PRO/TSX PLUS™
Installation Guide

s&h computer systems, inc.

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PRO/TSX-Plus™ INSTALLATION INSTRUCTIONS

Important Note: The PRO/TSX-Plus distribution disk is copy protected, do not attempt to copy it before installing it as this may make it impossible to perform an installation.

The distribution disk may be copied for backup purposes as you desire, but only after it has been "unlocked" by the installation procedure. Also note that the distribution disk may only be used to install PRO/TSX-Plus on a single computer. Contact S&H if you require additional distribution disks for other Professional computers.

Perform the following steps to install PRO/TSX-Plus on your Professional:

1. Boot RT-11/FB on the Professional. PRO/TSX-Plus cannot be started under RT-11/XM.

2. Insert the distribution disk into the top RX50 disk drive (DZ0:).

3. Type the following command:

    RUN DZ0:INSTSX

4. The installation process takes several minutes to automatically copy the necessary PRO/TSX-Plus files to your system disk. Should any errors occur during the installation procedure, see the PRO/TSX-Plus Installation Guide.

    Once the installation is complete you may start the execution of PRO/TSX-Plus by typing:

    R TSX

5. PRO/TSX-Plus takes about 15 seconds to get started on the Professional. The console terminal should automatically start. Other terminals may be started as time-sharing lines by typing a carriage return. These include terminals connected to the communications port, the printer port (if properly wired) and ports on the quad serial line unit (quad SLU). Altogether, only five time-sharing lines may be active at any given time. This includes any combination of the console, communications port, printer port, or ports connected to the quad SLU.

6. If you need to restart RT-11, the system must be powered off and back on. The $STOP command is not functional on the Professional.

Once the installation has successfully completed, the distribution disk may be copied for backup purposes. The PRO/TSX-Plus system on the distribution disk (as well as on the system disk) will have been conditioned for the specific Professional computer on which the installation took place. Subsequent execution of the installation procedure may only be done on the system on which the original installation took place.

If your Professional should require repair involving replacement of the mother board, be sure the engineer puts the original ID rom chip into the new mother board.

1. A facility has been added to PRO/TSX-Plus to allow the "F2" function key to cause the current contents of the Professional console screen to be written to the printer. To use this facility the PROPRT program must be running (usually as a detached job) and logical device name "LP:" must be assigned to the printer port.

    PRO/TSX-Plus uses the printer port as a time-sharing line by default. In order to use it for a printer, a CL unit must "take-over" the line.

    A command file (PROPRT.COM) is supplied with the PRO/TSX-Plus distribution to perform the operations necessary to provide the F2/print-screen function. This command file may either be executed as a command file from a primary or virtual line (although not from the primary line attached to the console) or may be used to start a detached job — the normal method. PROPRT.COM contains the following commands:

    ```
    SET CL2 LINE=2      ! Assign CL2 to printer port
    SET CL2 SPEED=4800  ! Set baud rate to 4800
    SET CL2 FORM        ! Printer supports form feeds
    SET CL2 FORM0       ! Form feed at start of file
    ASSIGN CL2 LP       ! Assign LP: to CL2
    R PROPRT            ! Run the PROPRT.SAV program
    ```

    This command file is usually run as a detached job. It may be started as a detached job any time while PRO/TSX-Plus is running. Alternatively, it may be automatically started as a detached job by copying PROPRT.COM to DET2.TSX, which is one of the two start-up detached job command files specified by PRO/TSX-Plus. During installation of PRO/TSX-Plus, an option is presented which can cause PROPRT.COM to be copied to DET2.TSX, resulting in its automatic startup as a detached job. The installation process provides a brief explanation of this feature, then asks the following question:

    Include print-screen detached job [Y/N] ?

    If you intend to use the printer port for a printer, and you want the console F2 key to dump the screen to the printer, then answer Yes. This will cause the file PROPRT.COM to be copied to DET2.TSX, which is automatically started as a detached job whenever PRO/TSX-Plus is started.

    If you intend to use the printer port as a time-sharing line, then you should not start PROPRT.COM as a detached job. To avoid copying PROPRT.COM over DET2.TSX, and thus not automatically starting it as a detached job with PRO/TSX-Plus, answer No to this question.

PRO/TSX-Plus
Installation Manual

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INTRODUCTION

The purpose of this guide is to help you install PRO/TSX-Plus on your Professional system in the quickest and easiest way possible. Read this entire guide before attempting to install or use PRO/TSX-Plus. This guide describes the contents of the distribution kit, necessary system resources, and the procedure for installing a functional version of PRO/TSX-Plus.

This guide is intended for the person installing PRO/TSX-Plus and assumes some familiarity with the commands and utilities of RT-11, including: handling of magnetic media; use of IND control files; and the R[UN] command.

TSX-Plus is a multi-user, multi-tasking operating system which provides the functionality of the RT-11 operating system to multiple users on Digital Equipment Corporation LSI-11 and PDP-11 computers. The PRO/TSX-Plus operating system is designed to provide the TSX-Plus operating environment to multiple users on the Professional computer and embodies the functionality of TSX-Plus, without the ability to perform system generations.

Since PRO/TSX-Plus and TSX-Plus provide the same functionality, the TSX-Plus Reference Manual and the TSX-Plus System Manager's Guide contain information which is common to both systems. However, since PRO/TSX-Plus has preselected generation parameters, the system generation listing (see Appendix A) may be referred to when consulting these manuals to determine which optional features have been included. The TSX-Plus Reference Manual describes the functional differences between RT-11 and TSX-Plus, including additional keyboard commands, unsupported commands, and other minor variations between the two operating systems. The TSX-Plus System Manager's Guide provides detailed information necessary to manage system resources. The TSX-Plus manuals are intended to be used in conjunction with the RT-11 manuals; refer to the RT-11 manuals for descriptions of features which are not discussed in the TSX-Plus Reference Manual.

1. DISTRIBUTION KIT CONTENTS

With each new order of a supported PRO/TSX-Plus operating system, you should receive:

1. Installation guide - this is it.

2. A machine readable RX50 floppy containing the components of the PRO/TSX-Plus operating system.

3. TSX-Plus Reference Manual.

4. TSX-Plus System Manager´s Guide.

2. SYSTEM PREREQUISITES

2.1 Hardware

PRO/TSX-Plus is implemented on the Professional series of computers manu-
factured by Digital Equipment Corporation. PRO/TSX-Plus uses the memory
management hardware and requires at least 512Kb of memory.

At least 2600 unused disk blocks on the system device are required to perform
the full installation procedure. The installation procedure uses the IND
control processor, therefore IND.SAV must be on the system device.

3. INSTALLATION INSTRUCTIONS

Important Note: The PRO/TSX-Plus distribution disk is copy protected, do not attempt to copy it before installing it as this may make it impossible to perform an installation.   It may be copied for backup purposes as you desire, but only after it has been "unlocked" by the installation procedure. Also note that the distribution disk may only be used to install PRO/TSX-Plus on a single computer.   Contact S&H if you require additional distribution disks for other Professional computers.

Perform the following steps to install PRO/TSX-Plus on your Professional:

1. Boot RT-11/FB on the Professional. PRO/TSX-Plus cannot be started under RT-11/XM.

2. Insert the distribution disk into the top RX50 disk drive (DZO:).

3. Type the following command:

   RUN DZO:INSTSX

4. Once the installation is complete you may start the execution of PRO/TSX-Plus by typing:

   R TSX

5. PRO/TSX-Plus takes about 15 seconds to get started on the Professional. The console terminal should automatically start. The communications port and printer port (if properly wired) can be started as time-sharing lines by typing a carriage return.

6. If you need to restart RT-11, the system must be powered off and back on. The $STOP command is not functional on the Professional.

Once the installation has successfully completed, the distribution disk may be copied for backup purposes. The PRO/TSX-Plus system on the distribution disk (as well as on the system disk) will have been conditioned for the specific Professional computer on which the installation took place.

Subsequent execution of the installation procedure may only be done on the system on which the original installation took place.

If your Professional should require repair involving replacement of the mother board, be sure the engineer puts the original ID rom chip into the new mother board.

4. SOFTWARE NOTES

When running on the Professional, the console, the printer port, and the communications port may be used as time-sharing lines. Thus, the Professional may support up to 3 time-sharing users. The printer port and the communications port may also be used as communication lines ("CL" lines) to drive serial peripherals such as printers, plotters, and modems.

A summary of the system characteristics is listed below:

1. The console terminal, printer port, and communications port are generated as time-sharing terminals but may alternatively be used as communications lines. The printer port and communications port are set up to do autobaud speed recognition and will support terminals at 110, 300, 1200, 4800, and 9600 baud. The communications port supports modem control and may be used either hardwired or with dial-up modem control.

2. Support is included for three virtual lines and two detached jobs.

3. Three Communication Line (CL) units are generated into the system but are not initially assigned to any of the terminal lines. CL0 and CL1 are unspooled units. CL2 is a spooled device. The spool file reserves space for 20 files and 250 blocks.

4. The following system features are included:

   a) Support for a 64K byte virtual job region (plus PLAS regions -- see below).

   b) Generalized data caching with 300 blocks in the data cache.

   c) PLAS (Program Logical Address Space) support for up to 250K bytes of total virtual array/overlay extended memory regions.

   d) Shared file record locking, supporting up to 50 shared files and 100 shared file channels.

   e) Message communication with up to 4 queued messages of 200 byte length and 5 message channels.

   f) Support for user defined commands, logical subset disks, the single line editor, program debugging facility, and the SYSMON utility.

   g) Support for 20 I/O channels (zero through 19.) per time-sharing line.

A full listing of the system generation parameters chosen for the pregenerated PRO/TSX-Plus system is provided in Appendix A.

Software Notes

4.1 Start-up and detached command files

Start-up command files are specified for each of the three time-sharing lines.
Two detached command files are included in the system. The names of these
command files are:

```
Line                    Command file
--------------------    ------------
Console terminal        SY:LINE1.TSX
Printer port            SY:LINE2.TSX
Communications port     SY:LINE3.TSX
Detached file           SY:DET1.TSX
Detached file           SY:DET2.TSX
```

If you wish to use the LOGON program to control access to the system, you
should place the following commands in the start-up command file for the line:

```
^(SET ERROR FATAL
R/LOCK LOGON
OFF
```

Other commands, such as turning on the single line editor or assigning LP to a
communications line may be placed in the start-up command file in front of the
"R/LOCK LOGON" command.

4.2 Redirecting the printer port

Communication Line (CL) unit CL2 is generated as a spooled device. The
following commands can be used to direct CL2 to the printer port and set the
speed to 4800 baud which is the default speed for the Professional printer:

```
SET CL2 LINE=2       ! Direct CL2 to printer port (line 2)
SET CL2 SPEED=4800   ! Set speed to 4800 baud
ASSIGN CL2 LP        ! Assign LP to CL2
ASSIGN CL2 LS        ! Assign LS to CL2
```

If the printer port will always be used for a printer, these commands can be
conveniently issued whenever PRO/TSX-Plus is started by including them in one
of the detached command files (e.g., SY:DET1.TSX).

4.3 Redirecting the communication port

Communication units CL0 and CL1 are unspooled communication units. The
following commands can be used to direct CL0 to the communications port and set
it up for use by the VTCOM program:

```
SET CL0 LINE=3        ! Direct CL0 to comm port (line 3)
SET CL0 SPEED=nnnn    ! Select communications speed (usually 300 or 1200)
SET CL0 NOLFOUT       ! Don't transmit line feed chars
ASSIGN CL0 XC         ! Assign logical device used by VTCOM
```

A CL unit may not be assigned to a time-sharing line which is in use. The following commands can be used to disassociate CL units from the lines reenabling them for use as time-sharing lines:

```
SET CL0 LINE=0
SET CL2 LINE=0
```

4.4 Using the printer port as a time-sharing line

If the printer port is used as a time-sharing line, a cable must be constructed to connect it to a terminal. The following pins on the printer port are significant:

Pin	Function
2	Transmit data
3	Receive data
6	Data set ready
7	Signal ground

In addition, pins 8 and 9 must be connected together with a jumper. The data set ready signal on pin 6 must be asserted by the terminal.

4.5 Using the communication port as a time-sharing line

The communications port has a standard DB25 (RS232) connection. Modem support is provided for the communications port.

4.6 Unsupported SETUP commands - SAVE and RESET

The SETUP program may be used under PRO/TSX-Plus to control the operation of the Professional. However, operator privilege is required to run SETUP and the SAVE and RESET functions are not implemented.

WARNING: Do not attempt to use the SAVE function as it may damage the PI.SYS file.

5. INSTALLATION HINTS

Various types of errors can occur and be reported during the installation process. The errors discussed in this section are those most commonly encountered when first installing PRO/TSX-Plus. A complete listing of start-up error messages which may be reported by PRO/TSX-Plus are included in Appendix A of the TSX-Plus System Manager's Guide. Appendix B of the TSX-Plus System Manager's Guide lists those fatal system error messages which may be reported at any time during the operation of PRO/TSX-Plus; these are usually indicative of an unusual hardware condition. If an error is reported during start-up of PRO/TSX-Plus which is not described in those two appendices, it will probably have originated from RT-11 before PRO/TSX-Plus took control; see the RT-11 System Message Manual for descriptions of RT-11 error messages.

?PIP-F-Device full
> There is not enough free space on the system disk to copy all distributed files. The system disk requires about 2600 unused blocks: about 550 blocks for the executable files and handlers, about 1800 blocks for the various swap files, and an additional 250 blocks for the spool file. Remove unnecessary files from the system disk and squeeze if necessary.

?KMON-F-Insufficient memory
> The base of the monitor is too low to load the TSX.SAV program. PRO/TSX-Plus may not be started from the RT-11XM monitor. The TSX.SAV program must be run from the RT-11 Foreground/Background monitor which has NOT been "sysgenned". If necessary, copy the original RT-11 Foreground/Background monitor (RT11FB.SYS) from your RT-11 distribution and boot it before running PRO/TSX-Plus.

?TSX-F-(*** error message displayed here ***)
> See the TSX-Plus System Manager's Guide, Appendix A for descriptions and remedies for fatal errors which occur during start-up of PRO/TSX-Plus.

No response from communication port:
> Check the connections to insure that the wiring is correct and test the port under RT-11. The communication port is generated as a time-sharing line. If you are using the communication port as an I/O device (for example to run VTCOM), see the information in Chapter 4 on redirecting the communication port.

No response from terminals:
> Check the connections to insure that the wiring is correct and test the ports under RT-11. If the hardware is wired and working properly and the installation was performed successfully, the terminal will respond.

No response from printer:

    Check the connections to insure that the wiring is correct and test
the port under RT-11. The printer port is generated as a time-
sharing line. If you are using the printer port for a printer, you
should use the spooled communication line to direct output to this
port. It is necessary to know the speed of the printer which is
connected to this port (the default Professional printer speed is
4800 baud). See the section in Chapter 4 on redirecting the printer
port.

Appendix A - TSGEN PARAMETER LIST

PRO/TSX-Plus has been generated with various system parameters which select the features available. A brief summary of these characteristics is described in Chapter 4. The following listing describes the options chosen and which constitute the PRO/TSX-Plus environment. Since PRO/TSX-Plus is available only as a preconfigured system, no alterations may be made to these choices. Device handlers used in PRO/TSX-Plus are standard RT-11 XM handlers and do not require alteration.

```
;================================================================
;   The TSX-Plus system manager alters values in the following
;   section to customize the system for a particular configuration.
;
;   System parameters:
;
;   Swap file device-file specification.
;
SWDBLK: .RAD50  /SY TSXSWPTSX/
;
;   Spool file device-file specification.
;
SPLBLK: .RAD50  /SY TSXSPLTSX/
;
;   PLAS region swap file specification.
;
RSFBLK: .RAD50  /SY TSXRSFTSX/
;
;   Maximum amount of memory that can be used by any job (# K bytes).
;   This value must not exceed 64. (Kb)
;
HIMEM   =       64.             ;Max memory that any job may use
;
;   Default memory size for jobs that will be in effect when the job
;   logs on. (Specify in # K bytes).
;
DFLMEM  =       64.             ;Default memory limit for jobs
;
;   Number of 512-byte blocks to allocate for swap file that is used
;   for extended memory PLAS (Program's Logical Address Space) regions
;   that are used by jobs that have virtual overlays or virtual arrays.
;   Note that this is the total space in the PLAS swap file for all
;   extended memory regions in use at any time by all jobs.
;   Note: In a non-swapping system (SWAPFL=0), SEGBLK must be non-zero
;   if PLAS support is wanted, but its value does not matter.
;
SEGBLK  =       500.            ;# blocks for PLAS swap file
;
;   SWAPFL controls whether TSX-Plus is allowed to swap jobs to disk if
;   insufficient memory is available to hold all active users.
;   The normal case (SWAPFL=1) allows TSX-Plus to do job swapping.
;   SWAPFL can be set to 0 (zero) in special situations such as when a
;   small number of lines are being supported on a floppy disk based system
```

```
;   that does not have room for a swap file.
;   If SWAPFL is set to zero the following actions occur:
;   1. No disk swap file is created.
;   2. A line will not be allowed to log on if there is insufficient
;      free memory space to support it.
;   3. Each job is allocated a memory size equal to DFLMEM (default job
;      memory size).
;   4. The MEMORY command cannot be used to change the job size.
;
SWAPFL  =       1          ;1==>Allow job swapping; 0==>Do not swap.
;
;   BUSTYP defines the machine bus structure for TSX-Plus.  Their are two
;   possible machine bus structures supported by TSX-Plus - the QBUS (LSI)
;   and the UNIBUS.  Select one of these parameters below to specify the
;   bus support desired.  Use the following information for choosing the
;   correct bus structure.
;
;   QBUS   - 11/23, 11/23-Plus, 11/73, and Professional.
;   UNIBUS - 11/24, 11/34a, 11/44, and 11/60.
;
BUSTYP  =       QBUS              ;Specify machine bus structure (UNIBUS/QBUS)
;
;   Enable 22-bit addressing for the 11/23-Plus, 11/24, 11/44, and 11/73.
;   This feature requires the use of either the 22-bit extended memory
;   mapping for the LSI or the UNIBUS. This feature must be enabled to
;   allow TSX-Plus to utilize more than 256Kb of memory.
;
EXTMCH  =       1          ;1==>Allow 22-bit addressing; 0==>Do not use 22-bit.
;
;   Memory upper limit size specification expressed in number of k-bytes.
;   This parameter controls the maximum memory available for TSX-Plus
;   system use.  Memory above this upper limit will not be used by the
;   operating system.
;   If the MEMSIZ parameter is set to 0 (zero), TSX-Plus will use all
;   available memory on the machine.  To disable the use of extended
;   memory, set MEMSIZ to 248 or less.
;
MEMSIZ  =       0.         ;Upper memory limit
;
;   The INIABT parameter controls the action taken by TSX-Plus when
;   certain errors are detected during system initialization.
;   If INIABT=0, TSX-Plus ignores the error and continues running.
;   If INIABT=1, TSX-Plus aborts initialization and prints an error message.
;
;   ************************************************
;   **   The normal and recommended setting for    **
;   **   this parameter is INIABT=1. It is cleared  **
;   **   for the short-cut installation method.     **
;   ************************************************
;
```

```
;  The following initialization errors are controlled by the INIABT flag:
;     1. A device that was specified in TSGEN is not installed in RT-11
;        or does not have a TSX-Plus handler on the system disk.
;     2. A time sharing line that was generated into TSX-Plus is not
;        installed on the machine.
;     3. A shared run-time system file could not be found during startup.
;
INIABT   =        0           ;0==>Continue on error, 1==>Abort on error
;
;  The  IOABT parameter controls the action taken by TSX-Plus when
;  a job terminates execution.  If IOABT=0, TSX-Plus will wait for
;  all outstanding I/O pending for the job to complete before the job
;  is actually terminated.  If IOABT=1, TSX-Plus will call the handler
;  abort entry point for all outstanding I/O pending for the job.
;  Note, the "SET IO [NO]ABORT" keyboard command may be used to
;  change the value of this parameter.
;
IOABT    =        1           ;0==>I/O rundown, 1==>I/O abort
;
;  U$CL is a flag that controls whether the User Command Linkage is to
;  be used to allow users to define their own commands.
;  If U$CL is non-zero the UCL facility is enabled and users may define
;  their own system commands. If U$CL is zero, user defined commands
;  will not be supported by the system. Note: if the UCL facility is
;  enabled, the TSXUCL.SAV file must be placed on the system disk.
;
U$CL     =        1           ;0==>No UCL program, 1==>UCL program
;
;  Number of user-defined commands that can be stored by TSXUCL
;  for each job. (The number of blocks required in the SY:TSXUCL.DAT file
;  is approximately equal to the number of commands per job times the
;  total number of time-sharing lines divided by 5).
;
UCLMNC   =       20.                    ;Maximum user-defined commands per job
;
;  The UCLORD parameter selects the default call order for checking
;  to see if a command is a user-defined command.
;  FIRST  ==> Check for user-defined commands before system commands.
;  MIDDLE ==> Check after system commands but before command files.
;  LAST   ==> Check after system commands and command files.
;
;  Note that the SET UCL FIRST/LAST keyboard command can be used to
;  alter this order on a line-by-line basis.
;
UCLORD   =       MIDDLE                 ;Select FIRST / MIDDLE / LAST
;
;  The LDSYS flag controls whether the standard system support for
;  logical disks (LD) is to be provided.
;  If LDSYS is set to 1, system support for logical disks is included.
;  If LDSYS is set to 0, system support for logical disks is excluded.
```

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```
;
LDSYS    =    1                ;1==>Include LD support, 0==>Exclude LD.
;
;  The SLEDIT flag controls whether the Single Line Editor (SL) facility
;  is to be made available to the system.
;  If SLEDIT is set to 1, Single Line Editor support is included.
;  If SLEDIT is set to 0, Single Line Editor support is omitted.
;  Single Line Editor support adds approximately 2Kb to the size of the
;  mapped portion of the system.
;
SLEDIT   =    1                ;1==>Include SL support, 0==>Exclude SL
;
;  Set DBGFLG to 1 to cause the TSX-Plus program debugging facility
;  to be included with the system.
;  Set DBGFLG to 0 if the debugging facility is not wanted.
;
DBGFLG   =    1                ;1==>Include debugger; 0==>Exclude debugger
;
;  The following time-slice values are used to schedule jobs for execution.
;  Each time value must be specified in 0.1 second units.
;
;  QUAN0 -- Time slice for round-robin scheduling of high-priority
;           real-time jobs. That is, jobs with execution priorities
;           greater than or equal to PRIHI.
;
QUAN0    =    2.               ;Time slice for real-time jobs
;
;  QUAN1 -- Time that jobs will remain in a high-priority state after
;           they receive an activation character from the terminal.
;           A job is classified as "interactive" from the time when an
;           activation character is received until the job consumes
;           QUAN1 units of time, then the job is classified as "compute
;           bound".
;
QUAN1    =    20.              ;High-priority time for interactive jobs
;
;  QUAN1A -- Time that jobs will remain in a high-priority state after
;            they are activated because of I/O completion or they are
;            restarted following other wait states.
;
QUAN1A   =    2.               ;High-priority time for wait-reactivation
;
;  QUAN1B -- Time slice used to switch between "interactive" jobs.
;
QUAN1B   =    2.               ;Time slice for "interactive" jobs.
;
;  QUAN1C -- Time job will be allowed to stay in highest execution state
;            after receipt of a character from the terminal.
;
QUAN1C   =    1.               ;Time at highest execution state
```

```
;
;   QUAN2 -- Time that normal priority CPU-bound jobs are allowed to run
;             if there are no high-priority jobs that want to run.
;             This time-slice controls round-robin scheduling of CPU-bound jobs
;             with execution priority values in the range (PRILOW+1) to
;             (PRIHI-1).
;
QUAN2   =       10.              ;Normal-priority CPU-bound job time-slice
;
;   QUAN3  -- Time slice for round-robin scheduling of very low priority
;             jobs. That is, jobs with priorities less than or equal
;             to PRILOW.
;
QUAN3   =       20.              ;Time slice for very low priority jobs
;
;   INTIOC -- Number of consecutive times that a job will be allowed to
;             perform I/O operations following input of an activation
;             character from the terminal before the job is classified
;             as non-interactive.
;
INTIOC  =       30.              ;Number of I/O ops. while "interactive".
;
;   HIPRCT -- Number of consecutive times that a job will be given a
;             high-priority execution boost following wait states such
;             as I/O wait before the job will be scheduled as a normal
;             CPU-bound job.
;
HIPRCT  =       40.              ;Number of consecutive high-priority hits
;
;   Time that job will be held in memory after being swapped in from disk.
;   A job is not eligible to be swapped out of memory until CORTIM has
;   elapsed since it was swapped into memory.  However, the job becomes
;   immediately eligible to be swapped if it goes into a state where it is
;   waiting on any resource other than non-terminal I/O.
;   Specify in 0.1 second units.
;
CORTIM  =       2.               ;Guaranteed memory-residency time
;
;   Job priority classes:  There are three groups of job priorities,
;   the lowest priority group ranges from a job priority 0 up to and
;   including the priority equal to the PRILOW parameter. Jobs with
;   priorities in this range execute with lower priority than all normal
;   time-sharing jobs.
;   The second range of priorities is from (PRILOW+1) up to (PRIHI-1).
;   Jobs in this range are treated as normal time-sharing jobs.
;   The third range of priorities is from PRIHI up to 127. These priorities
;   are for real-time jobs which will take unconditional precedence over
;   all other jobs.
;   All priority values must be in the range 0 to 127.
;
```

```
PRILOW  =       19.             ;Highest "low priority" value
PRIHI   =       80.             ;Lowest "high priority" value
;
;  PRIDEF -- Default job priority.
;
PRIDEF  =       50.             ;Default job priority
;
;  PRIVIR -- Amount by which a job's execution priority is reduced
;            when the job is disconnected from the terminal by switching
;            to a virtual line. Note: this only applies to jobs with
;            base priorities in the range (PRILOW+1) to (PRIHI-1).
;
PRIVIR  =       10.             ;Disconnect job priority reduction
;
;  Maximum number of virtual lines per primary line.
;
MAXSEC  =       3.              ;Max virtual lines per user
;
;  Maximum file size (# blocks) that will be returned in response to
;  a .ENTER request that specifies a file size of 0 blocks.
;
MAXFIL  =       1000.           ;Max # blocks for default allocation
;
;  Number of 512 byte blocks to hold in memory in a generalized data cache.
;  If the CACHE parameter is set to 0 (zero), data caching is not performed.
;  Note: The data caching facility adds approximately 2000 bytes to the
;  size of the unmapped portion of the system and 528*CACHE bytes to
;  the mapped portion of the system.
;
CACHE   =       300.            ;Number of blocks in data cache
;
;  The following parameters relate to the cache of file directory entries
;  maintained by TSX-Plus.  This cache is used to reduce the number of disk
;  accesses required to do lookups on frequently accessed files.
;  The system disk (SY:) is automatically cached.
;  Other devices are only cached if they are introduced to the system
;  by use of the MOUNT command.
;
;  Maximum number of units that may be cached.
;  This includes all logical disks (LD) and all physical disks for which
;  directory caching is enabled by use of the MOUNT command.
;  (Space required is 14 bytes per unit).
;
MAXCSH  =       30.             ;Max # device units whose directories to cache
;
;  Maximum number of file entries to be held in directory cache.
;  (Space required is 18 bytes per entry)
;
NMFCSH  =       60.             ;Max # file entries to be cached
;
```

```
;  Maximum number of device units that can be allocated to jobs for exclusive
;  use by use of the ALLOCATE command.
;
MAXALC  =        5.                    ;Max # units that can be allocated
;
;  Maximum number of simultaneous requests by jobs to monitor other jobs.
;
MAXMON  =        5.                    ;Max # job monitoring requests
;
;  Amount of time that carrier signal must be lost on dial-up
;  lines before we assume the connection has been broken.
;  This value is also used to time-out lines which ring and
;  do not raise carrier.
;  Specify in 0.5 second units.
;
TIMOUT  =        120.                  ;Allow 60 seconds of lost carrier.
;
;  Amount of time that a user may remain connected to a dial-up line
;  after logging off before Data Terminal Ready (DTR) will be
;  dropped causing the phone to hang up.
;  Specify in 0.5 second units.
;
OFFTIM  =        60.                   ;Time allowed for job to be logged off
;
;  Define Lead-in character that tells TSX-Plus that a special
;  terminal control sequence is coming from the program.
;
TSLICH  =        35                    ;Octal 35 = decimal 29.
;
;  Define the keyboard control character that will be used to
;  switch between virtual time-sharing lines.
;  (Specify the octal value of the ASCII control character)
;
VLSWCH  =        27                    ;Octal 27 = control-W
;
;  Define maximum number of user defined activation characters
;  that each line may define during execution.
;
MXSPAC  =        16.                   ;Max # user defined activation chars per job
;
;  Select default system editor.
;  The choices are
;    EDIT
;    TECO
;    KED
;    K52
;
EDITOR  =        KED                   ;Default system editor
;
;  Select system default implicit or explicit wildcards for CCL commands.
```

```
            DEVDEF   <DW>
            DEVDEF   <DZ>
            DEVDEF   <NL>
            DEVDEF   <ZZ>,MAPH
            DEVEND                   ;End of device definitions
```

```
;--------------------------------------------------------------------
;  Parameters related to system I/O buffers used when DMA devices
;  with 18-bit controllers are used on Q-bus systems with
;  22-bit addressing (e.g., 11/23-Plus and 11/73).
;
;  Number of system buffers allocated for I/O buffering.
;  (The recommended number is one per active device that requires buffering.)
;
MIONBF  =       0.                   ;Number of system I/O buffers
;
;  Size of each system I/O buffer, in units of 512 bytes.
;  The maximum allowed value for this parameter is 15.
;
MIOBSZ  =       8.                   ;I/O buffer size in units of 512 bytes
```

```
;--------------------------------------------------------------------
;  Define those devices which are to be spooled by TSX-Plus
;  (such as line printers).
;  There are seven arguments to the SPOOL macro:
;     1. Number of devices to be spooled (may be zero).
;     2. Number of spool files which may be open by all users.
;     3. Number of spool buffers (512. bytes each).
;     4. Number of blocks in spool disk file.
;     5. List of 3 character names of devices to be spooled.
;     6. Specify 0 if spool files are to be eligible to be
;        started as soon as they are created,
;        specify 1 if they are to be held until the channel
;        is closed.  Note: The "SPOOL xx,[NO]HOLD" keyboard
;        command can override this parameter.
;     7. Number of blocks which are to be backed up
;        when the "SPOOL xx,BACK" command is given.
;
;  Note: The SPOOL macro must be present even if
;  there are no spooled devices.  However, if the first
;  argument (number of spooled devices) is zero, no spool
;  tables are generated and arguments 2-7 are ignored.
;
            SPOOL   1,20.,2,250.,<CL2>,0,5.
```

```
;--------------------------------------------------------------------
;  Define parameters pertaining to record (block) locking
;  for shared files.  If the shared file block locking
;  facility is not wanted, set all of these parameters to
;  0 (zero).
```

```
;
;   Maximum number of shared files which may be open
;   simultaneously.  Note that several users accessing the same
;   file count as 1.
;
MAXSF    =        50.                ;Max number of shared files
;
;   Maximum number of I/O channels which all users may
;   simultaneously have open to shared files.
;   Note, this is the total number for all users not
;   for each user.
;
MAXSFC   =       100.                ;Max # shared file channels
;
;   Maximum number of blocks which may be simultaneously
;   held locked by any channel.  That is, max blocks
;   locked per channel.
;
MXLBLK   =         5.                ;Max blocks locked per channel
;
;   Number of 512-byte blocks to be held in the in-memory data
;   cache for shared files.
;   (Note that the MAXSF, MAXSFC, and MXLBLK parameters must be
;   non-zero to enable shared file data caching.)
;
NUMDC    =         0.                ;Number of blocks in shared file data cache
;
;-------------------------------------------------------------------
;   Define parameters pertaining to the inter-program
;   message communication feature.  If this feature is
;   not wanted, set all four parameters to 0 (zero).
;
;   Maximum number of message communication channels
;   which may be simultaneously in use.
;
MAXMC    =         5.                ;Max message channels
;
;   Maximum message length (bytes).
;
MSCHRS   =       200.                ;Max message length (bytes)
;
;   Maximum number of messages which may be held in queue.
;
MAXMSG   =         6.                ;Max queued messages
;
;   Maximum number of requests for messages that may be held in queue
;
MAXMRB   =         5.                ;Max # pending message requests

;-------------------------------------------------------------------
;
```

```
;  The RTVECT parameter is used to control whether the TSX-Plus
;  real-time support facility is to be included in the system being
;  generated.  If RTVECT is set to 0 (zero) the real-time support facility
;  is not included in the system being generated.  If RTVECT is greater
;  than zero, the real-time support facility is included.
;  Set RTVECT to the maximum number of interrupt vectors that all running
;  real-time programs may be connected to at the same time.
;  Note: The RTVECT parameter must be non-zero if the SYSMON system monitor
;  and display program is going to be used.
;
RTVECT  =       1.                      ;Max # interrupt vectors that may be connected


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


;------------------------------------------------------------------------
;  Use the RTDEF macro at this point to specify information about
;  any shared run-time systems to be loaded when TSX-Plus is started.
;
;  The form of the RTDEF macro is
;       RTDEF   <name>,r-flag,skip-count
;
;  Where
; - Name is the 12 character name of the file containing the run-time system
;   which must be specified in the form DevFilnamExt -- that is, three
;   character device name, six character file name and three character
;   extension.
; - R-flag is either R if user programs are to have read-only access to
;   the run-time system, or RW if read-write access is to be granted.
; - Skip-count is the number of blocks to be skipped over at the front
;   of the file when loading it.
;
;  Example:
;       RTDEF   <SY CBRO50SHR>,R,1.     ;COBOL-Plus shared run-time
;       RTDEF   <SY DBLSHRRTS>,R,1.     ;DBL shared run-time
;
;------------------------------------------------------------------------
;  Time-sharing line parameters:
;
;  Default input and output character buffer sizes.
;  These buffer sizes will be used for lines that don't use
;  the BUFSIZ macro within their line definitions to declare
;  their character buffer sizes.
;  These buffer sizes are also used for all virtual lines.
```

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```
;
DINSPC   =        190.             ;Default input char buffer size
DOTSPC   =        240.             ;Default output char buffer size
;
;   When the terminal-output character buffer is filled a job is suspended.
;   The job is restarted after characters are printed from the buffer and
;   there are OTRASZ characters remaining in the buffer.
;
OTRASZ   =        25.              ;Reactivation character count
;
;   A software character "silo" is used to hold characters received
;   from time-sharing lines until they can be processed by the system.
;   The silo is used to prevent the loss of characters during high
;   speed input.  Each time-sharing line and CL line has its own silo.
;   If the input to the line is coming from a terminal, the silo can be
;   quite small.  On the other hand, if the input is coming from another
;   computer or other high speed device, the silo size should be increased.
;   The NCSILO, NCXOFF, and NCXON parameters set default values pertaining
;   to the silos.  The SILO macro can be used within a line definition
;   to specify silo parameters for a specific line.
;
;   Default size of input character silos.
;
NCSILO   =        44.              ;Default silo size
;
;   The system will transmit a control-S (XOFF) character when an input
;   silo is filled to the point where there are only NCXOFF free
;   character positions remaining.
;
NCXOFF   =        12.              ;Default XOFF point for silos
;
;   If the system sends an XOFF because a silo becomes nearly full,
;   it will send an XON to restart transmission when there are only
;   NCXON characters remaining in the silo.
;
NCXON    =        4.               ;Default XON point for silos
;
;   Number of "extra" CL (communication line) units to be genned into
;   system.  These CL units are not initially assigned to any line but
;   may be used "take over" a time-sharing line to use it as a CL unit.
;   The total number of CL units (those defined using CLDEF blocks plus
;   the extra units) may not exceed 8.
;
CLXTRA   =        3.               ;Number of extra CL units.
;
;   Default output ring buffer size for I/O communication lines defined
;   with the CLDEF macro and accessed as "CL" devices.
;   The recommended value is ((3*baud_rate)/1000+2).
;
CLORSZ   =        32.              ;Size of CL output ring buffers
```

```
;
;----------------------------------------------------------------------------
;   Flags which can be used with the FLAGS macro within
;   a line definition block to define line characteristics.
;
$SCOPE   =       100000   ;ON==>CRT type terminal
$ECHO    =       40000    ;ON==>Echo characters to terminal
$TAPE    =       20000    ;ON==>"Paper-tape" mode (do x-on/x-off control, etc.)
$8BIT    =       10000    ;ON==>Support 8 bit (rather than 7 bit) characters.
$START   =       4000     ;ON==>Automatically start line during initialization
$NODET   =       2000     ;ON==>Disallow use of detached jobs
$TAB     =       1000     ;ON==>Do not simulate tabs (Terminal handles tab char)
$FORM    =       400      ;ON==>Do not simulate form-feeds (Terminal handles FF)
$AUTO    =       200      ;ON==>Do autobaud speed selection for line
$LC      =       40       ;ON==>Enable lower-case input
$NOVLN   =       20       ;ON==>Disallow use of virtual lines
$DEFER   =       10       ;ON==>Do defered character echoing (recommended)
$QTSET   =       4        ;ON==>Set tt quiet (Don't list command files)
$PRIV    =       2        ;ON==>Allow job to use privileged system features
$PHONE   =       1        ;ON==>Dial-up, modem connected line
;
;   Default line flags that will be used for each line that does
;   not explicitly specify flags using a FLAGS macro.
;
NRMFLG   =       $ECHO!$DEFER!$LC!$PRIV
;
;----------------------------------------------------------------------------
;   Terminal type names that are legal to used with the TRMTYP macro
;   within a line definition block to define the terminal type.
;
;   VT100  ==> DEC VT100
;   VT200  ==> DEC VT200 with 7 bit control codes
;   VT52   ==> DEC VT52
;   LA36   ==> DEC LA36
;   LA120  ==> DEC LA120
;   HAZEL  ==> Hazeltine brand terminals
;   ADM3A  ==> Lear Siegler ADM3A
;   DIABLO ==> Diablo brand terminals (with X-ON/X-OFF protocol)
;   QUME   ==> Qume brand terminals (with X-ON/X-OFF protocol)
;
        .PAGE
;----------------------------------------------------------------------------
;   Line definitions
;
;   The TBLDEF macro call requires four arguments:
;       1. The number of real (physical) time-sharing lines on machine.
;       2. The number of virtual time-sharing lines desired.
;       3. The number of detached job lines to be generated.
;       4. The number of dedicated CL lines.
;
```

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```
        TBLDEF  3.,3.,2.,0.        ;# Real, # Virtual, # Detached, # CL lines
;
;   Define primary (real) time-sharing lines
;
        LINDEF  60,177560,OPER   ;Use console terminal as t/s term
        CMDFIL  LINE1.TSX
        TRMTYP  VT100
        FLAGS   NRMFLG!$PRIV!$START!$SCOPE!$TAB
        LINEND

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

        LINDEF  210,173300        ;Communications port
        FLAGS   NRMFLG!$AUTO!$PHONE
        CMDFIL  LINE3.TSX
        TRMTYP  VT100
        LINEND
;
;;
;   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
;
;==========================================================
;   END OF SECTION OF TSGEN TO BE ALTERED BY USER
;==========================================================
```