 units of time, then the job is classified as "compute
265 ; bound".
266 ;
267 000024 QUAN1 = 20 ;High-priority time for interactive jobs
268 ;
269 ; QUAN1A -- Time that jobs will remain in a high-priority state after
270 ; they are activated because of I/O completion or they are
271 ; restarted following other wait states.
272 ;
273 000002 QUAN1A = 2 ;High-priority time for wait-reactivation
274 ;
275 ; QUAN1B -- Time slice used to switch between "interactive" jobs.
276 ;
277 000002 QUAN1B = 2 ;Time slice for "interactive" jobs.
278 ;
279 ; QUAN1C -- Time job will be allowed to stay in highest execution state
280 ; after receipt of a character from the terminal.

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```

281      ;
282      000001      QUANIC =      1.      ;Time at highest execution state
283      ;
284      ; QUAN2 -- Time that normal priority CPU-bound jobs are allowed to run
285      ;           if there are no high-priority jobs that want to run.
286      ;           This time-slice controls round-robin scheduling of CPU-bound jobs
287      ;           with execution priority values in the range (PRILOW+1) to
288      ;           (PRIHI-1).
289      ;
290      000012      QUAN2 =      10.      ;Normal-priority CPU-bound job time-slice
291      ;
292      ; QUAN3 -- Time slice for round-robin scheduling of very low priority
293      ;           jobs. That is, jobs with priorities less than or equal
294      ;           to PRILOW.
295      ;
296      000024      QUAN3 =      20.      ;Time slice for very low priority jobs
297      ;
298      ; INTIOC -- Number of consecutive times that a job will be allowed to
299      ;           perform I/O operations following input of an activation
300      ;           character from the terminal before the job is classified
301      ;           as non-interactive.
302      ;
303      000036      INTIOC =      30.      ;Number of I/O ops. while "interactive".
304      ;
305      ; HIPRCT -- Number of consecutive times that a job will be given a
306      ;           high-priority execution boost following wait states such
307      ;           as I/O wait before the job will be scheduled as a normal
308      ;           CPU-bound job.
309      ;
310      000050      HIPRCT =      40.      ;Number of consecutive high-priority hits
311      ;
312      ; Time that job will be held in memory after being swapped in from disk.
313      ; A job is not eligible to be swapped out of memory until CORTIM has
314      ; elapsed since it was swapped into memory. However, the job becomes
315      ; immediately eligible to be swapped if it goes into a state where it is
316      ; waiting on any resource other than non-terminal I/O.
317      ; Specify in 0.1 second units.
318      ;
319      000002      CORTIM =      2.      ;Guaranteed memory-residency time
320      ;
321      ; Job priority classes: There are three groups of job priorities,
322      ; the lowest priority group ranges from a job priority 0 up to and
323      ; including the priority equal to the PRILOW parameter. Jobs with
324      ; priorities in this range execute with lower priority than all normal
325      ; time-sharing jobs.
326      ; The second range of priorities is from (PRILOW+1) up to (PRIHI-1).
327      ; Jobs in this range are treated as normal time-sharing jobs.
328      ; The third range of priorities is from PRIHI up to 127. These priorities
329      ; are for real-time jobs which will take unconditional precedence over
330      ; all other jobs.
331      ; All priority values must be in the range 0 to 127.
332      ;
333      000023      PRILOW =      19.      ;Highest "low priority" value
334      000120      PRIHI  =      80.      ;Lowest "high priority" value
335      ;
336      ; PRIDEF -- Default job priority.
337      ;

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338      000062      PRIDEF =      50.      ;Default job priority
339      ;
340      ; PRIVIR -- Amount by which a job's execution priority is reduced
341      ;                when the job is disconnected from the terminal by switching
342      ;                to a subprocess. Note: this only applies to jobs with
343      ;                base priorities in the range (PRILOW+1) to (PRIHI-1).
344      ;
345      000012      PRIVIR =      10.      ;Disconnect job priority reduction
346      ;
347      ; Maximum number of subprocesses per primary process.
348      ;
349      000003      MAXSEC =      3.      ;Max subprocesses per user
350      ;
351      ; Maximum file size (# blocks) that will be returned in response to
352      ; a .ENTER request that specifies a file size of 0 blocks.
353      ;
354      001750      MAXFIL =      1000.    ;Max # blocks for default allocation
355      ;
356      ; Number of 512 byte blocks to hold in memory in a generalized data cache.
357      ; If the CACHE parameter is set to 0 (zero), data caching is not performed.
358      ; Note: The data caching facility adds approximately 2000 bytes to the
359      ; size of the unmapped portion of the system and 528*CACHE bytes to
360      ; the mapped portion of the system.
361      ; The maximum number of blocks that may be held in the cache is 4095. (2MB)
362      ;
363      000454      CACHE =      300.     ;Number of blocks in data cache
364      ;
365      ; The following parameters relate to the cache of file directory entries
366      ; maintained by TSX-Plus. This cache is used to reduce the number of disk
367      ; accesses required to do lookups on frequently accessed files.
368      ; The system disk (SY:) is automatically cached.
369      ; Other devices are only cached if they are introduced to the system
370      ; by use of the MOUNT command.
371      ;
372      ; Maximum number of units that may be cached.
373      ; This includes all logical disks (LD) and all physical disks for which
374      ; directory caching is enabled by use of the MOUNT command.
375      ; (Space required is 18 bytes per unit).
376      ;
377      000036      MAXCSH =      30.     ;Max # device units whose directories to cache
378      ;
379      ; Maximum number of file entries to be held in directory cache.
380      ; (Space required is 18 bytes per entry)
381      ;
382      000074      NMFCSH =      60.     ;Max # file entries to be cached
383      ;
384      ; Maximum number of device units that can be allocated to jobs for exclusive
385      ; use by use of the ALLOCATE command.
386      ;
387      000005      MAXALC =      5.      ;Max # units that can be allocated
388      ;
389      ; Maximum number of simultaneous requests by jobs to monitor other jobs.
390      ;
391      000005      MAXMON =      5.      ;Max # job monitoring requests
392      ;
393      ; The system password is a global password which must be entered
394      ; when a line is initiated before the normal logon sequence begins.

```

```

395 ; The use of a system password is optional and may be enabled on a
396 ; line-by-line basis by specifying the $SYSPS flag with the
397 ; FLAGS macro within the line definition blocks for the lines
398 ; for which the password will be required. If a system password is
399 ; required for a line, an exclamation point prompt is printed as the
400 ; first thing when the line is initiated. The idea is to force the
401 ; calling person to provide a password before printing the normal
402 ; logon greeting which identifies the nature and identity of the site.
403 ;
404 002414 ; SYSPS <TSX> ;System password for all lines with $SYSPS
405 ;
406 ; Amount of time that carrier signal must be lost on dial-up
407 ; lines before we assume the connection has been broken.
408 ; This value is also used to time-out lines which ring and
409 ; do not raise carrier.
410 ; Specify in 0.5 second units.
411 ;
412 000170 TIMEOUT = 120. ;Time allowed for lost carrier
413 ;
414 ; Amount of time that a user may remain connected to a dial-up line
415 ; after logging off before Data Terminal Ready (DTR) will be
416 ; dropped causing the phone to hang up.
417 ; Specify in 0.5 second units.
418 ;
419 000074 OFFTIM = 60. ;Time allowed for job to be logged off
420 ;
421 ; Modem lines ($PHONE in the LINDEF FLAGS macro) are normally
422 ; treated as phone lines if the DCD signal (carrier) is present
423 ; when the lines are started and optionally treated as local lines
424 ; if the signal is not present. The OFFTIM and TIMEOUT parameters
425 ; are only effective if the line is recognized as a phone line when
426 ; started. Set PHONE to 0 to allow lines with the $PHONE
427 ; flag to optionally support local lines. Set PHONE to 1 to
428 ; force the OFFTIM and TIMEOUT parameters to always take effect for
429 ; lines with the $PHONE flag.
430 ;
431 000000 PHONE = 0. ;$PHONE lines may be local if carrier absent
432 ;
433 ; Define Lead-in character that tells TSX-Plus that a special
434 ; terminal control sequence is coming from the program.
435 ;
436 000035 TSLICH = 035 ;Octal 35 = decimal 29.
437 ;
438 ; Define the keyboard control character that will be used to
439 ; switch to a subprocess.
440 ; (Specify the octal value of the ASCII control character)
441 ;
442 000027 VLSWCH = 027 ;Octal 27 = control-W
443 ;
444 ; Define keyboard control character used to cause the current screen
445 ; window contents to be printed.
446 ; (Specify the octal value of the ASCII control character)
447 ;
448 000002 PWCH = 002 ;Octal 02 = control-B
449 ;
450 ; Define keyboard control character that is used to terminate
451 ; a cross-connection between a time-sharing line and a CL line.

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452 ; (Specify the octal value of the ASCII control character)
453 ;
454 000034 CCXTRM = 034 ;Octal 34 = control-\ (control backslash)
455 ;
456 ; Define keyboard control character that is used to signal
457 ; special control functions for a time-sharing line cross-connected
458 ; to a CL line.
459 ; (Specify the octal value of the ASCII control character)
460 ;
461 000001 CCXCTL = 001 ;Octal 001 = control-A
462 ;
463 ; Define the version number to be associated with the CL handler when
464 ; being used with VTCOM. If CLVRSN is defined as 0 then an appropriate
465 ; value will be selected via an internal table. Zero is the suggested
466 ; setting.
467 ;
468 000000 CLVRSN = 0. ;CL version number
469 ;
470 ; Define maximum number of user defined activation characters
471 ; that each line may define during execution.
472 ;
473 000020 MXSPAC = 16. ;Max # user defined activation chars per job
474 ;
475 ; Define maximum number of characters that can be translated by
476 ; the terminal handler. This translation consists of replacing
477 ; a received character by a substitution character on input and replacing
478 ; the substitution character by the original character on output.
479 ; This parameter must be non-zero to use the SET TT TRANSLATE=( ) command.
480 ;
481 000005 MXTTCT = 5. ;Max # chars that terminal handler can translate
482 ;
483 ; Select default system editor.
484 ; The choices are
485 ; EDIT
486 ; TECO
487 ; KED
488 ; K52
489 ;
490 000003 EDITOR = KED ;Default system editor
491 ;
492 ; Select system default implicit or explicit wildcards for CCL commands.
493 ; If WILDFL = 0 then explicit wildcards are selected.
494 ; If WILDFL = 1 then implicit wildcards are selected.
495 ;
496 000001 WILDFL = 1 ;1==>Implicit wildcard, 0==>Explicit wildcard
497 ;
498 ;-----
499 ; The DEVDEF macro must be used to define the names and characteristics
500 ; of all devices which are to be available to TSX-Plus users.
501 ; The form of a device definition is:
502 ;
503 ; DEVDEF <device>[option,...,option]
504 ;
505 ; For each device to be available to the system an entry must be made
506 ; using the DEVDEF macro. This macro requires at least one argument
507 ; but may have several optional arguments as described below:
508 ;

```

```

509 ; 1. The first parameter is the two character device name enclosed
510 ; in angle brackets.
511 ; 2. The optional parameters specify the device characteristics.
512 ; There are nine allowable device attributes which may be
513 ; specified in any order. They are as follows:
514 ;
515 ; DMA Device performs Direct Memory Access (DMA).
516 ; MAPIO Perform I/O mapping (18-bit controllers on 22-bit QBUS).
517 ; EVNBUF Require even byte buffer address for I/O transfers.
518 ; NOCACHE Do not use generalized data cache for this device.
519 ; NOMOUNT Do not allow mounts (i.e., use directory cache) for
520 ; this device.
521 ; REQALC Require device allocation before use.
522 ; MAPH Load the device handler outside the low memory 40K
523 ; byte region and into a mapped handler region.
524 ; NOMAPH Do not load the handler into a mapped handler region
525 ; instead load it into the low memory 40k byte region.
526 ; HANBUF Handler contains an internal I/O buffer.
527 ;
528 ; For standard device drivers, it is important to choose MAPIO when
529 ; 18-bit controllers or handlers will be used on a 22-bit LSI system.
530 ; It is not necessary to specify other device attributes for standard
531 ; TSX-Plus supplied device drivers since TSX-Plus will automatically
532 ; make default selections.
533 ;
534 ; *****
535 ; ** When performing a TSX-Plus **
536 ; ** system generation, remove the **
537 ; ** devices in this list which are **
538 ; ** not present on your system, **
539 ; ** and include those which are. **
540 ; *****
541 ;
542 002442 DEVBEG ;Beginning of device definitions
543 002442 DEVDEF <DW> ;Pro hard disk
544 002442 DEVDEF <DZ> ;Pro floppy disk
545 002442 DEVDEF <NL> ;NULL handler
546 002442 DEVDEF <ZZ>,MAPH ;DBL security handler
547 002442 DEVEND ;End of device definitions
548 ;
549 ; -----
550 ; Parameters related to system I/O buffers used when DMA devices
551 ; with 18-bit controllers are used on Q-bus systems with
552 ; 22-bit addressing (e.g., 11/23-Plus and 11/73).
553 ;
554 ; Number of system buffers allocated for I/O buffering.
555 ; (The recommended number is one per active device that requires buffering.)
556 ;
557 000000 MIONBF = 0 ;Number of system I/O buffers
558 ;
559 ; Size of each system I/O buffer, in units of 512 bytes.
560 ; The maximum allowed value for this parameter is 15.
561 ;
562 000017 MIOBSZ = 15 ;I/O buffer size in units of 512 bytes
563 ;
564 ; -----
565 ; Some device handlers allocate extended memory (PLAS) regions for

```

```

566 ; their use. For example, the DU and MU handlers each require one
567 ; PLAS region. If you are using any other handlers which require
568 ; extended memory regions, include the number of regions required.
569 ;
570 000004 DEVXMR = 4 ;Number of XM regions for device handlers
571 ;
572 ;-----
573 ; Define those devices which are to be spooled by TSX-Plus
574 ; (such as line printers).
575 ; There are seven arguments to the SPOOL macro:
576 ; 1. Number of devices to be spooled (may be zero).
577 ; 2. Number of spool files which may be open by all users.
578 ; 3. Number of spool buffers (512. bytes each).
579 ; 4. Number of blocks in spool disk file.
580 ; 5. List of 3 character names of devices to be spooled.
581 ; 6. Specify 0 if spool files are to be eligible to be
582 ; started as soon as they are created,
583 ; specify 1 if they are to be held until the channel
584 ; is closed. Note: The "SPOOL xx,[NO]HOLD" keyboard
585 ; command can override this parameter.
586 ; 7. Number of blocks which are to be backed up
587 ; when the "SPOOL xx,BACK" command is given.
588 ;
589 ; Note: The SPOOL macro must be present even if
590 ; there are no spooled devices. However, if the first
591 ; argument (number of spooled devices) is zero, no spool
592 ; tables are generated and arguments 2-7 are ignored.
593 ;
594 002442 SPOOL 2,30.,3,250.,<CL2CL3>,0,5.
595 ;
596 ;-----
597 ; Define parameters pertaining to record (block) locking
598 ; for shared files. If the shared file block locking
599 ; facility is not wanted, set all of these parameters to
600 ; 0 (zero).
601 ;
602 ; Maximum number of shared files which may be open
603 ; simultaneously. Note that several users accessing the same
604 ; file count as 1.
605 ;
606 000062 MAXSF = 50. ;Max number of shared files
607 ;
608 ; Maximum number of I/O channels which all users may
609 ; simultaneously have open to shared files.
610 ; Note, this is the total number for all users not
611 ; for each user.
612 ;
613 000144 MAXSFC = 100. ;Max # shared file channels
614 ;
615 ; Maximum number of blocks which may be simultaneously
616 ; held locked by any channel. That is, max blocks
617 ; locked per channel.
618 ;
619 000003 MXLBLK = 3. ;Max blocks locked per channel
620 ;
621 ; Number of 512-byte blocks to be held in the in-memory data
622 ; cache for shared files.

```

```

623 ; (Note that the MAXSF, MAXSFC, and MXLBLK parameters must be
624 ; non-zero to enable shared file data caching.)
625 ;
626 000000 NUMDC = 0 ;Number of blocks in shared file data cache
627 ;
628 ;-----
629 ; Define parameters pertaining to the inter-program
630 ; message communication feature. If this feature is
631 ; not wanted, set all four parameters to 0 (zero).
632 ;
633 ; Maximum number of message communication channels
634 ; which may be simultaneously in use.
635 ;
636 000005 MAXMC = 5 ;Max message channels
637 ;
638 ; Maximum message length (bytes).
639 ;
640 000310 MSCHRS = 200 ;Max message length (bytes)
641 ;
642 ; Maximum number of messages which may be held in queue.
643 ;
644 000006 MAXMSG = 6 ;Max queued messages
645 ;
646 ; Maximum number of requests for messages that may be held in queue
647 ;
648 000005 MAXMRB = 5 ;Max # pending message requests
649 ;
650 ;-----
651 ; The RTVECT parameter specifies the number of real-time interrupt vectors
652 ; that can be connected to TSX-Plus jobs. Set RTVECT to the maximum number
653 ; of interrupt vectors that all running real-time programs may be connected
654 ; to at the same time.
655 ; (Note: The basic real-time support facility is now a standard part of
656 ; TSX-Plus and it is no longer necessary to set RTVECT to 1 to include
657 ; real-time facilities such as locking a job in memory or accessing the
658 ; I/O page. It is also no longer necessary to set RTVECT to 1 to allow
659 ; use of the SYSMON program. RTVECT should be set to 0 (zero) unless some
660 ; real-time interrupts are going to be connected to TSX-Plus jobs.)
661 ;
662 000000 RTVECT = 0 ;Max # interrupt vectors that may be connected
663 ;
664 ;-----
665 ; Define the size of the table within TSX-Plus used to hold information
666 ; when the performance monitoring feature is being used.
667 ; Each word in this table corresponds to one cell in the histogram.
668 ; Specify the size as number of bytes for the table.
669 ; (Note: The maximum allowed size is 8192 bytes)
670 ;
671 000000 PMSIZE = 0 ;Size of performance monitor table (bytes)
672 ;
673 ;-----
674 ; Use the RTDEF macro at this point to specify information about
675 ; any shared run-time systems to be loaded when TSX-Plus is started.
676 ;
677 ; The form of the RTDEF macro is
678 ; RTDEF <name>, r-flag, skip-count
679 ;

```

```

680 ; Where
681 ; - Name is the 12 character name of the file containing the run-time system
682 ; which must be specified in the form DevFilnamExt -- that is, three
683 ; character device name, six character file name and three character
684 ; extension.
685 ; - R-flag is either R if user programs are to have read-only access to
686 ; the run-time system, or RW if read-write access is to be granted.
687 ; - Skip-count is the number of blocks to be skipped over at the front
688 ; of the file when loading it.
689 ;
690 ; Example:
691 ; RTDEF <SY CBR063SHR>,R,1. ;COBOL-Plus shared run-time
692 ; RTDEF <SY DBLSHRRTS>,R,1. ;DBL shared run-time
693 ; RTDEF <SY DB4RTSSHR>,R,0. ;DBL V4 shared run-time
694 ;

```

```

1 ;-----
2 ; Time-sharing line parameters:
3 ;
4 ; Default input and output character buffer sizes.
5 ; These buffer sizes will be used for lines that don't use
6 ; the BUFSIZ macro within their line definitions to declare
7 ; their character buffer sizes.
8 ; These buffer sizes are also used for all subprocesses.
9 ;
10 000276 DINSPC = 190. ;Default input char buffer size
11 000360 DOTSPC = 240. ;Default output char buffer size
12 ;
13 ; When the terminal-output character buffer is filled a job is suspended.
14 ; The job is restarted after characters are printed from the buffer and
15 ; there are OTRASZ characters remaining in the buffer.
16 ;
17 000031 OTRASZ = 25. ;Reactivation character count
18 ;
19 ; A software character "silo" is used to hold characters received
20 ; from time-sharing lines until they can be processed by the system.
21 ; The silo is used to prevent the loss of characters during high
22 ; speed input. Each time-sharing line and CL line has its own silo.
23 ; If the input to the line is coming from a terminal, the silo can be
24 ; quite small. On the other hand, if the input is coming from another
25 ; computer or other high speed device, the silo size should be increased.
26 ; The NCSILO, NCXOFF, and NCXON parameters set default values pertaining
27 ; to the silos. The SILO macro can be used within a line definition
28 ; to specify silo parameters for a specific line.
29 ;
30 ; Default size of input character silos.
31 ;
32 000062 NCSILO = 50. ;Default silo size
33 ;
34 ; The system will transmit a control-S (XOFF) character when an input
35 ; silo is filled to the point where there are only NCXOFF free
36 ; character positions remaining.
37 ;
38 000014 NCXOFF = 12. ;Default XOFF point for silos
39 ;
40 ; If the system sends an XOFF because a silo becomes nearly full,
41 ; it will send an XON to restart transmission when there are only
42 ; NCXON characters remaining in the silo.
43 ;
44 000004 NCXON = 4. ;Default XON point for silos
45 ;
46 ; Number of "extra" CL (communication line) units to be genned into
47 ; system. These CL units are not initially assigned to any line but
48 ; may be used "take over" a time-sharing line to use it as a CL unit.
49 ; The total number of CL units (those defined using CLDEF blocks plus
50 ; the extra units) may not exceed 16. The first 8 CL units are
51 ; named CLO to CL7, the second 8 are named C10 through C17.
52 ;
53 000004 CLXTRA = 4. ;Number of extra CL units.
54 ;
55 ; Default output ring buffer size for I/O communication lines defined
56 ; with the CLDEF macro and accessed as "CL" devices.
57 ; The recommended value is ((3*baud_rate)/1000+2).

```

```

58      ;
59      000040      CLORSZ =      32.      ;Size of CL output ring buffers
60      ;
61      ;-----
62      ; Flags which can be used with the FLAGS macro within
63      ; a line definition block to define line characteristics.
64      ;
65      100000      $SCOPE =      100000 ;ON==>CRT type terminal
66      040000      $ECHO  =      40000  ;ON==>Echo characters to terminal
67      020000      $TAPE  =      20000  ;ON==>"Paper-tape" mode (do x-on/x-off control, etc.)
68      010000      $BBIT  =      10000  ;ON==>Support 8 bit (rather than 7 bit) characters.
69      004000      $START =      4000   ;ON==>Automatically start line during initialization
70      001000      $TAB   =      1000   ;ON==>Do not simulate tabs (Terminal handles tab char)
71      000400      $FORM  =      400    ;ON==>Do not simulate form-feeds (Terminal handles FF)
72      000200      $AUTO  =      200    ;ON==>Do autobaud speed selection for line
73      000100      $PAGE  =      100    ;ON==>Enable ctrl-S/ctrl-Q input processing
74      000040      $LC    =      40     ;ON==>Enable lower-case input
75      000020      $NOSUB =      20     ;ON==>Disallow use of subprocesses
76      000010      $DEFER =      10     ;ON==>Do deferred character echoing (recommended)
77      000004      $QTSET =      4      ;ON==>Set tt quiet (Don't list command files)
78      000002      $SYSPS =      2      ;ON==>Require system password before logon
79      000001      $PHONE =      1      ;ON==>Dial-up, modem connected line
80      ;
81      ; Default line flags that will be used for each line that does
82      ; not explicitly specify flags using a FLAGS macro.
83      ;
84      040150      NRMFLG =      $ECHO!$DEFER!$PAGE!$LC
85      ;
86      ;-----
87      ; Terminal type names that are legal to used with the TRMTYP macro
88      ; within a line definition block to define the terminal type.
89      ;
90      ; VT100 ==> DEC VT100
91      ; VT200 ==> DEC VT200 with 7 bit control codes
92      ; VT52  ==> DEC VT52
93      ; LA36  ==> DEC LA36
94      ; LA120 ==> DEC LA120
95      ; HAZEL ==> Hazeltine brand terminals
96      ; ADM3A ==> Lear Siegler ADM3A
97      ; DIABLO==> Diablo brand terminals (with X-ON/X-OFF protocol)
98      ; QUME  ==> Qume brand terminals (with X-ON/X-OFF protocol)
99      ;

```

```

1 ;-----
2 ; Line definitions
3 ;
4 ; The TBLDEF macro call requires four arguments:
5 ; 1. The number of real (physical) time-sharing lines on machine.
6 ; 2. The number of subprocess jobs.
7 ; 3. The number of detached jobs.
8 ; 4. The number of dedicated CL lines.
9 ;
10 002656 ; TBLDEF 7.,3.,2.,0. ;# Real, # Subprocess, # Detached, # CL lines
11 ;
12 ; Define primary (real) time-sharing lines
13 ;
14 010006 ; LINDEF 60,177560,OPER ;Use console terminal as t/s term
15 010006 ; NAME <Console>
16 010006 ; CMDFIL LINE1.TSX
17 010006 ; TRMTYP VT100
18 010006 ; FLAGS NRMFLG!$START!$SCOPE!$TAB
19 010006 ; LINEND
20 ;
21 010026 ; LINDEF 220,173400 ;Printer port
22 010026 ; NAME <Printer port>
23 010026 ; FLAGS NRMFLG!$AUTO
24 010026 ; CMDFIL LINE2.TSX
25 010026 ; TRMTYP VT100
26 010026 ; LINEND
27 ;
28 010046 ; LINDEF 210,173300 ;Communications port
29 010046 ; NAME <Com. port>
30 010046 ; FLAGS NRMFLG!$AUTO!$PHONE
31 010046 ; CMDFIL LINE3.TSX
32 010046 ; TRMTYP VT100
33 010046 ; LINEND
34 ;
35 ; Define lines on Pro quad serial line unit
36 ;
37 010066 ; MUXDEF 300,160000 ;Quad serial line unit
38 ;
39 ; Line 0 on quad serial line unit
40 ;
41 010066 ; LINDEF 0
42 010066 ; NAME <QSL 0>
43 010066 ; TRMTYP VT100
44 010066 ; CMDFIL LINE3.TSX
45 010066 ; FLAGS NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
46 010066 ; LINEND
47 ;
48 ; Line 1 on quad serial line unit
49 ;
50 010106 ; LINDEF 1
51 010106 ; NAME <QSL 1>
52 010106 ; TRMTYP VT100
53 010106 ; CMDFIL LINE3.TSX
54 010106 ; FLAGS NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB
55 010106 ; LINEND
56 ;
57 ; Line 2 on quad serial line unit

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75 010166
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81 010166
82 010310
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;  
; LINDEF 2  
; NAME <QSL 2>  
; TRMTYP VT100  
; CMDFIL LINE3.TSX  
; FLAGS NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB  
; LINEND  
;  
; Line 3 on quad serial line unit  
;  
; LINDEF 3  
; NAME <QSL 3>  
; TRMTYP VT100  
; CMDFIL LINE3.TSX  
; FLAGS NRMFLG!$AUTO!$PHONE!$SCOPE!$TAB  
; LINEND  
;  
; MUXEND  
;  
; ;  
; Use the "DETACH" macro here to declare any start-up command  
; files to be run as detached jobs.  
;  
; DETACH SY:DET1.TSX ; Start-up detach job command file  
; DETACH SY:DET2.TSX ; Start-up detach job command file  
;  
; =====  
; END OF SECTION OF TSGEN TO BE ALTERED BY USER  
; =====
```

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.LIST MD
.LIST CND
.ENDC

```

1 ;-----
2 ; Finish building tables
3 ;
4 ; Make sure memory size parameters are reasonable.
5 ;
6 .IF GT,HIMEM-64.
7 .ERROR ;HIMEM may not exceed 64.
8 HIMEM = 64.
9 .ENDC
10 .IF GT,DFLMEM-HIMEM
11 DFLMEM = HIMEM
12 .ENDC
13 ;
14 ; Make sure silo parameters are reasonable
15 ; Actual silo limit is specified by MAXSLO
16 ;
17 .IIF GT,<NCSILO-255.> NCSILO = 255.
18 000027 S = <NCSILO/2>-2
19 .IIF GT,<NCXOFF-S> NCXOFF = S
20 000014 NCXOFF = NCXOFF&377 ;MUST BE BYTE SIZE
21 .IIF GT,<NCXON-S> NCXON = S
22 000004 NCXON = NCXON&377 ;MUST BE BYTE SIZE
23 ;
24 ; Make sure last line definitions were properly terminated
25 ;
26 .IF NE BO
27 .ERROR 1 ; Missing LINEND for last line
28 LINEND
29 .ENDC
30 .IF NE CURMX
31 .ERROR 1 ; Missing MUXEND
32 MUXEND
33 .ENDC
34 ;
35 ; Make sure the right # of lines were defined.
36 ;
37 .IF NE <NPLDF-NPL>
38 .ERROR 2; Wrong number of primary lines defined
39 .ENDC
40 .IF NE <NCLDF-NIOL>
41 .ERROR 2; Wrong number of CL lines defined
42 .ENDC
43 .IF GT <NDLDF-NDL>
44 .ERROR 2; Wrong number of detached jobs defined
45 .ENDC
46 ;
47 ; Define any additional detached job lines.
48 ;
49 000000 .REPT <NPL+NDL-LN>
50 DETACH
51 .ENDR
52 .IF NE <LN-NPL-NDL>
53 .ERROR 2 ; Wrong number of lines defined
54 .ENDC
55 .IF NE <NCLDF-NIOL>
56 .ERROR 2; Wrong number of CL lines defined
57 .ENDC

```

```

58 ;
59 ; Define tables for subprocesses (if any)
60 ;
61 ; .IF NE NSL
62 000003 .REPT NSL
63 BO = 1 ; BEGIN BLOCK
64 LN = LN+1
65 LX = LX+2
66 CLX = LX
67 BUFSIZ DINSPC, DOTSPC
68 LINEND
69 . ENDR
70 . ENDC
71 010432 . CSECT TSGEN
72 ;
73 ; Define mux interrupt entry vectors
74 ;
75 ; Input interrupt entry points
76 000001 .REPT LSTMX/2
77 INCB MUXNUM
78 . ENDR
79 010436 000167 0000000 INMXV: JMP ININT
80 ; Output interrupt entry points (set up by TSINIT)
81 010442 OTMXV: .BLKW 3*<LSTMX/2>
82 ;
83 ; Generate tables for Unibus map registers
84 ;
85 ; .GLOBL UMRBAS, UMREND, UMRWHD
86 010450 000000 UMRWHD: .WORD 0
87 .MACRO UMRDEF NUM
88 .BYTE CURUMR ;UM$UMR
89 .BYTE NUM ;UM$NMR
90 .WORD NUM*4096. ;UM$WDS
91 .WORD 0 ;UM$IDQ
92 CURUMR = CURUMR+NUM
93 . ENDM UMRDEF
94 ; Define UMR sets in order of size -- small to large.
95 000005 CURUMR = 5 ;Map regs 0-4 always mapped by init code.
96 010452 UMRBAS:
97 .IF EQ,<BUSTYP-UNIBUS> ;Generate only for UNIBUS machines
98 UMRDEF 1.
99 UMRDEF 1.
100 UMRDEF 4.
101 UMRDEF 4.
102 UMRDEF 8.
103 UMRDEF 8.
104 . ENDC
105 010452 UMREND:
106 ;
107 ; Check file and device caching parameters
108 ;
109 .IF LT,<MAXCSH-1> ;MAKE SURE WE CACHE AT LEAST 1 DEVICE
110 MAXCSH = 1
111 . ENDC
112 .IF LT,<NMFCSH-4> ;MINIMUM NUMBER OF CASHED FILES
113 NMFCSH = 4
114 . ENDC

```

```
115 ;
116 ; Generate tables to keep track of allocated devices
117 ;
118 . IF LT <MAXALC-1> ; Make sure we have at least 1 entry
119 MAXALC = 1
120 . ENDC
121 010452 ALCTBL: ; Base of device allocation table
122 000005 . REPT MAXALC
123 . WORD 0 ; AD$DVU
124 . BYTE 0 ; AD$JOB
125 . BYTE 0 ; AD$FLG
126 . ENDR
127 010476 ALCEND: ; End of device allocaton table
128 ;
129 ; Check validity of PMSIZE
130 ;
131 . IF GT <PMSIZE-8192.> ; PMSIZE MAY NOT EXCEED 8192.
132 . ERROR 0; PMSIZE may not exceed 8192.
133 PMSIZE = 8192.
134 . ENDC
135 ;
136 ; Check validity of MIOBSZ
137 ;
138 . IF GT <MIOBSZ-15.>
139 . ERROR 0; MIOBSZ may not exceed 15.
140 MIOBSZ = 15.
141 . ENDC
142 ;
143 ; Check validity of CACHE parameter
144 ;
145 . IF GT <CACHE-4095.>
146 CACHE = 4095.
147 . ENDC
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000002

```
-----  
; 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  
;  
; . REPT NDRTDF  
RTDEF <$$ >,R,0  
; . ENDR
```

```

1      ;-----
2      ;   Generate tables for real-time support facility.
3      ;
4      ;   Generate the vector control blocks
5      ;
6      .   GLOBAL   VCBBAS, VCBEND
7 010476 VCBBAS:
8          .   REPT   RTVECT
9          JSR      R2, @#RTINT
10         .   WORD   0, 0, 0           ; Must match size defined in TSDEFS
11         .   ENDR
12 010476 VCBEND:
13         NUMIOQ =   NUMIOQ+RTVECT   ; ADD I/O QUEUE ELEMENTS FOR INT COMPL ROUTINES
14         NUMSYQ =   NUMSYQ+RTVECT
15         ;
16         .   IF    NE, RTVECT
17         ;**
18         ;** Assemble this code if real-time support is wanted
19         ;**
20         .   GLOBAL RTINT
21         .   ENDC           ; End of real-time conditional
22         ;
23         ;-----
24         ;   Conditional code for different types of terminals.
25         ;
26         .   IF    NE, DHUSE
27         ;**
28         ;** Assemble this code if DH11 support is needed
29         ;**
30         .   IFF
31         ;**
32         ;** Assemble this code if DH11 support is not needed
33         ;**
34         .   GLOBAL TSDHIO, DHSTRT, DHSTOP, DHOINT
35         .   GLOBAL VHSTRT, VHOINT, DHTIMR, VHSTOP
36         .   GLOBAL DHXON, DHXOFF, VHXOFF, VHXON
37 000000 TSDHIO =   0
38 010476 DHTIMR:
39 010476 DHSTRT:
40 010476 DHSTOP:
41 010476 DHXON:
42 010476 DHXOFF:
43 010476 DHOINT:
44 010476 VHSTRT:
45 010476 VHSTOP:
46 010476 VHXON:
47 010476 VHXOFF:
48 010476 VHOINT:
49 010476 000207 RETURN
50         .   ENDC           ; End of DH11 conditional code
51         ;
52         ;-----
53         ;   Conditional code for CL units
54         ;
55         .   GLOBAL CL$OPT, CL$STA, CL$COL, CL$RQH, CL$WQH
56         .   GLOBAL CL$ORB, CL$ORA, CL$ORS, CL$ORQ, CL$ORP, CL$ORE
57         .   GLOBAL CL$LEN, CL$LIN, CL$WID, CL$SKP, CL$LIX

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58          .GLOBL  CL$EPN,CL$EPS,CL$EPP,CL$XLN,CLSTS
59          ;
60          ; Define CL device status word. See the RT-11 .DSTATUS or .DRDEF macros
61          ; for status bit definitions. The device type code is the same as XL.
62          ; (To make file names appear in SHOW QUEUE for spooled CL device,
63          ; add the SPECL$ flag (10000).)
64          ;
65          006057 CLSTS = 4000+2000+57          ;HNDLR$+SPFUN$+XL$COD
66          ;
67          .IF      NE,CLVRSN          ; Test to see if CLVRSN is defined as 0
68          .IF      LE,<CLVRSN-14.> ; or greater than 14.
69          .ERROR 0;Minimum CL version number is 15. ;If not report an error
70          CLVRSN = 15.          ; and set to a reasonable number
71          .ENDC          ; End conditional LE,<CLVRSN-14.>
72          .ENDC          ; End conditional NE,CLVRSN
73          ;
74          ; Define table that tells which line is associated with each CL unit.
75          ; Note, this table is always generated. Even if there are no CL lines
76          ; genned in.
77          ;
78          010500 000000 000000 000000 CL$LIX: .WORD 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 ;Line index for each CL unit
79          010506 000000 000000 000000
80          010514 000000 000000 000000
81          010522 000000 000000 000000
82          010530 000000 000000 000000
83          010536 000000
84          ;
85          ; Macro to define CL tables which have one entry per CL unit
86          ;
87          .MACRO  CLTABL NAME
88          NAME:
89          .REPT  CLTOTL
90          .WORD  0
91          .ENDR
92          .ENDM  CLTABL
93          ;
94          .IF      NE,CLTOTL          ; Assemble if there are CL units
95          ;**
96          ;** Assemble this code if there are CL units
97          ;**
98          CLTABL CL$OPT          ;Option flags (CO$xxx)
99          CLTABL CL$STA          ;Status flags (CM$xxx)
100         CLTABL CL$COL          ;Current column position
101         CLTABL CL$LEN          ;Number of lines per page
102         CLTABL CL$LIN          ;Current line number
103         CLTABL CL$XLN          ;Number of line CL unit is cross connected to
104         CLTABL CL$SKP          ;Number of lines to skip at bottom of page
105         CLTABL CL$WID          ;Maximum allowed line width
106         CLTABL CL$RQH          ;Internal queue head for read requests
107         CLTABL CL$WQH          ;Internal queue head for write requests
108         CLTABL CL$ORB          ;Start of output ring buffer
109         CLTABL CL$ORE          ;End of output ring buffer
110         CLTABL CL$ORP          ;Pointer where next char goes in output ring
111         CLTABL CL$ORG          ;Pointer to next char to get from output ring
112         CLTABL CL$ORA          ;Allocated size of output ring buffer
113         CLTABL CL$ORS          ;Free space in output ring buffer
114         CLTABL CL$EPN          ;Number of Form-feeds for end page

```

```

110 010750          CLTABL CL$EPS          ;Pointer to end-of-file string buffer
111 010760          CLTABL CL$EPP          ;Pointer to next char within EOF string buffer
112                ;
113                . IFF                    ;Assemble if no CL units
114                ;**
115                ;** Assemble this code if there are no CL units
116                ;**
117                . GLOBL CLOTIR, CLSIZE, CLHEAD, CLLQE, CLCQE, CLINIR, CLABF
118                . GLOBL TSCLR
119                TSCLR = 0
120                CLSIZE = 0
121                CLHEAD = 0
122                ;
123                CLCQE:
124                CLLQE:
125                CL$OPT:
126                CL$STA:
127                CL$COL:
128                CL$LEN:
129                CL$LIN:
130                CL$XLN:
131                CL$SKP:
132                CL$WID:
133                CL$RQH:
134                CL$WQH:
135                CL$ORB:
136                CL$ORE:
137                CL$ORP:
138                CL$ORQ:
139                CL$ORA:
140                CL$ORS:
141                CL$EPN:
142                CL$EPS:
143                CL$EPP:
144                . WORD 0
145                ;
146                CLINIR:
147                CLOTIR:
148                CLABF:
149                RETURN
150                ;
151                . ENDC                    ;End conditional (NE, CLTOTL)
152                ;
153                ;-----
154                ; Define some misc data cells
155                ;
156 010770 000012 NMFREQ: . WORD NUMIOQ-NUMSYQ ;# I/O queue elements available for user jobs
157                ;
158                ; Invoke dummy SYSPS if user commented it out
159                ;
160                . IIF EQ, SYSPSS SYSPS <>
161                ;
162                ; Make sure PHONE parameter is 0 or 1
163                ;
164                . IIF NE, PHONE PHONE = 1
165                ;
166                ; Close out some CSECTS.

```

```

167
168 000034
169 000034
170 000240
171
172 000000
173 000000 123456
174
176
177
178
179
180
181 000000
182 000050 000050
183 000050 0000000
184 000014 000014
185 000014 0000000
186 000016 0000000
187
188 000001

```

```

;
; .CSECT RDBSEC
RDBEND:
; .CSECT SASECT
; .EVEN
; .CSECT GENTOP
GENTOP: .WORD 123456 ;Flag word for top of tsgen
; .IF NE FULLST
; .LIST BIN
; .ENDC ;NE FULLST
;
; Define address of top of resident portion of TSX-Plus
;
; .ASECT
; = 50
; .WORD PROITP
; = 14
; .WORD SCHED
; .WORD DSKBUF
;
; .END

```

Errors detected: 0

*** Assembler statistics

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

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

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

Cross reference table (CREF V05.04)

	18-28	18-28	18-28	18-28#	18-28#	18-28#	18-28#	18-29	18-29#	18-31	18-31#	18-32	18-32#
	18-33	18-33	18-33	18-33	18-33	18-33	18-33	18-33	18-33	18-33	18-33	18-33#	18-33#
	18-33#	18-33#	18-33#	18-33#	18-33#	18-33#	18-33#	18-37	18-37#	18-41	18-41	18-41#	18-41#
	18-42	18-42#	18-43	18-43#	18-44	18-44#	18-44#	18-46	18-46	18-46	18-46	18-46	18-46
	18-46	18-46	18-46	18-46	18-46#	18-46#	18-46#	18-46#	18-46#	18-46#	18-46#	18-46#	18-46#
	18-50	18-50	18-50#	18-50#	18-51	18-51#	18-51#	18-52	18-52#	18-53	18-53#	18-55	18-55
	18-55	18-55	18-55	18-55	18-55	18-55	18-55	18-55	18-55	18-55#	18-55#	18-55#	18-55#
	18-55#	18-55#	18-55#	18-55#	18-59	18-59	18-59	18-59#	18-59#	18-60	18-60#	18-61	18-61#
	18-62	18-62#	18-64	18-64	18-64	18-64	18-64	18-64	18-64	18-64	18-64	18-64	18-64
	18-64#	18-64#	18-64#	18-64#	18-64#	18-64#	18-64#	18-64#	18-64#	18-68	18-68	18-68#	18-68#
	18-69	18-69#	18-70	18-70#	18-71	18-71#	18-71#	18-73	18-73	18-73	18-73	18-73	18-73
	18-73	18-73	18-73	18-73	18-73#	18-73#	18-73#	18-73#	18-73#	18-73#	18-73#	18-73#	18-73#
	18-81	18-81	18-81	18-81#	18-82	18-82	18-82	18-82	18-82#	20-18#	20-19	20-21	20-69
	20-69	20-69	20-69	20-69	20-69	20-69	20-69	20-69	20-69	20-69#	20-69#	20-69#	20-69#
	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#	20-69#
S110	4-364#												
S1200	4-369#												
S134.5	4-365#												
S150	4-366#												
S1800	4-370#												
S19200	4-377#												
S2000	4-371#												
S2400	4-372#												
S300	4-367#												
S3600	4-373#												
S4800	4-374#												
S50	4-362#												
S600	4-368#												
S7200	4-375#												
S75	4-363#												
S9600	4-376#	9-137											
SASECT	1-48	10-6#											
SCHED	1-136	4-40	22-185										
SCPFHD	1-51	4-97#											
SD#HLD	1-131												
SDBULS	1-91	16-594#											
SDCB	1-54	16-594#											
SDCBND	1-54	16-594#											
SDCBSZ	1-91	16-594	16-594#										
SEGBLK	4-31	16-75#											
SEGCHN	1-90	4-58#											
SETERR	1-131												
SFCB	1-68	4-83#											
SFCBFH	1-53	4-85#											
SFCBND	1-68	4-84#											
SFCLS	1-125	4-162#											
SFRSST	1-124	4-156#											
SFSVST	1-124	4-155#											
SFWRIT	1-125	4-163#											
SHRRCB	1-51	4-89#											
SHRRCN	1-51	4-90#											
SILSIZ	18-14#	18-19	18-21#	18-26	18-28#	18-33	18-41#	18-46	18-50#	18-55	18-59#	18-64	
	18-68#	18-73											
SILXOF	18-14#	18-19	18-21#	18-26	18-28#	18-33	18-41#	18-46	18-50#	18-55	18-59#	18-64	
	18-68#	18-73											
SILXON	18-14#	18-19	18-21#	18-26	18-28#	18-33	18-41#	18-46	18-50#	18-55	18-59#	18-64	

	18-68#	18-73						
SIZMEM	4-324	4-324	4-324	4-324	4-324#	4-324#		
SLEDIT	4-180	16-221#						
SMONHD	1-48	4-82#						
SMRSIZ	1-116	4-334#						
SNBUX	1-89	16-594	16-594	16-594	16-594	16-594#		
SNDBX	1-87	4-87	16-594#					
SNMSHD	1-108	4-75#						
SPLANM	1-91	16-594#						
SPLBHD	1-53	16-594#						
SPLBLK	1-55	16-13#						
SPLCHN	1-101	16-594#						
SPLDEV	1-54	16-594	16-594#					
SPLDVN	1-54	16-594	16-594#					
SPLNB	1-52	16-594	16-594	16-594#				
SPLND	1-52	16-594	16-594	16-594#				
SPLNF	1-52	4-86	16-594	16-594#				
SPOLID	1-118	4-104#						
SPSTAT	1-61	3-97#						
SPUSR	1-99	3-69#						
SR3FLG	1-115	4-204#						
SRERR	18-14	18-14#	18-21	18-21#	18-28	18-28#	18-37	18-37#
SRTSIZ	1-116	4-336#						
STPFLG	1-94	4-202#						
SWAPFL	4-173	16-51#	18-10					
SWDBLK	1-65	16-9#						
SWPCHN	1-102	3-192#	3-211					
SWPSLT	4-30	16-65#	18-10	18-10				
SYCHO	1-95	3-42#						
SYCH1	1-95	3-43#						
SYCH10	1-96	3-50#						
SYCH11	1-96	3-51#						
SYCH12	1-96	3-52#						
SYCH13	1-96	3-53#						
SYCH14	1-97	3-54#						
SYCH15	1-97	3-55#						
SYCH16	1-97	3-56#						
SYCH17	1-97	3-57#	3-202					
SYCH2	1-95	3-44#						
SYCH20	1-97	3-58#						
SYCH3	1-95	3-45#						
SYCH4	1-95	3-46#						
SYCH5	1-95	3-47#						
SYCH6	1-96	3-48#						
SYCH7	1-96	3-49#						
SYINDX	1-105	3-85#						
SYNAME	1-106	4-108#						
SYNCH	1-132	3-81						
SYPSPR	1-47	4-210#						
SYPSPD	1-47	16-404	16-404	16-404#				
SYSCHN	1-95	3-41#	3-201					
SYSDAT	1-98	3-62#	3-204					
SYSDMP	4-171	16-153#						
SYSGEN	1-105	3-88#						
SYSPSS	10-177#	16-404#	22-160					
SYSUPD	1-99	3-72#						

VMXSFC	1-90	4-15#								
VMXWIN	1-55	4-34#								
VNCSL0	1-71	4-42#								
VNCXOF	1-71	4-43#								
VNCXON	1-71	4-44#								
VNFCSH	1-85	4-20#								
VNGR	1-51	4-32#								
VNRFLG	1-69	4-39#								
VNUIP	1-51	4-36#								
VNUMDC	1-81	4-16#								
VOFFTM	1-86	4-23#								
VPLAS	1-90	4-31#								
VPRIDF	1-99	4-184#								
VPRIHI	1-98	4-183#								
VPRILO	1-98	4-182#								
VPRIVR	1-64	4-185#								
VQUANO	1-73	4-4#								
VQUAN1	1-83	4-5#								
VQUAN2	1-83	4-9#								
VQUAN3	1-73	4-10#								
VQUN1A	1-83	4-6#								
VQUN1B	1-83	4-7#								
VQUN1C	1-69	4-8#								
VSCHED	1-72	4-40#								
VSLEDT	1-56	4-180#								
VSWPFL	1-92	4-173#								
VSWPSL	1-55	4-30#								
VSXDMP	1-70	4-171#								
VT100	1-133	18-17	18-25	18-32	18-43	18-52	18-61	18-70		
VT200	1-133									
VT52	1-133									
VTMOUT	1-87	4-22#								
VTSLCH	1-73	4-186#								
VU#CL	1-52	4-177#								
VUCLMC	1-115	4-18#								
VUCLOR	1-115	4-178#								
VUSPHN	1-126	4-194#								
VUXIFL	1-62	4-176#								
VVLSCH	1-73	4-187#								
VVPWCH	1-73	4-188#								
WILDFL	1-64	16-496#								
WINBAS	1-80	4-67#								
X	16-543	16-543#	16-544	16-544#	16-545	16-545#	16-546	16-546#	16-547	16-547#

Cross reference table (CREF V05.04)

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