RSTS/E
System Generation Manual

Order No. AA–2669G–TC

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This manual describes the installation procedures for the RSTS/E V8.0 system.

OPERATING SYSTEM AND VERSION:	RSTS/E	V8.0
SOFTWARE VERSION:	RSTS/E	V8.0

digital equipment corporation, maynard, massachusetts

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Preface

This manual provides a task-oriented procedure for RSTS/E system generation.

The audience for this book is anyone installing RSTS/E, and includes:

- Original Equipment Manufacturers (OEMs)
- End-Users
- DIGITAL Field Service Representatives

Because this audience ranges widely in levels of experience and knowledge, the manual cannot assume a great deal of experience. Thus, the manual directs itself to those who are less experienced and knowledgeable about performing a system generation.

Related Documents

You should have the following documents available while performing a system generation:

- *RSTS/E V8.0 Release Notes*
- *RSTS/E System Manager's Guide*
- *RSTS/E Programming Manual*
- *RSTS/E Maintenance Notebook*
- *RSTS/E Software Dispatch*

Conventions

The following symbols and conventions are used in this manual:

LF	Indicates pressing the LINE FEED key.
RET	Indicates pressing the RETURN key.
ESC	Indicates pressing the ESCAPE key (shown as ALT MODE on some terminals).
Italics	Indicates that a definition follows the italicized technical term.
CTRL/x	Indicates pressing the CTRL key and some letter, usually C or Z (CTRL/C, CTRL/Z).
`Dot matrix`	Indicates text displayed on the console terminal.
`Color`	Red dot matrix indicates the response made in the example installation. Your response may differ from the response given in the example installation.
	Tells what task or phase you should perform next.

Summary of Technical Changes

The following is a summary of changes to this manual for RSTS/E V8.0:

- The manual is rewritten and reorganized. Please read the preface and introduction so that you understand how to use the manual. DIGITAL is interested in your viewpoints; please use the Reader's Comment Form for communicating your comments, criticisms, and ideas.
- The new RSTS/E distribution kit part numbers, the DECnet/E and RJ2780 optional software kit part numbers, and the RSTS/E update kit part numbers are now in Chapter 3.0 of the *RSTS/E Release Notes*.
- Bootstrap instructions for the different PDP–11 hardware bootstrap loaders are now in Appendix E.
- The RS03/RS04 (DS) and RF11 (DF) disks can not be used as system disks.
- DSKINT has several new questions. In addition, the pattern checks have been improved, and DIGITAL now recommends you use the three new pattern checks in checking for bad blocks.
- Information on the PATCH option has been removed from the manual. The *RSTS/E Release Notes* or a DIGITAL software support representative will supply the instructions for applying any necessary manual patches.
- The configuration questions have changes and additions to reflect additional hardware support. This hardware includes: the RM80, RA60, RA80, RA81, RC25, RD51, and RX50 disk drives; the TSV05 and TU80 magnetic tape drives. There is also a question on EMT logging.
- References to the BP2COM run-time system have been deleted.
- BUILD has additional dialogue questions to accommodate the removal of the MFD from account [1,1] and the prebuilt system programs. In addition, there are two questions that allow you to choose which spooling package you want, either the micro RSTS spooling package or the standard RSTS/E spooling package.
- The UNISYS and FILL HARDWR suboptions are no longer available and, therefore, have been deleted from the manual. The LOAD suboption has also been deleted from the manual; support for this option will cease in the next release.
- The LP suboption of SET has settings to accommodate 8–bit and no 8–bit characters. The RESET suboption of SET allows you to reset the line printer settings to the defaults established by DIGITAL.

Introduction to System Generation

This chapter explains:

- Some basic concepts about system generation
- The tools DIGITAL provides for performing system generation
- How to use this manual
- The structure of this manual

What Is System Generation?

System generation is the process by which you build:

- A RSTS/E monitor
- One or more run-time systems
- System programs
- Bundled software
- Optional software

The following sections briefly explain each of these items.

RSTS/E Monitor

The *RSTS/E monitor* is a set of routines that controls:

- System scheduling – RSTS/E stands for Resource Sharing Time Sharing/ Extended. This means the monitor makes sure that all users can work simultaneously without interruption or interference, for example: running programs, creating programs, accessing data files, or working with a text editor.
- Memory management – The monitor makes sure that computer memory is used efficiently.
- Input/output services – The monitor handles requests to and from input/output devices.

- Device management – Your installation probably has a variety of hardware, such as tape drives, line printers, and disk drives. The monitor controls the software that transfers data between these hardware devices and computer memory.

- System program management – A *system program* is software that provides you with a set of tools for performing common tasks, such as copying or deleting files. PIP, SYSTAT, and QUEMAN are examples of system programs. The monitor keeps track of who is using these system programs.

DIGITAL sells RSTS/E to a diverse audience; therefore, each installation requires a monitor suited to its needs. During system generation, you build a RSTS/E monitor that reflects the hardware you have (number and types of tape drives, disk drives, and other peripheral devices), and the software you choose (number of jobs, number of small buffers, resident libraries, and so forth).

To get you started, DIGITAL supplies a temporary RSTS/E monitor (called the SYSGEN monitor) on the distribution tape or disk. This monitor is prebuilt and requires only minor tailoring during system generation. You use it to build your RSTS/E monitor. After you build your RSTS/E monitor, you do not need the SYSGEN monitor anymore. You will be instructed when to "shut it down."

Run-Time Systems

A *run-time system* is software that provides an environment for either people or programs to work in. Some run-time systems provide an environment for both.

The run-time systems that DIGITAL supplies with RSTS/E are:

- BASIC–PLUS
- RSX
- DCL
- RT11

System generation requires that you build not only a monitor, but also one or more of these run-time systems. You must also indicate which one of these run-time systems will be your *primary run-time system*, the one that controls system startup and shutdown. Any additional run-time systems you build are called *auxiliary run-time systems*.

System Programs

System programs provide you with tools for performing common tasks. For example, system programs allow you to efficiently develop programs, manage files, and perform special system management-related tasks. These system programs run under the control of a run-time system.

DIGITAL distributes RSTS/E system programs (as well as bundled and optional software) on *control files*, located on the distribution tapes or disks. You process these control files during system generation to build the system programs your installation needs. The only control file you must process is BUILD.CTL, which builds such system programs as REACT, MONEY, PIP, and SWITCH.

Bundled Software

Bundled Software is software distributed by DIGITAL, at no additional cost to you. You are not required to build any bundled software. Examples of bundled software are EDT, RMS–11, and SORT.

Optional Software

Optional software is software that you must purchase from DIGITAL. You can build optional software during system generation by processing the appropriate control file. Examples of optional software are DECnet/E, BASIC–PLUS–2, COBOL–81, and DIBOL.

Types of System Generation

This manual describes three types of system generations:

- System generation to build a new RSTS/E monitor – in this type of system generation you build a RSTS/E monitor, one or more run-time systems, the required system programs, and — optionally — any other system programs and bundled and optional software.
- System generation to upgrade a RSTS/E monitor – in this type of system generation you upgrade a V7.2 or earlier version of the monitor to a V8.0 monitor. This system generation is almost identical to the previous one, with some additonal tasks.
- Online system generation – in this type of system generation you build RSTS/E monitors and/or BASIC–PLUS run-time systems during timesharing on a previously generated version 8.0 system. Note that you cannot perform an online system generation to generate a version 8.0 system from a version 7.2 or earlier system.

Another kind of system generation is:

- System generation to build a monitor for another PDP–11 – in this type of system generation you build a RSTS/E monitor and run-time systems on this PDP–11 for use on another PDP–11. This means you must know the hardware characteristics of the PDP–11 for which you are building the monitor and run-time systems.

System Generation Tools

DIGITAL supplies all of the tools you need to perform a system generation. These tools include:

- INIT.SYS – Provides options for initializing system and nonsystem disks, copying required files to the system disk, tailoring the RSTS/E and SYSGEN monitors, installing the RSTS/E and SYSGEN monitors, and so forth. INIT.SYS displays the Option: prompt on the console terminal.
- SYSGEN.SIL – Contains the SYSGEN monitor, which is the monitor DIGITAL supplies to help you build your RSTS/E monitor.
- CREATE.SAV – Copies the files needed to do a system generation.
- SYSGEN.SAV – Asks the questions that allow you to decide what hardware and software your RSTS/E monitor will support.
- SYSBAT.SAV – Builds the monitor and BASIC–PLUS run-time system.
- BUILD – Builds the RSX and DCL run-time systems, system programs, and any bundled and optional software (not to be confused with the BUILD.CTL control file).

How to Use This Manual

The *RSTS/E System Generation Manual* focuses on the tasks you must perform to generate your monitor, rather than the option or program used to complete the task. Part One of the manual tells how to build a new RSTS/E monitor. It is divided into twelve phases, each consisting of one or more tasks. This logical division of phases makes it easier to understand the complex process of system generation. Part Two of the manual explains how to perform a system generation to upgrade an existing RSTS/E monitor. Part Three of the manual explains how to perform an online system generation.

Some tasks require you to load and unload tapes or disks, depending on the RSTS/E distribution kit you received. Other tasks require you to answer questions and to make decisions about some of the questions you need to answer.

The method of explanation depends on the type of task you perform. In tasks requiring you to load a tape or disk, the manual gives you general load instructions.

In tasks requiring you to answer questions and make decisions about the answers to those questions, the manual first gives you any necessary background information, followed by a terminal session. Each terminal session explains the question and gives some possible responses. The responses in red next to the question are those from an example installation. Use the example installation as a guide when you are building your RSTS/E monitor.

This example installation has the following characteristics:

- CPU: PDP–11/34
- Memory: 124K words
- System Disk: RK06
- Nonsystem Disk: RK06
- RSTS/E Distribution Kit: 1600 bpi magnetic tape
- Primary Run-Time System: RSX
- Auxiliary Run-Time Systems: BASIC–PLUS, DCL, RT11

Your responses may differ from the ones you see in the example installation. For example, the following is from a Phase 2, Task 2 terminal session:

```
DD-MMM-YY? 15-DEC-82
```

Explanation — This question asks for the current date.

Response — Type the current date in either of two formats: the alphabetic format (for example, 15–DEC–82), or the numeric format (for example, 82.12.15). In the example installation, the response is in the alphabetic format.

In addition to the explanation in the manual, you also have access to online explanations. To print the online explanations on your console terminal, press RETURN after a question. In this case, you press RETURN after the DD–MMM–YY? question to print the online explanation.

System Generation Flowchart

Figure 1, the System Generation Flowchart, summarizes how to build a new RSTS/E monitor. You may want to use this flowchart while you perform system generation.

Structure of This Manual

This manual divides system generation into twelve phases, where each phase consists of one or more tasks. The manual also includes conditional tasks, which you perform according to the needs of your installation.

For convenience, the option or program you use in a task (such as DSKINT or COPY) appears in parentheses next to the listed tasks, which appear at the start of each phase or conditional task. The contents of each phase and conditional task are as follows.

Phase 1: Getting Started

Phase 1 provides instructions on collecting the required distribution kits and documentation, checking the distribution kit order numbers, and physically mounting and bootstrapping either the distribution tape or disk.

Bootstrap instructions are in Appendix E; however, Phase 1 contains an example of bootstrapping.

Phase 2: Disk Preparation

Phase 2 describes how to mount, initialize, and copy files to your system disk. This phase also explains how to mount and initialize a nonsystem disk. In addition to disk preparation, this phase explains how to create system files on the system and nonsystem disks.

Phase 3: Tailor SYSGEN Monitor

Phase 3 explains how to install and establish defaults for the SYSGEN monitor.

Phase 4: Configure RSTS/E Monitor, Part 1

Phase 4 explains how to start the SYSGEN monitor, run the CREATE.SAV program, and answer the configuration questions. These configuration questions let you specify what hardware and software your RSTS/E monitor will support. In addition, this phase asks questions about the BASIC–PLUS run-time system that you must answer if you want to include it.

Phase 5: Configure RSTS/E Monitor, Part 2

Phase 5 describes how to run the SYSBAT.SAV program.

Phase 6: Shut Down SYSGEN Monitor

Phase 6 tells how to shut down the SYSGEN monitor.

Phase 7: Tailor RSTS/E Monitor

Phase 7 explains how to install the RSTS/E monitor, establish RSTS/E monitor defaults, list the file status table, and start the RSTS/E monitor.

Phase 8: Build/Patch RSX, System Programs, and Bundled Software

Phase 8 tells how to mount the update tape or disk, copy patches to the system disk, build/patch RSX as a primary and auxiliary run-time system, build/patch system programs, build/patch the DCL run-time system, and build/patch bundled software.

Phase 9: Tailor System Files

Phase 9 describes how to tailor the NOTICE.TXT, HELP.TXT, START.CTL, and CRASH.CTL files.

Phase 10: Prepare for Timesharing

Phase 10 explains how to create user accounts and shut down the system.

Phase 11: Create Backup of RSTS/E Monitor Disk

Phase 11 describes how to back up the monitor to disk or tape using SAVRES.

Phase 12: Timesharing

Phase 12 tells how to start timesharing.

In addition to these phases, there are conditional tasks, which are tasks you perform according to the needs of your installation.

Hardware-Related Tasks

These tasks explain how to define characteristics for the hardware supported by your monitor. These tasks are associated with the HARDWR option of INIT.SYS.

Device-Related Tasks

These tasks tell how to specify characteristics for device units supported by your monitor. These tasks are associated with the SET option of INIT.SYS.

Memory Allocation-Related Tasks

These tasks describe how to manipulate the memory allocation table. They are associated with the memory allocation table suboptions, which you can access through the DEFAULT or START options of INIT.SYS.

File-Related Tasks

These tasks explain how to manipulate the files that reside in account [0,1]. They are associated with the REFRESH option of INIT.SYS.

Bootstrap-Related Task

This task tells how to bootstrap magnetic tapes and disks by using the BOOT option of INIT.SYS.

In addition, the manual contains:

Part Two: Performing a System Generation to Upgrade a RSTS/E Monitor

This part of the manual contains a list of steps you need to perform in order to upgrade a V7.2 or earlier monitor to V8.0.

Part Three: Performing an Online System Generation

This part of the manual contains a list of steps you need to perform if you want to build additional V8.0 monitors and/or BASIC–PLUS run-time systems.

The manual also provides you with six appendixes:

Appendix A: System Generation Error Messages

This appendix lists errors that may occur during system generation.

Appendix B: Device Testing Package (DEVTST)

This appendix contains instructions on how to use the *Device Testing Package*, a set of programs that verify the reliability of RSTS/E supported hardware.

Appendix C: Address and Vector Assignments

This appendix present the algorithms for assignment of floating addresses and vectors. It also lists the fixed assignments for devices supported by the RSTS/E monitor.

Appendix D: RSTS/E System Library Control Files

This appendix lists and defines the programs and files associated with the seven system control files distributed on the RSTS/E distribution kits.

Appendix E: Bootstrapping the Distribution Medium

This appendix contains bootstrap instructions for the different types of hardware bootstrap loaders you might have on your PDP–11.

Appendix F: System Generation Example

This appendix contains a sample system generation.

Phase 1 Getting Started

This phase describes the tasks you must perform before beginning system generation:

- Task 1: Collect Distribution Kits and Documentation
- Task 2: Check Order Numbers of Distribution Kits
- Task 3A: Physically Mount and Bootstrap Distribution Tape
- Task 3B: Physically Mount and Bootstrap Distribution Disk

Perform Task 3A only if your distribution kits consist of tapes.

Perform Task 3B only if your distribution kits consist of disks.

Task 1: Collect Distribution Kits and Documentation

DIGITAL sends you one of the following distribution kits:

- *A Kit* – for new RSTS/E customers. Contains complete RSTS/E documentation, RSTS/E distribution kit, RSTS/E update kit, and all purchased optional software kits.
- *H Kit* – for those whose service contract or warranty has expired or for those who have purchased additional CPUs. Contains complete RSTS/E documentation, RSTS/E distribution kit, RSTS/E update kit, and all purchased optional software kits.
- *W Kit* – for those under warranty or software product service contract. Contains changes or additions to the RSTS/E documentation, RSTS/E distribution kit, RSTS/E update kit, and all purchased optional software kits (only if the original version has changed).

To perform a system generation, collect the following items from the A, H, or W kit:

- *RSTS/E Release Notes* – explains the differences between the most current and previous version of RSTS/E. You refer to this document frequently during system generation. (Use the *RSTS/E V8.0 Release Notes.*)
- *RSTS/E System Manager's Guide* – describes how to operate and manage a RSTS/E system. You refer to this manual for more detailed information on some of the tasks performed during system generation. You also use this manual to help you manage your system on a day-to-day basis.

- *RSTS/E Programming Manual* – describes RSTS/E programming techniques. You refer to this manual for additional information about the software tuning and features configuration questions (explained in Phase 4).
- *RSTS/E Maintenance Notebook* – contains optional feature patches and replacement modules for RSTS/E. All patches and replacement modules in this notebook are on the RSTS/E update kit. Usually you do not need this notebook during system generation.
- *RSTS/E Software Dispatch* – contains new and revised software product descriptions (SPD), programming notes, patches and replacement modules for optional and bundled software, and documentation corrections. Usually you do not need to use this book during system generation.
- *RSTS/E Distribution Kit* – consists of the tapes or disks that contain the programs and files you need to perform a system generation.
- *RSTS/E Update Kit*– consists of the tape(s) or disk(s) that contain feature and mandatory patches and replacement modules. You receive this kit approximately every three months between releases, and the kits are labeled A, B, C, and so forth. Because each kit is cumulative, use the most current one. For example, Update Kit C contains all of the patches and replacement modules that were on Update Kits A and B, plus some new patches and replacement modules.
- *Optional Software Kit(s)* – optional software is purchased separately from the RSTS/E distribution kit. Examples of optional software are COBOL–81, BASIC–PLUS–2, and DIBOL. You purchase optional software from an original equipment manufacturer or directly from DIGITAL. Each optional software kit consists of the disk or tape that contains the programs and files you need to install the optional software, along with the appropriate documentation and installation guide.

If one or more of these items is missing, contact your DIGITAL software support specialist.

Go to Task 2.

Task 2: Check Distribution Kit Order Numbers

Check the order numbers that appear on the tapes or disks that make up your RSTS/E distribution kit and RSTS/E update kit to be sure they match the order numbers that appear in Chapter 3 of the *RSTS/E Release Notes*. The *RSTS/E Release Notes* also contains the order numbers for the DECnet/E Software Kit and the RJ2780 Software Kit. To check the order numbers of any other optional software kits, refer to the bill of materials.

☞ Go to task 3A if your distribution kit consists of tapes.

☞ Go to task 3B if your distribution kit consists of disks.

Task 3A: Physically Mount and Bootstrap Distribution Tape

This task requires you to mount and bootstrap the appropriate tape from your RSTS/E distribution kit. First, the task provides instructions for mounting the tape on a tape drive. Second, the task provides an example of bootstrapping this tape. In the example installation, the RSTS/E distribution kit consists of a 9–track 1600 bits per inch (bpi) tape.

Tape Mount Session

Mount the 800 or 1600 bpi 9–track tape from your RSTS/E distribution kit whose label is SYSGNK. This tape contains the system generation files and programs. Note that there may be other programs and files on this tape. The chart in Chapter 3 of the *RSTS/E Release Notes* shows the contents of each tape.

To load the tape on the drive:

1. Mount the tape on drive unit 0 or 1 with the write-enable ring removed. If you have a combination of TU10, TE10, TS03 and TU16, TE16, TU45, and TU77 tape drives, load the 800 bpi distribution tape onto unit 0 or 1 of the TU10, TE10, or TS03 tape drive. If you have a combination of TU16, TE16, TU45, TU77, TS11, TSV05, and TU80 tape drives, load the 1600 bpi distribution tape on unit 0 or 1 of the TS11 drive. Press the LOAD indicator.
2. The drive automatically winds the tape until the beginning of tape (BOT) indicator light comes on. This indicates the tape is at its load point.
3. Make sure that the write-lock (WR) indicator light is on. (If not, remove the write-enable ring, in which case you must dismount the tape.)
4. Press the ONLINE indicator. The light on this indicator comes on.
5. Make sure the *console terminal* is online. The console terminal is usually a hard-copy terminal that you use during system generation.

Note

The previous instructions may not apply to your tape drive. If not, refer to the hardware manual supplied with your tape drive for the load instructions.

Bootstrap Distribution Tape Session

Now you must *bootstrap* the tape, which means using the PDP–11 Central Processing Unit (CPU) switches to activate a hardware bootstrap loader. There are different types of hardware bootstrap loaders; the type you have on your PDP–11 determines which CPU switches you should use.

The *hardware bootstrap loader* is a device inside your PDP–11 that reads a *bootstrap record* from the tape into memory. This bootstrap record contains a program that loads and executes additional program code from the tape.

Your DIGITAL field service representative or software support specialist should already have identified the type of hardware bootstrap loader on your PDP–11. The representative should also have given instructions for bootstrapping your tape.

If you do not know how to bootstrap the tape, see Appendix E, which contains bootstrap instructions for the different types of hardware bootstrap loaders.

The example installation shows how to bootstrap the 1600 bpi tape from a TE16 tape drive, by activating switches on a PDP–11/34. This PDP–11/34 has a M9312 hardware bootstrap loader. These bootstrap instructions are:

1. Simultaneously press the CTL and HALT switches on the CPU.
2. Simultaneously press the CTL and BOOT switches on the CPU.

The following prints on the example installation's console terminal:

```
000000 000001 000510 001274
@MM0
```

The commercial at sign (@) asks for the *device designator* or *device specification* of the drive your tape is mounted on. A device designator consists of two letters (that identify the device type) followed by the decimal unit number of the drive and a colon. (However, do not specify a colon here.) A TE16 tape drive is used in the example installation; thus, the tape device designator is MM0. Table 1 lists the tape device designators. Enter the device designator of your tape drive.

About 30 seconds after the device designator is entered, the following prints on the example installation's console terminal:

```
Enabling only console, disks, and tapes.

RSTS V8.0 (MM0) INIT V8.0-06

Option:
```

The Option: prompt means that INIT.SYS is loaded into memory. You have successfully bootstrapped your distribution tape. Note that the device designator of the tape drive you bootstrapped appears within parentheses. In the example installation, the device designator is MM0.

Table 1: Tape Device Designators

Designator	Device
MM0:to MM7:	TE16/TU16/TU45/TU77 magnetic tape units 0 to 7
MS0: to MS3:	TS11/TU80/TSV05 magnetic tape units 0 to 3
MT0:to MT7:	TE10/TU10/TS03 magnetic tape units 0 to 7

 Go to Phase 2.

Task 3B: Physically Mount and Bootstrap Distribution Disk

This task requires you to mount and bootstrap the appropriate disk from your RSTS/E distribution kit. First, the task provides instructions for mounting a disk onto a disk drive. Second, the task provides instructions and an example of bootstrapping this disk. The example uses an RL02 disk.

Note

This example is not part of the example installation, and is included here for those whose RSTS/E distribution kit consists of disks. The example installation that appears in the remainder of the manual uses a 1600 bpi distribution tape.

Disk Mount Session

Mount the disk from your RSTS/E distribution kit whose label is SYSGNK. This disk contains the system generation programs and files. Note that this disk may also contain other files and programs. The chart in Chapter 3 of the *RSTS/E Release Notes* shows the contents of each disk.

To load the disk onto the disk drive:

1. Physically mount the disk in drive unit 0 or 1.
2. Make sure that the READY light is on.
3. Make sure that the WR PROT (write-protect) light is on.
4. Make sure that the *console terminal* is online. The console terminal is usually a hard-copy terminal that you use during system generation.

Note

The previous load instructions may not apply to your disk drive. If not, see the hardware manual supplied with your disk drive for the load instructions.

Bootstrap Distribution Disk Session

Now you must *bootstrap* your disk, which means using the PDP–11 Central Processing Unit (CPU) switches to activate a hardware bootstrap loader. There are different types of hardware bootstrap loaders; the type you have on your PDP–11 determines which CPU switches you should use.

The *hardware bootstrap loader* is a device inside your PDP–11 that reads a *bootstrap record* from the disk into memory. This bootstrap record contains a program that loads and executes additional program code from the disk.

Your DIGITAL field service representative or software support specialist should already have identified the type of hardware bootstrap loader on your PDP–11. The representative should also have given instructions for bootstrapping your disk.

If you do not know how to bootstrap the disk, see Appendix E, which contains bootstrap instructions for the different types of hardware bootstrap loaders.

The following instructions explain how to bootstrap a disk from an RL02 disk drive to a PDP–11/34 that has a M9312 hardware bootstrap loader:

1. Simultaneously press the CTL and HALT switches on the CPU.
2. Simultaneously press the CTL and BOOT switches on the CPU.

The following message prints on the console terminal:

```
000000 174000 165212 165530
@DL0
```

The commercial at sign (@) asks for the *device designator* or *device specification* of the drive your distribution disk is mounted on. A device designator consists of two letters (that identify the device type) followed by the decimal unit number of the drive and a colon. (However, do not specify a colon here.) In the example, the device designator is DL0. Table 2 lists bootable disk device designators. Enter the device designator of your disk drive.

Within 30 seconds, the following message prints on the console terminal:

```
Enabling only console, disks, and tapes.

RSTS V8.0 (DL0) INIT V8.0-06

Option:
```

The Option: prompt means that INIT.SYS is loaded into memory. You have successfully bootstrapped your distribution disk. Note that the device designator of the disk drive you bootstrapped appears within parentheses. In the example, the device designator is DL0.

Table 2: Bootable Disk Device Designators

Designator	Device
DB0: to DB7:	RP04/RP05/RP06 disk drive units 0 to 7
DK0: to DK7:	RK05 disk drive units 0 to 7
DL0: to DL3:	RL01/RL02 disk drive units 0 to 7
DM0: to DM7:	RK06/RK07 disk drive units 0 to 7
DP0: to DP7:	RP02/RP03 disk drive units 0 to 7
DR0: to DR7:	RM02/RM03/RM05/RM80 disk drive units 0 to 7
DU0: to DU7:	RA60/RA80/RA81/RC25/RD51/RX50 disk drive units 0 to 7

Go to Phase 2.

Phase 2
Disk Preparation

After you bootstrap the distribution tape or disk, you are ready to prepare your *system disk*, and, (optionally for most of you) any *nonsystem disks*. The system disk is the disk where your RSTS/E monitor will reside. Nonsystem disks store other files and programs that might not fit on the system disk.

If you plan to build your RSTS/E monitor on a small disk (RL01), then you must prepare at least one nonsystem disk, which will store the system programs and files that will not fit on your system disk.

If you plan to build your RSTS/E monitor on a large disk (any disk other than an RL01), you can optionally prepare one or more nonsystem disks.

The tasks for preparing system and nonsystem disks are:

- Task 1: Physically Mount Your System Disk
- Task 2: Initialize Your System Disk (DSKINT)
- Task 3: Copy Files to Your System Disk (COPY)
- Task 4: Physically Mount Nonsystem Disk
- Task 5: Initialize Nonsystem Disk (DSKINT)
- Task 6: Calculate Number of Jobs
- Task 7: Calculate SWAP MAX
- Task 8: List File Status Table (REFRESH LIST)
- Task 9: Create System Files (REFRESH CHANGE)
- Task 10: List File Status Table (REFRESH LIST)

Task 1: Physically Mount Your System Disk

If you mounted a distribution tape in Phase 1, then mount your system disk on drive 0 or 1. If you mounted a distribution disk in Phase 1, then mount your system disk on a free drive, either 0 or 1.

Note

You must mount your system disk (as well as your distribution tape or disk) on drive 0 or 1 because the SYSGEN monitor recognizes only units 0 and 1 of each device type. If, for example, you mount your system disk on drive 2 at this stage, the SYSGEN monitor would fail during start-up.

Follow either the disk mount instructions in Task 3B of Phase 1 or the disk mount instructions in the appropriate hardware manual. Do not remove the distribution tape or disk that contains the system generation programs and files.

Go to Task 2.

Task 2: Initialize Your System Disk (DSKINT)

Your next task is to initialize the system disk with DSKINT, an INIT.SYS program option. DSKINT:

- Optionally formats the disk: DSKINT writes timing and sense marks on the disk and destroys any previously stored information.
- Optionally checks the disk for bad blocks: DSKINT locates bad blocks on the disk and allocates them to the *bad block file (BADB.SYS)*.
- Writes a minimum RSTS/E file structure on the disk: The *RSTS/E file structure* contains a bootstrap block and three directories: the Master File Directory (MFD), the Group File Directory (GFD), and the User File Directory (UFD) for account [0,1]. DSKINT also prepares the disk to accept RSTS/E system and other files.

Terminal Session

To initialize your system disk, you must answer some questions asked by DSKINT. This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after the question. Press LINE FEED to accept the default response, if it appears. Press CTRL/Z to return to the previous question. Press CTRL/C to abort DSKINT and return to the Option: prompt.

The common DSKINT dialogue error messages appear in Table 5, at the end of this task. If you receive an error message that does not appear there, see Appendix A.

```
000000 000001 0000510 001274
@MM0

Enabling only console, disks, and tapes.

RSTS V8.0 (MM0) INIT V8.0-06

Option:  DSKINT
```

Explanation — As stated in Phase 1, after you successfully bootstrap your distribution tape or disk, the bootstrap record loads INIT.SYS into memory and prints the message: Enabling only console, disks, and tapes. (In the example installation, this message is preceded by octal numbers and the at sign (@), to which the device designator MM0 is typed.) This message means INIT.SYS has only partially scanned the hardware configuration. This prevents INIT.SYS from incorrectly recognizing devices at nonstandard addresses. (You will have an opportunity in Phase 3 to declare any nonstandard addresses, if your installation requires it.)

Response — Type DSKINT or DS.

```
DD-MMM-YY? 15-DEC-82
```

Explanation — This question asks for the current date.

Response — Type the current date in either of two formats: the alphabetic format (15–DEC–82) or the numeric format (82.12.15). In the example installation, the response is in the alphabetic format.

```
HH:MM AM? 05:00 AM
```

Explanation — After you type the date, DSKINT asks for the current time.

Response — Type the current time in either of two formats: AM/PM format (05:00 AM), or 24–hour format (05:00). In the example installation, the response is in the AM/PM format.

```
Disk? DM
```

Explanation — This question asks for the device designator of your system disk.

Response — Acceptable responses for system disks are: DK, DL, DM, DP, DR, DB, or DU. In the example installation, the response is DM because the system disk is an RK06.

```
Unit? 0
```

Explanation — This question asks for the unit number of the disk drive on which your system disk is mounted.

Response — Acceptable responses at this stage of system generation are 0 or 1. The response is 0 in the example installation.

```
This disk appears to be a RSTS/E formatted
disk with the following characteristics:

Pack ID:                TIGRIS
Pack Cluster Size:      8
Pack is currently:      Private,
                        Update access date on writes.

Pack ID? SYSDSK
```

Explanation — After you type the unit number, DSKINT prints the disk's pack label information, if the disk has been initialized before. If this disk had not been initialized before, DSKINT would not have printed this identifying information. The *pack label information* lists: the pack ID, pack cluster size, pack status (public or private), whether files are catalogued with the date they were last modified (written to) or accessed (read, opened, closed, and so forth), new files first information, and whether the disk is read-only. This private disk could be a system disk; DSKINT cannot determine whether a private disk is also a system disk. In the example installation, the pack ID is TIGRIS, the pack cluster size is 8, the pack status is private, and the files are catalogued with the date they were last written to.

This information lets you decide whether to initialize the disk. When you initialize a disk, you destroy any information stored on it. Because this disk contains no vital information, it will be initialized and used as the new system disk.

After printing the pack label information, DSKINT asks for a pack ID. The *pack ID* is a system-wide logical name. You must specify this pack ID when you logically mount the disk.

Response — Type a one- to six-character alphanumeric pack ID. The pack ID in the example installation is SYSDSK.

```
Pack cluster size <1>? 4
```

Note

Some questions show a response within brackets, like the one in this question (<1> ?). This is the default response. To accept any default response, press LINE FEED. (The LINE FEED and RETURN responses do not print on your console terminal. They appear in the example installation to show you that the LINE FEED or RETURN key was chosen as a response.)

Explanation — A *cluster* is a fixed number of 512–byte blocks of storage area allocated contiguously on a disk. The *pack cluster size* is the minimum number of blocks that your RSTS/E monitor can allocate to a file on the disk.

Your answer to this question depends on the type of processing and the disk requirements of your installation. The pack cluster size affects disk space and speed of file creation and access. A large pack cluster size improves access time to programs and user files because the monitor reads and writes data in cluster units. For example, if the pack cluster size is 16, the monitor reads or writes 16 blocks at a time. However, if the pack cluster size is two the monitor reads or writes only two blocks at a time. Thus, more disk accesses are needed to read the same amount of information.

On the other hand, a large pack cluster size may waste disk space. For example, if you assign a pack cluster size of 16, the monitor allocates one cluster of 16 contiguous blocks (8,192 bytes) to a file that contains only one block (512 bytes) of information. Fifteen blocks (7,680 bytes) are wasted. Likewise, the monitor allocates one cluster of 16 contiguous blocks to a 15–block (7,680 bytes) file. In this case, only one block (512 bytes) is wasted.

Response — The possible disk pack cluster sizes are shown in Table 3. For system disks, DIGITAL recommends a pack cluster size of 4 or greater. The response is 4 in the example installation.

Table 3: Disk Pack Cluster Sizes

Disk Type	Pack Cluster Size
RX50	1, 2, 4, 8, 16
RC25	1, 2, 4, 8, 16
RD51	1, 2, 4, 8, 16
RF11*	1, 2, 4, 8, 16
RS03*	1, 2, 4, 8, 16
RS04*	1, 2, 4, 8, 16
RK05	1, 2, 4, 8, 16
RK05F	1, 2, 4, 8, 16
RL01	1, 2, 4, 8, 16
RL02	1, 2, 4, 8, 16
RK06	1, 2, 4, 8, 16
RK07	1, 2, 4, 8, 16
RP02	2, 4, 8, 16
RP03	2, 4, 8, 16
RM02	4, 8, 16
RM03	4, 8, 16
RP04	4, 8, 16
RP05	4, 8, 16
RA80	4, 8, 16
RM80	4, 8, 16
RP06	8, 16
RA60	8, 16
RM05	8, 16
RA81	16

*You cannot use these disks as system disks.

```
MFD cluster size <16>? (LF)
```

Explanation — The *master file directory (MFD)* stores information about all accounts on a disk. The monitor accesses the MFD each time accounts and files are added or deleted from the disk.

This question asks for the *MFD cluster size*, which is the maximum number of 512–byte blocks that each cluster allocated to the MFD can contain. The MFD can have a maximum of seven clusters (if you answer Y to the Pre-extend directories? question), and each is the size that you specify here.

Response — Type the MFD cluster size: 4, 8, or 16. It must be greater than or equal to the pack cluster size and must not be greater than 16. To accept the default response press LINE FEED, as in the example installation.

```
SATT.SYS base <13543>? (LF)
```

Explanation — The *SATT.SYS file* controls the use of storage space on a disk through a storage allocation table (SAT). The monitor accesses this file each time you extend or delete files. This question asks where you want to position this file on the disk. For moving-head disks, it is advantageous to position the SATT.SYS file near the center, to reduce average seek times for the disk heads. On the other hand, if you use only the first half of a disk or need to create large contiguous files, then you may want to locate SATT.SYS in a place other than the center.

Response — Press LINE FEED to have DSKINT position the file near the center of the disk, as in the example installation. (The number that appears within brackets is the center of the disk as calculated by DSKINT. DSKINT may calculate a different number for your disk.) To position the SATT.SYS file yourself, type the device cluster number where you want the file placed. The device cluster number can range from 1 to the total device size divided by the device cluster size. See Table 4 for a list of device cluster sizes and total device sizes. In the example installation, the response is LINE FEED, which means DSKINT positions SATT.SYS near the center of the disk.

Table 4: Device Cluster Sizes and Total Device Sizes

Disk Type	Device Cluster Size	Total Device Size (in blocks)
RX50	1	800
RC25	1	50902 per unit; 2 units per spindle
RD51	1	21600
RF11*	1	1024 times number of platters
RS03*	1	1024
RS04*	1	2048
RK05	1	4800
RK05F	1	4800 per unit; 2 units per drive
RL01	1	10220
RL02	1	20460
RK06	1	27104
RK07	1	53768
RP02	2	40000
RP03	2	80000
RM02	4	131648

(continued on next page)

Table 4: Device Cluster Sizes and Total Device Sizes (Cont.)

Disk Type	Device Cluster Size	Total Device Size (in blocks)
RM03	4	131648
RP04	4	171796
RP05	4	171796
RA80	4	237208
RM80	4	242575
RP06	8	340664
RA60	8	400175
RM05	8	500352
RA81	16	888012

*You cannot use these disks as system disks.

```
Pre-extend directories <NO>? YES
```

Explanation — This question asks if you want DSKINT to automatically allocate a maximum of seven clusters to the system account [0,1], the LB: library account [1,1], the system library account [1,2], and the MFD and GFDs for groups 0 and 1. The number of blocks each of these seven clusters contains depends on how you answered the cluster size questions for each of these accounts. For example, if you specify 16 as the cluster size for account [1,2] and answer YES to this question, DSKINT allocates the maximum of seven clusters to this account. Each cluster is 8,192 bytes (16 times 512 bytes).

Response — Type YES to have DSKINT automatically allocate a maximum of seven clusters to these accounts. When you answer YES to this question, DSKINT attempts to allocate all seven clusters adjacent to each other, which improves directory search times.

Type NO or press LINE FEED if you want DSKINT to allocate only the minimum of 0 or 1 clusters. In the example installation, the response is YES.

```
PUB, PRI, or SYS <PRI>? SYS
```

Explanation — This question asks you to designate the disk you are initializing as either public, private, or system. The system disk is the disk on which the RSTS/E monitor resides. It always contains account [1,2].

Response — Because you are initializing a system disk in this task, type SYS, as in the example installation.

```
[1,1] password <*>? NICTU
```

Explanation — When you initialize a system disk, DSKINT automatically creates account [1,1], the LB: library account. This question asks for the password for account [1,1].

Response — Press LINE FEED to accept the asterisk (*) or "no access" default, which means no one will be able to log in to this account.

Or, type a one- to six-character alphanumeric password of your choice. In the example installation, the password is NICTU.

```
[1,1] cluster size <16>? LF
```

Explanation — This question asks for the cluster size for the *User File Directory (UFD)* for account [1,1]. The UFD is an area on the disk that stores information about the files created under a particular user account number. The cluster size for account [1,1] is the maximum number of 512–byte blocks that each cluster allocated to this account can contain.

Response — Type the cluster size for account [1,1]: 1, 2, 4, 8, or 16. It must be greater than or equal to the pack cluster size and must not be greater than 16. Specifying a large cluster size improves disk access time. Press LINE FEED to accept the default response of 16, as in the example installation.

Because the answer to the Pre-extend directories? question was YES, DSKINT allocates the maximum of seven clusters, each containing 8,192 bytes (16 times 512 bytes), to this account.

```
[1,2] password? MIRAGE
```

Explanation — DSKINT automatically creates account [1,2], the system library account, when you initialize a system disk. This question asks for a password for account [1,2].

Response — Type a one- to six-character alphanumeric password of your choice. In the example installation, the password for account [1,2] is MIRAGE.

```
[1,2] cluster size <16>? LF
```

Explanation — This question asks for the cluster size for the UFD for account [1,2]. The cluster size for account [1,2] is the maximum number of 512–byte blocks that each cluster allocated to this account can contain.

Response — Type the cluster size for account [1,2]: 1, 2, 4, 8, or 16. It must be greater than or equal to the pack cluster size and must not be greater than 16. DIGITAL recommends the cluster size for account [1,2] be 16, to improve disk access time. Press LINE FEED to accept the default response of 16, as in the example installation.

Because the answer to the Pre-extend directories? question was YES, DSKINT allocates the maximum of seven clusters, each containing 8,192 bytes (16 times 512 bytes), to this account.

```
[1,1] and [1,2] account base <13541>? (LF)
```

Explanation — This question asks whether you want to place accounts [1,1] and [1,2] near the center of the disk or in some other place. (The number that appears within brackets is the position of SATT.SYS, that is, the number you specified to the SATT.SYS base? question, or the middle of the disk as calculated by DSKINT if you specified LINE FEED to that question. DSKINT may show a different number for your disk.)

Response — Press LINE FEED if you want DSKINT to place this account near the center of the disk, as in the example installation. Or, type the device cluster number where you want these files placed. The device cluster number can range from 1 to the total device size divided by the device cluster size. See Table 4 for a list of device cluster sizes and total device sizes.

```
Date last modified <YES>? (LF)
```

Explanation — This question asks whether you want to retain the date on which files were last modified (written to) or last accessed (written to, opened, closed, and so forth).

Response — Type YES or press LINE FEED to retain the date on which files were last modified. This response is useful if you plan to use the BACKUP system program to back up files that have changed since the last backup. This response also decreases disk activity because the RSTS/E monitor updates the date only if the files are written to.

Type NO to retain the date on which files were last accessed. This response is useful for reordering the files, so the most frequently accessed files can be placed at the beginning of the directory. This response increases disk activity because the RSTS/E monitor updates the date no matter how the file is accessed for reads or writes.

In the example installation, the response is LINE FEED, which means DSKINT updates the date each time the files are modified.

```
New files first <NO>? (LF)
```

Explanation — This question asks if you want newly created files placed at the beginning or end of the directory of the account in which they are created.

Response — DIGITAL recommends that you type NO or press LINE FEED to place newly created files at the end of the directory, giving you overall faster access time.

Type YES to place newly created files at the beginning of the directory. This response is useful when you have a private disk on which the files you most frequently access are new files. In the example installation, LINE FEED is the response.

```
Read-Only <NO>? (LF)
```

Explanation — This question asks if you want this disk to be a read-only or read/write device when it is logically mounted. You can write to a read-only disk when you logically mount it with the /WRITE qualifier.

Response — Press LINE FEED, as in the example installation. You want your system disk to be read/write.

```
Use previous bad block info <YES>? (LF)
```

Explanation — This question does not appear if you are initializing a new disk. The question asks if you want DSKINT to create a new bad block file (BADB.SYS) in system account [0,1] by using information from the existing bad block file. DSKINT checks each block on the disk (if you answer 1, 2, or 3 to the Patterns? question). If it finds unreliable blocks, it allocates the pack cluster in which the block resides to the BADB.SYS file.

Response — DIGITAL recommends that you type YES or press LINE FEED to create the new bad block file, using information from the existing bad block file.

Type NO to have DSKINT ignore the current bad block file when creating the new one. In the example installation, the response is LINE FEED.

```
Format <NO>? YES
```

Explanation — This question asks if you need to format your disk. Formatting a disk means that DSKINT writes timing and sense marks onto the disk and destroys any information that previously existed on the disk. You must format the following disks if you are initializing them for the first time:

RK05, RK05F, RP02, RP03, RP04, RP05, RP06

You can optionally reformat these disks:

RK06, RK07, RM02, RM03, RM05

You cannot format or reformat (in which case this question would not appear) these disks:

RL01, RL02, RA60, RA80, RA81, RC25, RM80, RD51, RX50

Note

DIGITAL recommends that if you format a disk, you mount the disk on the drive and leave it spinning for about 15 minutes before initializing it. This ensures that the disk temperature is stable and uniform during the formatting. Failure to do this may cause unreliable data storage on the disk.

Response — Type YES to format the disk; type NO or press LINE FEED if you do not need to format the disk. In the example installation, the response is YES, which means DSKINT will reformat an RK06 system disk.

```
Patterns <3>? (RET)
```

Explanation — This question asks for the number of patterns DSKINT should use in checking for bad blocks. DSKINT writes a pattern to the disk, and then reads it to check that the data was written correctly. The time DSKINT takes to run these pattern checks for bad blocks depends on the disk you are initializing. Press RETURN, as in the example installation, to have DSKINT print the time (in minutes) required for the different disks to complete one format check for bad blocks.

```
Number of patterns to use in checking for bad blocks (0-3).
Time required per pattern (minutes):
DF=.25/platter, DK=1, DL=2.0, DM=2.5, DP, DB, DR, & DU=10.
How many patterns should be used in checking the disk? 3
```

Explanation — After DSKINT prints the times, it asks how many patterns you want to run. If you select 0 patterns, DSKINT does not check for bad blocks. It merely writes all blocks to the disk, thus erasing any information previously on the disk. This is done for security. Do not specify 0 unless:

- You are initializing a disk that has been initialized before.
- You answered YES to the Use previous bad block info? question.
- You are confident no additional bad blocks are on the disk.

Response — Type the number of patterns (0 to 3). DIGITAL recommends you run 3. Any bad blocks discovered during pattern checking are added to the bad block file (BADB.SYS) so that data will not be written to these blocks. Append an X to your response if you want to specify your own patterns. DSKINT then asks the next question. In the example installation, the response is 3.

```
Your pattern?
```

Explanation — This question, which appears only if you appended an X to your response in the previous question, asks you to specify your own patterns. This question is mainly for DIGITAL field service engineers. If you specify your own patterns, choose patterns different from the ones provided by DIGITAL. The 3–word values provided by DIGITAL and used by DSKINT during pattern checking are:

Pattern	**3–Word Values**		
1	155555	133333	066666
2	133333	066666	155555
3	066666	155555	133333

Response — Specify a pattern, which must be one octal word. DSKINT repeats the question until you have typed eight patterns or pressed LINE FEED eight times. In the example installation, there is no response because an X was not appended to the answer in the previous question.

```
Proceed (Y or N)? Y
```

Explanation — This question allows you to check your responses to the dialogue questions and abort the initialization if you have made any errors.

Response — Type Y to proceed with the disk initialization. Type N to abort the initialization and return to the Option: prompt. In the example installation, Y is the response.

Figure 2 shows the entire DSKINT dialogue, the answers chosen by the example installation, and the corresponding output. Note that DSKINT begins pattern checking with pattern 3 and ends with pattern 1. If DSKINT prints a block and device cluster number during pattern checking, it adds the device cluster number (not the block number) to the BADB.SYS file. Note that this disk did not contain any bad blocks.

Note

When you are formatting RP02 or RP03 disks, DSKINT prints two requests after the Starting and Ending format pass messages:

```
SET FORMAT ENABLE SWITCH, THEN TYPE (LF):
```

Set the RP11 controller FORMAT ENABLE/NORMAL switch to ENABLE, then press LINE FEED.

```
SET FORMAT SWITCH TO NORMAL, THEN TYPE (LF):
```

Set the RP11 controller FORMAT ENABLE/NORMAL switch to NORMAL, then press LINE FEED.

Go to Task 3.

```
000000 000001 000510 001274
@MMO

Enabling only console, disks, and tapes.

RSTS V8.0 (MMO) INIT V8.0-06

Option: DSKINT

DD-MMM-YY? 15-DEC-82
HH:MM AM/PM 05:00 AM

Disk? DM
Unit? 0

This disk pack appears to be a RSTS/E formatted
disk with the following characteristics:
```

(continued on next page)

Figure 2: DSKINT Dialogue and Example Installation Output

```
Pack ID:                  TIGRIS
Pack Cluster Size:        8
Pack is currently:        Private,
                          Update access date on writes.

Pack ID? SYSDSK
Pack cluster size <1>? 4
MFD cluster size <16>? (LF)
SATT.SYS base <13543>? (LF)
Pre-extend directories <NO>? YES
PUB, PRI, or SYS <PRI>? SYS
[1,1] password <*>? NICTU
[1,1] cluster size <16>? (LF)
[1,2] password <*>? MIRAGE
[1,2] cluster size <16>? (LF)
[1,1] and [1,2] account base <13541>? (LF)
Date last modified <YES>? (LF)
New files first <NO>? (LF)
Read-Only <No>? (LF)
Use previous bad block info <YES>? (LF)
Format <NO>? (LF)
Patterns <3>? (LF)
Proceed (Y or N)? Y

Disk pack serial number = 56172

Starting format pass
End format pass

Pattern 3
Pattern 2
Pattern 1

Option:
```

Figure 2: DSKINT Dialogue and Example Installation Output (Cont.)

Table 5: DSKINT Error Messages

Message and Meaning
BLOCK NUMBER TOO BIG The block number you typed is greater than or equal to the maximum logical block number for the disk.
DRIVE NOT READY The initialization cannot proceed because the disk to be initialized is not online and ready. You can make the drive ready and press LINE FEED to proceed, or you can press CTRL/C to abort the initialization.
DSKINT NOT LEGAL ON SYSTEM DISK You specified the disk from which the initialization code was bootstrapped. You cannot initialize this disk now because the initialization code would be destroyed.
ILLEGAL DISK NAME The string you typed is not the name of a valid RSTS/E disk device. Enter a valid name.
ILLEGAL NUMBER, TRY AGAIN The number you typed is not a valid octal number between 1 and 177777.
SORRY, BUT THAT DISK DOESN'T EXIST The string you typed is a valid RSTS/E disk name, but that disk controller or the unit number does not exist on this system.

Task 3: Copy Files to Your System Disk (COPY)

Your next task is to copy files from account [0,1] on the distribution tape or disk to the system disk. To copy the required files, use COPY, an INIT.SYS program option.

Some of the files that COPY transfers from the distribution tape or disk are:

- INIT.SYS file – stores the program INIT.SYS. The INIT.SYS program provides the options (for example, DSKINT, COPY, REFRESH) you need to generate your monitor.
- SYSGEN.SIL file – stores the SYSGEN monitor code provided by DIGITAL.
- RT11.RTS file – stores the RT11 run-time system, which is the run-time system that the SYSGEN monitor runs under.
- ERR.ERR file – stores the system error messages.

Terminal Session

This terminal session lists the questions asked by COPY, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response printed in red in the example installation.

If you want an online explanation, press RETURN after any question. Press CTRL/C as a response to any question to return to the Option: prompt. The common error messages appear in Table 6, at the end of this task. If your error message does not appear there, see Appendix A.

```
Option: COPY
```

Explanation — The Option: prompt appears after DSKINT performs pattern checks on your system disk. You can now use the COPY option to transfer only the required files to your system disk.

Response — Type COPY or CO.

```
15-DEC-82? (LF)
```

Explanation — COPY prints the date in the format you specified in Task 2 of this phase.

Response — Press LINE FEED to accept the current date.

```
05:17 AM? (LF)
```

Explanation — This question prints the time in the format you specified in Task 2 of this phase.

Response — Press LINE FEED to accept the current time.

```
To which disk? DM
```

Explanation — This question asks for the device designator of your system disk.

Response — Possible responses are: DK, DL, DM, DP, DB, DR, or DU. The response is DM in the example installation.

Note

Some installations may need to use the /A switch to copy all the files that have .SIL, .RTS, and .ERR file types, if you have a disk or tape that has more than one of these file types. To do this, just append a /A to the response you made to the previous question (for example DL/A). However, most installations would never need to use this switch and it is not recommended you use this switch if you are copying files from the RSTS/E distribution tape or disk.

```
Physical unit number? 0
```

Explanation — This question asks for the unit number of the drive on which your system disk is mounted.

Response — Possible responses at this stage of system generation are 0 or 1. The response is 0 in the example installation.

```
Enabling only console, disks, and tapes.

RSTS V8.0 (DM0) INIT V8.0-06

Option:
```

Explanation — After you type the unit number, COPY transfers the file to the system disk. Upon completion, COPY automatically bootstraps your system disk, prints a message on your console terminal, and returns to the Option: prompt.

If you have previously copied these files to your system disk, you will see the message: FILE filnam.type EXISTS: SUPERSEDE? Type Y to replace the file with the new file of the same name; type N to retain the file on the disk; press CTRL/C to abort COPY and return to the Option: prompt.

Note

At this point in system generation you might have to manually install a patch to the SYSGEN monitor or the INIT.SYS program before continuing with system generation. Should this ever occur, your software support representative or the *RSTS/E Release Notes* will provide you with the instructions for applying this patch.

Go to Task 4 if you need to initialize nonsystem disks.

If you do not need to initialize nonsystem disks, go to Task 6.

Table 6: COPY Error Messages

Message and Meaning
`CANNOT COPY TO THE SYSTEM DISK` You specified the current system disk, which is invalid as an output disk for the COPY option. Specify another disk.
`ILLEGAL DISK NAME` You typed an invalid disk name. All DF and DS disks are illegal.
`INVALID UNIT NUMBER` The disk unit number you specified does not exist on this system.
`INVALID RESPONSE` The only valid responses to the FILE FILNAM.TYP EXISTS: prompt are Y, N, or CTRL/C, and you typed something else.
`SORRY, BUT THAT DISK DOESN'T EXIST` The disk type you specified does not exist on this system.

Task 4: Physically Mount Nonsystem Disk

If you are building a RSTS/E monitor on an RL01 disk, you must initialize a nonsystem disk. This way you can store files and programs that will not fit on your system disk.

Even though you may be building a RSTS/E monitor on a large system disk, you may want to initialize a nonsystem disk in this phase. Then you can store system programs and other files on the nonsystem disk, thereby freeing valuable space on your system disk. The example installation plans to initialize another RK06 disk as a nonsystem disk.

Mount the nonsystem disk on a free drive. Follow either the disk mount instructions in Task 3B of Phase 1, or the disk mount instructions in the appropriate hardware manual. Do not remove the distribution tape or disk that contains the system generation programs and files. Do not remove your system disk.

Go to Task 5.

Task 5: Initialize Nonsystem Disk (DSKINT)

Terminal Session

To initialize your nonsystem disk, you must answer some questions asked by DSKINT. This terminal session provides the questions and explains them only if the question did not appear when you initialized your system disk. Otherwise, the session gives only the possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after any question. Press CTRL/Z to return to the previous question. Press CTRL/C to return to the Option: prompt.

The common DSKINT error messages appear in Table 5, located at the end of Task 2 of this phase.

```
Option: DSKINT
```

Response — You stopped here in Task 3. Type DSKINT or DS.

```
15-DEC-82? (LF)
```

Response — Press LINE FEED to accept the current date.

```
05:20 AM? (LF)
```

Response — Press LINE FEED to accept the current time.

```
Disk? DM
```

Response — Acceptable nonsystem disk responses are: DF, DS, DK, DL, DM, DP, DR, DB, or DU. If your response is DF, Platters? is the next question.

In the example installation, the response is DM because an RK06 is the nonsystem disk.

```
Unit? 1
```

Response — Acceptable responses are 0 or 1. The response is 1 in the example installation.

```
Platters <n>?
```

Explanation — This question asks for the number of platters for your RF11 (DF) disk. The letter n represents the number of platters DSKINT found.

Response — Press LINE FEED to accept the default number. Or, type the number (1 to 8) of platters connected to the RF controller.

```
This disk appears to be a RSTS/E formatted
disk with the following characteristics:

Pack ID:                TORKLE
Pack Cluster Size:      8
Pack is currently:      Public.

Pack ID? WRKDSK
```

Response — Type a one- to six-character alphanumeric pack ID. The pack ID chosen in the example installation is WRKDSK.

```
Pack cluster size <1>? 4
```

Response — See Table 3 in Task 2 of this phase for the disk pack cluster sizes. In the example installation, the pack cluster size is 4.

```
MFD cluster size <16>? (LF)
```

Response — Type the MFD cluster size: 4, 8, or 16. It must be greater than or equal to the pack cluster size and must not be greater than 16. You can change the answer you type here only by reinitializing the disk. In the example installation, the default response of 16 is chosen by pressing LINE FEED.

```
SATT.SYS base <13543>? (LF)
```

Response — Press LINE FEED to have DSKINT position the file near the center of the disk. To position the SATT.SYS file yourself, type the device cluster number where you want the file placed. The device cluster number can range from 1 to the total device size divided by the device cluster size. See Table 4 in Task 2 of this phase for a list of device cluster sizes and total device sizes. In the example installation, the response is LINE FEED, which means DSKINT positions SATT.SYS near the center of the disk.

```
Pre-extend directories <NO>? YES
```

Response — Type YES to have DSKINT automatically allocate a maximum of seven clusters to accounts [0,1], [1,1], and [1,2]. When you answer YES to this question, DSKINT attempts to allocate all seven clusters adjacent to each other, which improves directory search times.

Type NO or press LINE FEED if you want DSKINT to allocate only the minimum of 0 or 1 clusters. In the example installation, the response is YES.

```
PUB, PRI, or SYS <PRI>? (LF)
```

Response — DIGITAL recommends you press LINE FEED, as in the example installation, to indicate this disk will be used as a private disk. This response reduces the overhead on systems with multiple disk drives. The PUB response forces the monitor to search the directories of all public disks whenever a file is created, to ensure the same file name does not already exist. This slows system performance.

```
Create [1,1] account <NO>? YES
```

Explanation — This question appears only if you typed PUB or PRI to the previous question. It asks if you want to create account [1,1].

Response — Type YES to create this account, as in the example installation. DSKINT then displays two more questions related to account [1,1].

Type NO if you do not want to create this account. DSKINT skips to the Create [1,2] account? question. You can also create, pre-extend, and position account [1,1] with the REACT program after you build your monitor and start timesharing.

```
[1,1] password <*>? (LF)
```

Response — Press LINE FEED to accept the asterisk (*) or "no access" default. Because this is a private disk, this password is never used. Or, type a one- to six-character alphanumeric password of your choice. In the example installation, LINE FEED is the response.

```
[1,1] cluster size <16>? (LF)
```

Response — Type the cluster size for account [1,1]: 1, 2, 4, 8, or 16. It must be greater than or equal to the pack cluster size and must not be greater than 16. Or, press LINE FEED to accept the default response of 16. Specify a large cluster size to improve disk access time.

In the example installation, LINE FEED is the response. Because the answer to the Pre-extend directories? question was YES, DSKINT allocates the maximum of seven clusters, each containing 8,192 bytes (16 times 512 bytes), to this account.

```
Create account [1,2] <NO>? YES
```

Explanation — This question appears only if you typed PUB or PRI to the previous question. It asks if you want to create account [1,2].

Response — Type YES to create this account, as in the example installation. DSKINT then displays two more questions related to account [1,2].

Type NO or press LINE FEED if you do not want to create this account. You can also create, pre-extend, and position this account with the REACT program after you build your monitor and start timesharing.

```
[1,2] password <*>? (LF)
```

Response — Press LINE FEED to accept the asterisk (*) or "no access" default. Because this is a private disk, this password is never used. Or, type a one- to six-character alphanumeric password of your choice. In the example installation, the response is LINE FEED.

```
[1,2] cluster size <16>? (LF)
```

Response — Type the cluster size for account [1,2]: 1, 2, 4, 8, or 16. It must be greater than or equal to the pack cluster size and must not be greater than 16. Or, press LINE FEED to accept the default response of 16. DIGITAL recommends a cluster size of 16 for account [1,2] to improve disk access time.

In the example installation, the response is LINE FEED.

```
[1,1] and [1,2] account base <13541>? (LF)
```

Response — This question appears only if you create accounts [1,1] and/or [1,2]. Press LINE FEED if you want DSKINT to place this account near the center of the disk; type the device cluster number where you want these files placed. The device cluster number can range from one to the total device size divided by the device cluster size. See Table 4 in Task 2 of this phase for a list of device cluster sizes and total device sizes.

In the example installation, LINE FEED is the response, which means DSKINT locates these accounts as close to the center as possible.

```
Date last modified <YES>? (LF)
```

Response — Type YES or press LINE FEED to retain the date on which files were last modified. Type NO to retain the date on which files were last accessed.

In the example installation, the response is LINE FEED, which means DSKINT updates the date each time the files are modified.

```
New files first <NO>? (LF)
```

Response — DIGITAL recommends that you type NO or press LINE FEED to place newly created files at the end of the directory, giving you overall faster access time.

Type YES to place newly created files at the beginning of the directory. This response is useful when you have a private disk on which the files you most frequently access are new files. In the example installation, LINE FEED is the response.

```
Read-Only <NO>? (LF)
```

Response — Type YES to make this disk a read-only device when you logically mount it; press LINE FEED to make this disk a read/write device, as in the example installation. You want your nonsystem disk to be a read/write device.

```
Use previous bad block info <YES>? (LF)
```

Response — DIGITAL recommends that you type YES or press LINE FEED to create the new bad block file, using information from the existing bad block file.

Type NO to have DSKINT ignore the current bad block file when creating the new one. In the example installation, the response is LINE FEED.

```
Format <NO>? YES
```

Response — You must format these disks if you are initializing them for the first time:

RK05, RK05F, RP02, RP03, RP04, RP05, RP06

You can optionally reformat these disks:

RK06, RK07, RM02, RM03, RM05

You cannot format or reformat (in which case this question would not appear) these disks:

RL01, RL02, RA60, RA80, RA81, RC25, RM80, RD51, RX50

Type YES to format the disk; type NO or press LINE FEED if you do not need to format the disk. In the example installation, the response is YES, which means DSKINT will reformat an RK06 system disk.

Note

DIGITAL recommends that if you format a disk, you mount the disk on the drive and leave it spinning for about 15 minutes before initializing it. This ensures that the disk temperature is stable and uniform during the formatting. Failure to do this may cause unreliable data storage on the disk.

```
Patterns <3>? (LF)
```

Response — Type the number of patterns (0 to 3). DIGITAL recommends you run 3. Any bad blocks discovered during pattern checking are added to the bad block file (BADB.SYS) so that data will not be written to these blocks. Append an X to your response if you want to specify your own patterns. DSKINT then asks the next question. In the example installation, the response is 3.

```
Your pattern?
```

Response — Specify a pattern, which must be one octal word. DSKINT repeats the question until you have typed eight patterns or pressed LINE FEED eight times. In the example installation, there is no response because an X was not appended to the answer in the previous question.

```
Proceed (Y or N)? YES
```

Response — Type YES to proceed with the disk initialization. Type NO to abort the initialization and return to the Option: prompt. In the example installation, YES is the response.

Figure 3 shows the entire DSKINT dialogue for nonsystem disks, the answers chosen by the example installation, and the corresponding output. Note that DSKINT begins pattern checking with pattern 3 and ends with pattern 1. If DSKINT prints a block and cluster number during pattern checking, it adds the device cluster number to the BADB.SYS file (for example, device cluster numbers 2948 and 3271 in Figure 3). Errors that DSKINT marks as Recoverable (there are none in this example) are not added to this file. Note also the figure shows the serial number of the disk and the factory bad block data.

Note

When you are formatting RP02 or RP03 disks, DSKINT prints two requests after the Starting and Ending format pass messages:

```
SET FORMAT ENABLE SWITCH, THEN TYPE (LF) :
```

Set the RP11 controller FORMAT ENABLE/NORMAL switch to ENABLE, then press LINE FEED.

```
SET FORMAT SWITCH TO NORMAL, THEN TYPE (LF) :
```

Set the RP11 controller FORMAT ENABLE/NORMAL switch to NORMAL, then press LINE FEED.

Go to Task 6.

```
Option: DSKINT

15-DEC-82? (LF)
05:20 AM? (LF)

Disk? DM
Unit? 1

This disk pack appears to be a RSTS/E formatted
disk with the following characteristics:

Pack ID:              TORKLE
Pack Cluster Size:    8
Pack is currently:    Public.
```

(continued on next page)

Figure 3: DSKINT Dialogue and Example Installation Output for Nonsystem Disk

```
Pack ID? WRKDSK
Pack cluster size <1>? 4
MFD cluster size <16>? LF
SATT.SYS base <13543>? LF
Pre-extend directories <NO>? YES
PUB, PRI, or SYS <PRI>? LF
Create account [1,1] <NO>? YES
[1,1] password <*>? LF
[1,1] cluster size <16>? LF
Create account [1,2]? <NO>? YES
[1,2] password <*>?
[1,2] cluster size <16>? LF
[1,1] and [1,2] account base <13541>? LF
Date last modified <YES>? LF
New files first <NO>? LF
Read-Only <NO>? LF
Use previous bad block info <YES>? LF
Format <NO>? YES
Patterns <3>? LF
Proceed (Y or N)? Y

Current BADB.SYS
   DCN         PCN
----------------
11793        2948
13081        3270

Disk pack serial number = 3136

Factory bad block data:
   Cyl  Track  Sec   Block  Cluster
   178    2     3    11795    2948
   198    0    17    13085    3271

Starting format pass
End format pass

Pattern 3

DMO Error     RKCS1    RKWC     RKDA     RKCS2    RKDS     RKER     RKDCYL
              100222   172502   001003   000200   100301   000200   000262
              100222   177502   001003   000200   100301   000200   000262
Block Cluster
11795 2948
              100222   175202   000021   000200   100301   000200   000306
              100222   177502   000021   000200   100301   000200   000306
13085 3271

Pattern 2

DMO Error     RKCS1    RKWC     RKDA     RKCS2    RKDS     RKER     RKDCYL
              100222   172502   001003   000200   100301   000200   000262
              100222   177502   001003   000200   100301   000200   000262
11795 2948
              100222   172502   00021    000200   100301   000200   000306
              100222   177502   00021    000200   100301   000200   000306
13085 3271
```

(continued on next page)

Figure 3: DSKINT Dialogue and Example Installation Output for Nonsystem Disk (Cont.)

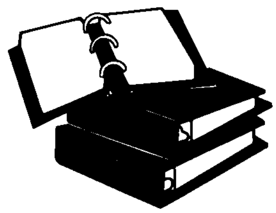
```
Pattern 1

DMO Error       RKCS1     RKWC      RKDA      RKCS2     RKDS      RKER      RKDCYL
                100222    172502    001003    000200    100301    000200    000262
                100222    177502    001003    000200    100301    000200    000262
11795 2948
                100222    172502    000021    000200    100301    000200    000306
                100222    177502    000021    000200    100301    000200    000306
13085 3271

Option:
```

Figure 3: DSKINT Dialogue and Example Installation Output for Nonsystem Disk (Cont.)

Task 6: Calculate Number of Jobs

Before you can further prepare your disks, you need to calculate the maximum number of jobs your system needs. You need to know the number of jobs in order to create your swap files (described in Task 9 of this phase). There is no terminal session in this task, only a preparation session.

Preparation Session



The RSTS/E monitor keeps track of all users' activities by assigning them *jobs*. To calculate the maximum number of jobs your system needs, add the following:

- Number of terminals you have or plan to have.
- Number of *pseudo keyboards* you need. A pseudo keyboard is a logical device that has the characteristics of a terminal, but has no physical terminal associated with it.
- One *detached job* for ERRCPY, the error logger program that reads error-related information stored in the monitor area of memory. A detached job is a job that is not associated with a terminal. (See the *RSTS/E System Manager's Guide* for information on ERRCPY.)
- Two detached jobs for OPSER and QUEMAN. One detached job for each copy of the SPOOL (SPL for the micro–RSTS spooling package), and BATCH programs. These programs are part of the RSTS/E spooling package, which supports line printer spooling and batch processing. See the *RSTS/E System Manager's Guide* for more information on these programs. To get line printer spooling, you need all of these programs except BATCH. To get batch spooling, you need all of these programs except SPOOL and/or SPL. You need BATCH, OPSER, QUEMAN, and either SPOOL or SPL to get both line printer and batch spooling.
- Two to five jobs if your installation uses dial-up terminals, because these terminals may become detached as a result of a faulty phone connection.
- A number of detached jobs for optional software like DECWORD/DP and DECnet/E. See the appropriate installation guides.

The example installation calculates a total of 27 jobs:

- Terminals – 14
- Pseudo keyboards – 8
- System programs – 5 (for line printer spooling)

Figure 4 provides a job calculation worksheet to allow you to write the number of jobs needed by your installation. The maximum number of jobs allowed by the RSTS/E monitor is 63.

How many terminals do you plan to support?	________
How many pseudo keyboards do you have?	________
How many detached jobs do you need for these system programs: BATCH, OPSER, SPOOL, QUEMAN, ERRCPY?	________
How many jobs do you need to accommodate your dial-up terminals?	________
How many detached jobs do you need for optional software?	________
Total # of jobs	________

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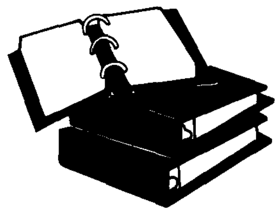
Figure 4: Job Calculation Worksheet

Go to Task 7.

Task 7: Calculate SWAP MAX

In addition to calculating the number of jobs, you also need to calculate the SWAP MAX before further preparing your disks. This task explains how to calculate the SWAP MAX. You need to know the SWAP MAX to create your swap files (described in Task 9 of this phase). There is no terminal session in this task, only a preparation session.

Preparation Session



The RSTS/E monitor constantly moves jobs from memory to disk. For a job to move to disk, a special file must exist to store the job. This file is called a *swap file*. The *SWAP MAX* or swap maximum is the maximum amount of disk storage space that a job can occupy in a swap file, when the job is swapped from memory to disk during timesharing. The size of your SWAP MAX depends on the run-time systems you plan to use, as different run-time systems allow different sizes for user jobs.

For example, BASIC–PLUS might be your primary run-time system, which means the SWAP MAX should be 16K. However, you might need to run a FORTRAN program that uses the RT11 run-time system. The FORTRAN program can have a maximum size of 28K. The SWAP MAX values for the RSTS/E run-time systems are:

- BASIC–PLUS – 16K or 28K words
- RT11 – 28K words
- RSX – 28K or 32K words

Figure 5 provides a SWAP MAX calculation worksheet. Circle the SWAP MAX needed for your installation.

In the example installation, RSX is an available run-time system; therefore, the SWAP MAX is 32K. DIGITAL recommends you specify 32K if you have the RSX run-time system available because many optional software products require this size. This value gives you an extra 4K of memory for your programs (only if you answer Y to the RSX directives? question in Phase 4; otherwise, 28K is the SWAP MAX). Keep your value for SWAP MAX handy; you will need it in later tasks.

Run-Time System	**SWAP MAX (in K words)**
BASIC–PLUS	16K or 28K*
RT11	28K
RSX	8K or 32K

* If you have more than one disk, you will need the ONLCLN program, which runs under the RT11 run-time system. Therfore, specify 28K as the SWAP MAX.

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Figure 5: SWAP MAX Worksheet

Go to Task 8.

Task 8: List File Status Table (REFRESH LIST)

Now that you have prepared your system disk and any nonsystem disks, your next task is to list the *file status table*. This table lists all the files that can reside in account [0,1] of your system and nonsystem disk. You should list the file status table before and after creating or changing any system files.

You use the LIST suboption of REFRESH (an INIT.SYS option) to list the file status table.

Terminal Session

This terminal session shows the questions asked by REFRESH, explains them, and gives you some possible responses. It also explains how to list the file status table. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the one in the example installation, which is printed in red next to the question.

```
Option: REFRESH
```

Explanation — You stopped here in Task 3 or 5 of this phase.

Response — Type REFRESH or RE.

```
15-DEC-82? (LF)
```

Explanation — REFRESH prints the current date.

Response — Press LINE FEED to accept this date.

```
05:35? AM (LF)
```

Explanation — REFRESH prints the current time.

Response — Press LINE FEED to accept the current time.

```
Disk? DM
```

Explanation — This question asks for the device designator of your system disk.

Response — Possible responses for your system disk are: DK, DL, DM, DP, DR, DB, or DU.

```
Unit? 0
```

Explanation — This question asks for the number of the drive on which your system disk is mounted.

Response — You must answer either 0 or 1. In the example installation, the system disk is mounted on drive 0.

```
Rebuild? NO
```

Explanation — This question asks if you want to force a rebuild of a disk that you think might be corrupt. The *rebuild* feature of REFRESH rebuilds the SATT.SYS file and checks the consistency of directories. Normally, you rebuild a disk if it was dismounted improperly. You usually do not have to rebuild the disk during system generation.

Response — Type YES to rebuild the disk; type NO if you do not want to rebuild the disk. In the example installation, the response is NO.

```
REFRESH suboption? LIST
```

Explanation — You are now finished with the questions asked by REFRESH and are at the REFRESH suboption? prompt. Now you can list the file status table for the system disk.

Response: Type LIST or LI.

```
  File                    File         Current  Minimum    Start
  Name       Required?    Flags Status   Size     Size      LBN

System files:

  SWAP   .SYS    YES              CRE               64
  SWAP0  .SYS     NO              OK
  SWAP1  .SYS     NO              OK
  SWAP3  .SYS     NO              OK
  OVR    .SYS     NO              OK
  ERR    .SYS     NO              OK                16
  BUFF   .SYS     NO              OK
  CRASH  .SYS     NO              OK

Others:

  BADB   .SYS             NOD             0
  SATT   .SYS         NOD CTG             2             13541
  INIT   .SYS         NOD CTG           535               241
  ERR    .ERR             CTG            16               777
  SYSGEN.SIL              CTG           382               793
  RT11   .RTS             CTG            20              1177

  REFRESH suboption? (LF)

Option:
```

Explanation — LIST prints the file status table, which has seven columns:

- File Name – This column lists all of the files that can or currently reside in account [0,1]. The table lists the files in two categories: System Files and Others.
- Required? – This column has two possible entries: YES, which means the files are required for the operation of the current monitor; NO, which means the files are not required for the operation of the current monitor. This column is always blank for nonsystem files, which are listed under the Others column. Note that for the example installation, the file status table shows that the SWAP.SYS file is the only required file. Because you have not yet installed a monitor, the file status table cannot give you an accurate list of required files. The planning session in Task 9 of this phase explains how to determine what system files you need to create.
- File Flags – This column has two possible entries: NOD, which means you cannot delete the file during timesharing; CTG, which means the file is contiguous on the disk.
- Status – This column has three possible entries: OK, which means you do not have to change the file's characteristics; CRE, which means you must create the file; D/C, which means you must delete and then recreate the file.
- Current Size – This column shows the current file size in blocks. If the column is blank, it means the file has not been created. The column also shows the current size of the nonsystem files.
- Minimum Size – This column shows the minimum sizes, in blocks, of the system files.
- Start LBN – This column shows the logical block number n at which each contiguous file starts. Disk logical blocks are numbered from 0 to the disk size – 1. If the column is blank, it means either the file is not contiguous, or if it is contiguous, it might be extended and become noncontiguous.

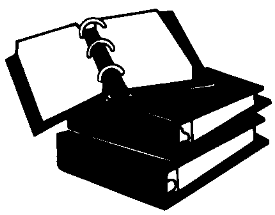
Response — After LIST prints the file status table, it returns to the REFRESH suboption? prompt. You can now list the file status table for any nonsystem disks by pressing LINE FEED to this question and by typing REFRESH to the Option: prompt. Follow the instructions presented in this task, but this time specify the unit number of the drive your nonsystem disk is on when you come to the Unit? question. The example installation does not show the file status table for the nonsystem disk; therefore, the response in the example installation is LINE FEED. LIST returns to the Option: prompt.

Go to Task 9.

Task 9: Create System Files (REFRESH CHANGE)

After you list the file status table, your next task is to create the required system files and any optional system files you may need. This task is divided into a planning session and a terminal session. The planning session explains what system files you need to create, how to estimate their sizes, and where to locate them on the disk. The terminal session explains how to use the CHANGE suboption of REFRESH to create these system files.

Planning Session



System files need contiguous space on the disk, which means they must be stored on a free area of the disk. During system generation, many files are allocated to the system disk, and space on that disk may become fragmented. This fragmentation may prevent you from allocating system files of sufficient length. For example, you may need a SWAP.SYS file of 3,100 blocks. If the disk becomes fragmented and 3,100 blocks of contiguous space is not available, you will see the error message: Unable To Create Requested Files.

Thus, it is better to create system files when there is sufficient contiguous space on the disk. (If you initialized a nonsystem disk, you can create some of these files on the nonsystem disk, freeing space on the system disk.) Do not worry about making these system files too large; you can always reduce their sizes in Phase 7.

This planning session explains how to create the following system files:

- SWAP.SYS
- SWAP0.SYS
- SWAP1.SYS
- SWAP3.SYS
- OVR.SYS
- ERR.SYS
- BUFF.SYS
- CRASH.SYS

Table 7 shows the system files, whether they are required or optional, where they should be located, and a formula for calculating the size. The following sections explain this table in more detail.

Table 7: Summary of System File Creation

System File	Status	Location	Size
SWAP.SYS	Required	Center of system disk	# of jobs * SWAP MAX * 4
SWAP0.SYS	Optional	Center of system or nonsystem disk	# of highly interactive jobs * SWAP MAX * 4
SWAP1.SYS	Optional	Center of system or nonsystem disk	# of highly interactive jobs * SWAP MAX * 4
SWAP3.SYS	Optional	Center of system or nonsystem disk	# of event-driven jobs * SWAP MAX * 4
OVR.SYS	Optional	Center of system or nonsystem disk	Allocate maximum of 182 blocks. Reduce later in Phase 7.
ERR.SYS	Optional	Center of system or nonsystem disk	16
BUFF.SYS	Required for TU56 DECtapes	System disk	4 blocks * # of TU56 DECtapes
CRASH.SYS	Required if you enable crash dump	System disk	Size of XBUF * 4 plus 140

Planning the SWAP.SYS File

Definition — The *SWAP.SYS file* is one of four available swap files, which stores jobs transferred out of memory.

Status — The SWAP.SYS file is required. Without this file, the monitor cannot swap jobs out of memory; your system will not work.

Location — The SWAP.SYS file should be located at the center of the system disk.

Size — The size of the SWAP.SYS file is:

# of jobs * SWAP MAX * 4

You calculated the number of jobs and the SWAP MAX in Tasks 6 and 7 in this phase. If you anticipate future growth, you should create SWAP.SYS at a size that is large enough to serve your future needs. (You may need to increase the total number of jobs you calculated in Task 6 of this phase.)

If you have only a system disk and no nonsystem disks, create SWAP.SYS at the maximum size on your system disk. You do not need to create the optional swap files because they would take up a large amount of space.

If you have a system disk and one or more nonsystem disks, create SWAP.SYS at the maximum size on your system disk. Then, consider creating some optional swap files. This way, if a disk drive breaks, your monitor will still be able to swap jobs out of memory. In the example installation, a SWAP.SYS file will be created at the center of the system disk at the size:

Total Number of Jobs (27) * SWAP MAX (32K) * 4 = 3,456 blocks.

Planning the SWAP0.SYS and SWAP1.SYS Files

Definition — The SWAP0.SYS and SWAP1.SYS swap files perform the same function as SWAP.SYS. The monitor uses these two files to store *highly interactive jobs*—jobs that get transferred in and out of memory frequently. A terminal is an example of a highly interactive job.

Status — SWAP0.SYS and SWAP1.SYS are optional system files.

Location — These files are usually located at the center of a nonsystem disk.

Reasons for Creating — Create either one of these files if you have a system and a nonsystem disk. There is no point in having either of these files on the system disk. When the monitor transfers a highly interactive job out of memory, it places the highly interactive job in the first available space in a swap file, starting with SWAP0.SYS. If it does not find any space (or SWAP0.SYS does not exist), the monitor looks for space on SWAP1.SYS, then SWAP.SYS, then SWAP3.SYS. Thus, you can increase the speed of swapping highly interactive jobs by creating either SWAP0.SYS or SWAP1.SYS at the center of the nonsystem disk.

The example installation has a system and a nonsystem disk. Therefore, it will create SWAP0.SYS at the center of the nonsystem disk at the size:

Estimated # of highly interactive jobs (15) * SWAP MAX (32K) * 4 = 1,920 blocks

This means that the monitor will swap the highly interactive jobs to SWAP0.SYS first (as long as the number of highly interactive jobs does not exceed 15), before it swaps them to SWAP.SYS, thus making the system disk available for other tasks.

Planning the SWAP3.SYS File

Definition — SWAP3.SYS is a swap file that performs the same function as SWAP.SYS. The monitor uses this file to store *event-driven jobs*—jobs that do not get transferred in and out of memory frequently. Examples of event-driven jobs are QUEMAN, ERRCPY, OPSER, and SPOOL.

Status — The SWAP3.SYS file is an optional system file.

Location — This file is usually located at the center of a nonsystem disk.

Reasons for Creating — You would create SWAP3.SYS if you have a system and a nonsystem disk. There is no point in creating this file on the system disk. The monitor uses a different method to swap event-driven jobs than it does for highly interactive jobs. Instead of starting with SWAP0.SYS, the monitor places the event-driven job in the first available space starting with SWAP3.SYS. If it does not find any space, the monitor looks for space on SWAP.SYS, then SWAP1.SYS, then SWAP0.SYS. Thus, you can speed up the swapping of event-driven jobs by creating SWAP3.SYS at the center of the nonsystem disk.

The example installation has a system and a nonsystem disk. Therefore, it will create SWAP3.SYS at the center of the nonsystem disk at the size:

Estimated # of event-drive jobs (12) * SWAP MAX (32K) * 4 = 1,536 blocks

The monitor will swap the event-driven jobs to SWAP3.SYS first (as long as the number of event-driven jobs does not exceed 12), before it swaps them to SWAP.SYS, making the system disk available for other tasks.

Table 8 shows the amount of time in seconds needed to transfer different size job images for different disks. Use this information to create swap files on the disks that you feel will give you optimum performance.

Table 8: Swap Times

Disk	Job Size			
	8K	16K	28K	31K
RL01/02	.09	.12	.16	.17
RS03/04	.04	.07	.12	.14
RK05	.14	.23	.37	.40
RK06	.08	.11	.17	.18
RK07	.07	.11	.17	.18
RP03	.09	.15	.24	.27
RP04/05/06	.05	.07	.10	.11
RM02	.05	.07	.10	.11
RM03/05	.04	.06	.08	.08
RA80/RM80/ RM60/RA81	.04	.05	.07	.07

Note

The swap times for each disk were calculated using the formula:

Time = Average seek time + (Transfer rate * Job size)

The average seek time and transfer rate for each disk are in the *PDP–11 Peripherals Handbook.*

Planning the OVR.SYS File

Definition — The *OVR.SYS file* can store a copy of certain parts of the currently installed monitor save image library (SIL).

Status — You do not need to create OVR.SYS; it is an optional system file.

Location — You can create OVR.SYS on either the system or nonsystem disk. You should locate OVR.SYS as close as possible to the center of the disk, so that the monitor can access it quickly. In the example installation, OVR.SYS will be created on the nonsystem disk.

Reasons for Creating OVR.SYS — OVR.SYS stores part of the monitor code that is located in the installed monitor SIL. Your RSTS SIL may be located at the beginning of the disk rather than at the center. Files are more quickly accessed when they are located in the center of the disk. You cannot move the monitor SIL file, but you can locate OVR.SYS near the center of the disk. Thus, when the monitor needs to access the installed monitor SIL code, it will access OVR.SYS instead of the installed monitor SIL file, thereby increasing performance.

Size — You cannot determine the size of OVR.SYS at this point; therefore, you should specify the maximum of 182 blocks. You can reduce this size in Phase 7. In the example installation, the OVR.SYS file will be created at the maximum size of 182 blocks and reduced later in Phase 7.

Planning the ERR.SYS File

Definition — The *ERR.SYS file* stores a copy of the system error messages, which are located in the ERR.ERR file. You copied ERR.ERR to your system disk in Task 3 of this phase.

Status — You do not need to create ERR.SYS; it is an optional system file.

Location — Create ERR.SYS on a nonsystem disk if you have one. Otherwise, create ERR.SYS on the system disk. Locate ERR.SYS as close as possible to the center of the system or nonsystem disk to improve access and response time.

Reasons for Creating ERR.SYS — ERR.SYS is merely a copy of ERR.ERR, but ERR.ERR may be located at the beginning of the disk rather than at the center. Files are more quickly accessed when they are located in the center of the disk. You cannot move ERR.ERR, but you can locate ERR.SYS as close to the center of the disk as possible. Thus, when the monitor needs to access system error messages, it will access ERR.SYS instead of ERR.ERR, thereby increasing system performance.

Size — ERR.SYS should be the same size as ERR.ERR, which is currently 16 blocks.

Planning the BUFF.SYS File

Definition — The *BUFF.SYS file* stores the DECtape buffers.

Status — You must create this file if your RSTS/E monitor will support one or more TU56 DECtapes.

Location — You must create BUFF.SYS in the center of your system disk.

Size — The size of this file depends on how many TU56 DECtapes you plan to support. Allocate three blocks for each TU56 DECtape.

In the example installation, there are no TU56 DECtapes. Thus, the example installation will not create BUFF.SYS

Planning the CRASH.SYS File

Definition — The *CRASH.SYS file* stores information about the read/write area of the monitor and the extended buffer pool (often called XBUF) when a system crash occurs.

Status — You must create CRASH.SYS if you plan to enable the crash dump feature. This feature causes the read/write area of the monitor and the extended buffer pool to be dumped into CRASH.SYS when a system crash occurs. (The crash dump feature will be explained in more detail in Phase 7.)

Location — You must create CRASH.SYS on the system disk; its location on the system disk is not important.

Size — Use the following to estimate the size of CRASH.SYS:

Estimated size of XBUF * 4 plus 140

To estimate the size of the extended buffer pool (XBUF):

Multiply 10% times your CPU size (if you have a small system)
Multiply 15% times your CPU size (if you have a large system)

In the example installation, the estimated size of XBUF is:

10% * 124K = 12.4K

To find out how many blocks this is use the formula:

(Size of XBUF in K words * 4) + 1

Therefore the example installation will specify 288 blocks for CRASH.SYS. You can increase or decrease this size in Task 3 of Phase 7.

The following summarizes the system files created for the example installation:

System File	Size (in blocks)	Location
SWAP.SYS	3456	System Disk: 11813
SWAP0.SYS	1920	Nonsystem Disk: 11714
SWAP1.SYS	Not Created	
SWAP3.SYS	1536	Nonsystem Disk: 11714
OVR.SYS	182	Nonsystem Disk: 11714
ERR.SYS	16	Nonsystem Disk: 11714
BUFF.SYS	Not Created	
CRASH.SYS	288	System Disk

Figure 6 provides a system file creation worksheet that allows you to write the sizes and locations of the system files you need to create. Note the formula for calculating the center of the disk for these files:

FORMULA FOR LOCATION:

$$\text{(STARTING LBN FOR SATT.SYS)} - \left(\frac{\text{X TOTAL BLOCKS}}{2}\right) = \text{STARTING LOCATION OF FILES}$$

where:

STARTING LBN FOR SATT.SYS	is the starting logical block number for the SATT.SYS file. You can find this by looking at the file status table in the LBN column. You told DSKINT to locate SATT.SYS in the center of the disk when you pressed LINE FEED to the SATT.SYS base? question.
X TOTAL BLOCKS	is the total number of blocks for the system files you want to create on that disk.

You need not total CRASH.SYS and BUFF.SYS because their location on the disk is not important.

For example, to locate SWAP.SYS in the center of the system disk, the example installation uses:

$$13541 \text{ (Starting LBN of SATT.SYS)} - \left(\frac{3456 \text{ (Size of SWAP.SYS)}}{2}\right) = 11813$$

To locate the optional system files on the nonsystem disk, the example installation uses:

$$13541 - \left(\frac{3654}{2}\right) = 11714$$

System File	Size (in blocks)	Location
SWAP.SYS	________	________
SWAP0.SYS	________	________
SWAP1.SYS	________	________
SWAP3.SYS	________	________
OVR.SYS	________	________
ERR.SYS	________	________
BUFF.SYS	________	________
CRASH.SYS	________	________

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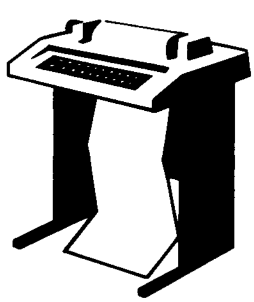
Figure 6: System File Creation Worksheet

Terminal Session



Now that you have planned the system files you need, use the CHANGE suboption of REFRESH to create them. This terminal session lists the questions that CHANGE asks, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. Keep your System File Creation Worksheet (Figure 6) handy.

```
Option: REFRESH
15-DEC-82? (LF)
05:33 AM? (LF)
Disk? DM
Unit? 0
Rebuild? NO

  REFRESH suboption? CHANGE
```

Explanation — To create your system files, use the CHANGE suboption of REFRESH. You answer the same questions that appeared when you listed the file status table. In the example installation, the SWAP.SYS, BUFF.SYS, and CRASH.SYS files will be created on the system disk; therefore, the answer to the unit question is 0.

```
SWAP.SYS changes? YES
```

Explanation — This question asks if you want to create SWAP.SYS.

Response — Type YES.

```
Size? 27*32K
```

Response — Type the size of your SWAP.SYS file, which you calculated using the System File Creation Worksheet. Or, simply type the formula to have CHANGE calculate the number of blocks. In the example installation, the response is 27*32K.

```
Base? 11813
```

Response — Type the logical block number where you want to locate SWAP.SYS; you calculated this using the System File Creation Worksheet. In the example installation, the response is 11813.

```
SWAP0.SYS changes? NO
```

Explanation — This question asks if you want to create SWAP0.SYS. Because the example installation plans to create this file on the nonsystem disk, the answer is NO.

```
SWAP1.SYS changes? NO
```

Explanation — This question asks if you want to create SWAP1.SYS. Because the example installation plans not to create this file, the response is NO.

```
SWAP3.SYS changes? NO
```

Explanation — This question asks if you want to create SWAP3.SYS. Because the example installation plans not to create this file, the response is NO.

```
OVR.SYS changes? NO
```

Explanation — This question asks if you want to create OVR.SYS. Because the example installation plans to create this file on the nonsystem disk, the answer is NO. Type YES if you want to create this file on your system disk. Enter the size and location values from the System File Creation Worksheet to the Size? and Base? questions that follow (not shown here).

```
ERR.SYS changes? NO
```

Explanation — This question asks if you want to create ERR.SYS. Because the example installation plans to create this file on the nonsystem disk, the response is NO. Type YES if you want to create this file on your system disk. Enter the size and location values from the System File Creation Worksheet to the Size? and Base? questions that follow (not shown here).

```
BUFF.SYS changes? NO
```

Explanation — This question asks if you want to create BUFF.SYS. Because the example installation plans not to create this file, the response is NO. Type YES if you want to create this file on your system disk. Enter the size and location values from the System File Creation Worksheet to the Size? and Base? questions that follow (not shown here).

```
CRASH.SYS changes? YES
```

Explanation — This question asks if you want to create CRASH.SYS.

Response — Type YES if plan to create this file; otherwise, type NO.

```
Size? 288
```

Response — Type the size you calculated on the System File Creation Worksheet. The response is 288 in the example installation.

```
Base? (LF)
```

Response — Type LINE FEED to let CHANGE find a location. It is not important to locate this file near the center of the disk.

```
Other files? NO
```

Explanation — This question asks if you need to create files of your own.

Response — Type YES if you need to create your own files; otherwise, type NO, as in the example installation.

```
REFRESH suboption? (LF)
```

Explanation — Type LINE FEED to return to the Option: prompt. If you have no nonsystem disks, go to Task 10. If you want to create files on the nonsystem disk, continue with this task.

```
Option: REFRESH
15-DEC-82? (LF)
05:36 AM? (LF)
Disk? DM
Unit? 1
Rebuild? NO

  REFRESH suboption? CHANGE
```

Explanation — To create system files on your nonsystem disk, use the CHANGE suboption of REFRESH. Answer the same questions as before, but this time specify the unit number of the drive your nonsystem disk is on to the Unit? question. In the example installation, the SWAP0.SYS, SWAP3.SYS, OVR.SYS, and ERR.SYS will be created on the nonsystem disk.

```
SWAP.SYS changes? NO
```

Response — Type NO; you can only create this file on the system disk.

```
SWAP0.SYS changes? YES
```

Explanation — This question asks if you want to create SWAP0.SYS.

Response — Type YES to create this file, as in the example installation. Type NO if you do not want to create this file. CHANGE then skips the next two questions.

```
Size? 15*32K
```

Response — Type the size of SWAP0.SYS, which you calculated using the System File Creation Worksheet. Or, type the formula if you want CHANGE to calculate the number of blocks for you. In the example installation, the response is 15*32K.

```
Base? 11714
```

Response — Type the location of SWAP0.SYS, which you calculated using the System File Creation Worksheet. The response is 11714 in the example installation.

```
SWAP1.SYS changes? NO
```

Explanation — This question asks if you want to create SWAP1.SYS. Because the example installation plans not to create this file, the response is NO. Type YES if you want to create this file. Enter the size and location values from your System File Creation Worksheet to the appropriate questions.

```
SWAP3.SYS changes? YES
```

Response — Type YES if you want to create SWAP3.SYS; otherwise, type NO. CHANGE then skips the next two questions.

```
Size? 12*32K
```

Response — Type the size of SWAP3.SYS, which you calculated using the System File Creation Worksheet. Or, type the formula if you want CHANGE to calculate the number of blocks for you. In the example installation, the response is 12*32K.

```
Base? 11714
```

Response — Type the location of OVR.SYS, which you calculated using the System File Creation Worksheet. The response is 11714 in the example installation.

```
OVR.SYS changes? YES
```

Response — Type YES if you want to create this file; type NO if you do not want to create this file. If you type NO, CHANGE skips the next two questions.

```
Size? 182
```

Response — Type the size of OVR.SYS, which you calculated using the System File Creation Worksheet. The maximum size of this file is 182 blocks, which is the response in the example installation.

```
Base? 11714
```

Response — Type the location of OVR.SYS, which you calculated using the System File Creation Worksheet. The response is 11714 in the example installation.

```
ERR.SYS changes? YES
```

Response — Type YES if you want to create ERR.SYS. Type the size and location values from the System File Creation Worksheet to the following two questions. Note the responses in the example installation. Or, type NO, in which case CHANGE skips the next two questions.

```
Size? 16

Base? 11714

BUFF.SYS changes? NO
```

Explanation — Type NO; this file can be created only on the system disk.

```
CRASH.SYS changes? NO
```

Explanation — Type NO; this file can be created only on the system disk.

```
Other files? NO
```

Explanation — This question asks if you need to create files of your own.

Response — Type YES if you need to create your own files; otherwise, type NO, as in the example installation.

```
REFRESH suboption? (LF)
```

Explanation — CHANGE returns to the REFRESH suboption prompt. Press LINE FEED to return to the Option: prompt.

Note

After you complete system generation and start timesharing, you must use the UTILTY program to add your swapping files and any other system files you created in this phase. The *RSTS/E System Manager's Guide* has instructions on how to add these files.

Go to Task 10.

Task 10: List File Status Table (REFRESH LIST)

Now that you have created your system files, list the file status table again. The example installation shows the tables for the system disk and the nonsystem disk. Note the values in the different columns of the tables. The starting logical block number (LBN) may not be the exact number you entered because CHANGE locates the file as close to the center as possible.

```
Option: REFRESH
15-DEC-82? (LF)
05:45 AM? (LF)
Disk? DM
Unit? 0
Rebuild? NO

  REFRESH suboption? LIST


  File                     File         Current  Minimum    Start
  Name        Required?  Flags Status    Size      Size       LBN

System files:

  SWAP   .SYS     YES      NOD CTG  OK     3456       64       14001
  SWAP0  .SYS     NO                OK
  SWAP1  .SYS     NO                OK
  SWAP3  .SYS     NO                OK
  OVR    .SYS     NO                OK
  ERR    .SYS     NO                OK                16
  BUFF   .SYS     NO                OK
  CRASH  .SYS     NO       NOD CTG  OK      288                 1197

Others:

  BADB   .SYS                  NOD            0
  SATT   .SYS              NOD CTG            2                13541
  INIT   .SYS              NOD CTG          535                  241
  ERR    .ERR                  CTG           16                  777
  SYSGEN.SIL               NOD CTG          382                  793
  RT11   .RTS                  CTG           20                 1177

  REFRESH suboption? (LF)

Option: REFRESH
15-DEC-82? (LF)
05:46 AM? (LF)
Disk? DM
Unit? 1
Rebuild? NO

  REFRESH suboption? LIST
```

(continued on next page)

```
File                       File          Current  Minimum    Start
Name        Required?  Flags Status   Size     Size      LBN

System files:

 SWAP   .SYS     NO               OK
 SWAP0  .SYS     NO     NOD CTG   OK     1920                  14001
 SWAP1  .SYS     NO               OK
 SWAP3  .SYS     NO     NOD CTG   OK     1536                  15861
 OVR    .SYS     NO     NOD CTG   OK      182                  11869
 ERR    .SYS     NO     NOD CTG   OK       16       16         12053
 BUFF   .SYS     NO               OK
 CRASH  .SYS     NO               OK

Others:

 BADB   .SYS                NOD            16
 SATT   .SYS            NOD CTG             2                  13541

 REFRESH suboption? (LF)
```

> Go to Phase 3.

> There are two more file-related tasks that you might need to perform: Changing Account [0,1] File Characteristics and Expanding the Bad Block File. (These tasks are associated with the REFRESH option of INIT.SYS.) Usually, you perform these tasks during day-to-day system management. If you need to perform these tasks, go to the file-related tasks, located in the conditional tasks section of this manual.
>
> If you do not have to perform these tasks, then go to Phase 3.

Table 9: REFRESH Error Messages

Message and Meaning
`CANNOT REFRESH THIS DISK` Rerun DSKINT and then try REFRESH again.
`CANNOT CHANGE OR MOVE .RTS OR .SIL WITH REFRESH` You cannot move or change any files with a .RTS or .SIL file type.
`ILLEGAL DISK NAME` The response you typed is not a valid disk name. Valid disk names are DK, DL, DM, DP, DR, DB, and DU. Press LINE FEED to use the system disk.
`ILLEGAL SUBOPTION` The response you typed was not a valid suboption name.

(continued on next page)

Table 9: REFRESH Error Messages (Cont.)

Message and Meaning
`SORRY, BUT THAT DISK DOESN'T EXIST` The disk device or unit number you specified does not exist on this PDP–11. Use the HARDWR option to list the hardware configuration.
`THAT FILE CANNOT BE CHANGED` You cannot modify the file.
`THAT FILE IS THE CURRENTLY INSTALLED SIL AND CANNOT BE MOVED OR DELETED` You cannot move or delete the installed monitor SIL.
`TOO MANY BAD BLOCKS` There can be no more than 161 clusters in the bad block file.
`UNABLE TO CREATE REQUESTED FILE(S)` The disk does not contain enough contiguous space at the specified bases to create the specified files. Try again, using different bases or smaller files.

Phase 3
Tailor SYSGEN Monitor

DIGITAL supplies a prebuilt RSTS/E monitor, called the SYSGEN monitor, on the distribution tape or disk. The SYSGEN monitor is a temporary monitor; you use it only to build your RSTS/E monitor. (Phase 6 describes how to shut down the SYSGEN monitor when it is no longer needed.) The tasks for tailoring your SYSGEN monitor are:

- Task 1: Install SYSGEN Monitor (INSTALL)
- Task 2: Establish SYSGEN Monitor Defaults (DEFAULT)

> You may have to perform two hardware-related tasks if you have hardware that has nonstandard CSR addresses or nonstandard vector assignments. If so, go to either Declare a Nonstandard Controller Address (CSR) or Declare a Nonstandard Vector Assignment (VECTOR). These tasks are located in the hardware-related tasks section of the Conditional Tasks.
>
> If your installation does not require you to perform any of these tasks, then continue with this phase.

Task 1: Install SYSGEN Monitor (INSTALL)

Your first task is to install the SYSGEN monitor by using the INSTALL option of INIT.SYS.

Terminal Session

To install the SYSGEN monitor, you must answer some questions asked by INSTALL. This terminal session lists the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response printed in red in the example installation.

If you want an online explanation, press RETURN after the question. Press CTRL/C to any question to return to the Option: prompt.

The usual INSTALL error messages appear in Table 10. If your error messages do not appear there, see Appendix A.

```
RSTS V8.0 (DMO) INIT V8.0-06

Option: INSTALL
```

Explanation — You stopped here in the last task of the previous phase.

Response — Type INSTALL or IN.

```
Sil? (RET)
```

Explanation — This question asks for the name of your monitor, which is stored in account [0,1] with the file type of .SIL. SIL stands for *save image library*, which is a file that stores the monitor code. Thus, the SYSGEN monitor code is stored in account [0,1] as SYSGEN.SIL. Likewise, your RSTS/E monitor code is stored in this account as RSTS.SIL (or any other name you may choose).

Response — Before you respond with a name, it may be useful to check the monitor or monitors already in account [0,1]. To do this press RETURN after the Sil? question.

```
Type the file name of the monitor save image library.

Directory of all .SIL files in [0,1]:

SYSGEN.SIL

Sil? SYSGEN
```

Explanation — After you press RETURN to the Sil? question, INSTALL prints the online instruction and a directory of all monitors currently in account [0,1]. Because you are building a new RSTS/E monitor and have initialized your system disk, the only monitor currently in account [0,1] is SYSGEN.SIL. This file was copied over to the system disk in Phase 2.

Response — Type SYSGEN, as in the example installation.

```
Sil? SYSGEN

Rebooting...

RSTS V8.0 (DM0) INIT V8.0-06

Option:
```

Explanation — After you type your response, INSTALL takes 30 to 40 seconds to make certain that the SIL you named contains all the necessary modules. If a module is missing or is in an incorrect format, INSTALL prints an error message and returns to the Option: prompt.

If your response is valid, INSTALL scans your hardware configuration, reboots your system disk, and returns to the Option: prompt. Note that INSTALL prints in parentheses the device designator and unit number of the drive your system disk is mounted on.

Go to Task 2.

Table 10: INSTALL Error Messages

Message and Meaning
`FILE NOT FOUND` The installation code did not find the SIL file that you specified in account [0,1] on the system disk.
`ILLEGAL FILE NAME` The file name you typed is not one- to six-alphanumeric characters.
`INVALID SIL FORMAT` The file you specified does not have a valid SIL index block. Make sure you copied from the correct RSTS/E distribution kit. If you still have a problem, contact your DIGITAL software support representative.

Task 2: Establish SYSGEN Monitor Defaults (DEFAULT)

Your next task is to use the DEFAULT option of INIT.SYS to establish SYSGEN monitor defaults for:

- Job and swap maximums
- Run-time system
- Error message file
- Installation name
- Crash dump
- Magnetic tape labeling
- System clock
- Date and time formats
- Power fail delay

Terminal Session

To establish defaults for the SYSGEN monitor, you must answer some questions asked by DEFAULT. This terminal session provides the questions and some brief explanations. You will be asked these same questions in Phase 7, at which time you will be provided with more detailed explanations. Because the SYSGEN monitor requires only minor tailoring, accept the response printed in red in the example installation unless otherwise instructed.

If you want an online explanation, press RETURN after the question. Press CTRL/C to any question to return to the Option: prompt.

The usual DEFAULT dialogue error messages appear in Table 11. If your error messages do not appear there, see Appendix A.

```
Option: DEFAULT
```

Explanation — You stopped here in the previous task.

Response — Type DEFAULT or DE.

```
No defaults are currently set in SYSGEN.SIL

You currently have: JOB MAX = 2, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? NO
```

Explanation — This question asks for the JOB MAX and SWAP MAX for the SYSGEN monitor. You calculated the total number of jobs and the SWAP MAX for your RSTS/E monitor in the previous phase. These totals will be used in later tasks. For now you need not be concerned with the totals because DIGITAL sets the JOB MAX to 2 and the SWAP MAX to 32K for the SYSGEN monitor. You do not have to change the job or swap maximums for the SYSGEN monitor.

Response — Type NO, as in the example installation.

```
Run Time System? RT11
```

Explanation — This question asks for the name of the run-time system of your installed monitor, which at this point in system generation is RT11. All run-time systems reside in account [0,1] on your system disk.

Response — Type RT11, as in the example installation.

```
Error message file? ERR
```

Explanation — This question asks for the name of the default error message file. All error message files reside in account [0,1] of the system disk.

Response — Type ERR, as in the example installation.

```
Installation name? RSTS/E SYSGEN
```

Explanation — This question asks for the name of your installation. This is only a temporary name; you will specify the installation name for your RSTS/E monitor in Phase 7.

Response — Type RSTS/E SYSGEN, or any other name up to 15 characters.

```
Memory allocation table:

  0K: 00000000 - 00203777 (  33K): EXEC
 33K: 00204000 - 00223777 (   4K): RTS (RT11)
 37K: 00224000 - 00757777 (  87K): USER
124K: 00760000 - END             : NXM

Table suboption? EXIT
```

Explanation — After you type the installation name, DEFAULT prints the *memory allocation table*. (Your memory allocation table may differ from the one in the example installation.) This table shows the allocation of each K–word of memory. After printing the table, DEFAULT prints the Table suboption? prompt. This prompt means that you can use any one of the memory allocation table suboptions, which are discussed in detail in the memory allocation-related tasks, located in the Conditional Tasks section of this manual.

Response — You do not need to use any of the memory allocation table suboptions at this point, so type EXIT or EX.

```
Crash dump? YES
```

Explanation — This question asks if you want to enable crash dump.

Response — Type YES, as in the example installation.

```
Magtape labelling default <none>? DOS
```

Explanation — This question asks for the magnetic tape labeling default.

Response — Type DOS, as in the example installation.

```
Preferred clock <P 100>? (LF)
```

Explanation — This question asks for the default system clock.

Response — Press LINE FEED to accept the default within brackets.

```
Date format <ALPHABETIC>? (LF)
```

Explanation — This question asks for the default date format.

Response — Press LINE FEED to accept the default.

```
Time Format <AM/PM>? (LF)
```

Explanation — This question asks for the default time format.

Response — Press LINE FEED to accept the default.

```
Power fail delay <300>? (LF)
```

Explanation — This question asks for the default number of seconds to wait for your hardware to restart before the RSTS/E monitor comes back after a power failure.

Response — Press LINE FEED, as in the example installation.

```
Option:
```

Explanation — After you answer the last question, DEFAULT establishes the defaults for your SYSGEN monitor. Upon completion, DEFAULT returns to the Option: prompt.

Go to Phase 4.

Table 11: DEFAULT Error Messages

Message and Meaning
`FILE NOT CONTIGUOUS` The file you specified is not contiguous on the disk. The primary run-time system file and error message file must be contiguous.
`FILE NOT FOUND` The initialization code did not find the file you specified on disk. You may have typed the file name incorrectly. Try typing the correct file name.
`ILLEGAL FILE NAME` The file name you specified is not one- to six-alphanumeric characters. Specify the correct file name.
`INVALID FILE FORMAT` The error message file you specified is not exactly sixteen blocks long. Make sure you copied from the correct RSTS/E distribution kit.
`INVALID MODULE FORMAT` The run-time system SIL module is too long, too short, or has an upper limit other than 177776(8). Make sure you copied from the correct RSTS/E distribution kit.
`INVALID SIL FORMAT` The run-time system file does not contain a valid SIL index. Make sure you copied from the correct RSTS/E distribution kit.
`NAME MUST BE 1 TO 15 PRINTABLE CHARACTERS` The installation name you typed is more than 15 characters long or contains unprintable characters. You cannot respond by pressing LINE FEED if no previously typed name is available. Type the installation name, making sure you type no more than 15 characters.
`RTS IS NOT A KEYBOARD MONITOR` The run-time system you specified is not a keyboard monitor. RSTS/E requires the primary run-time system be a keyboard monitor (for example, RT11 for the SYSGEN monitor, BASIC–PLUS or RSX for the RSTS/E monitor). Make sure you copied from the correct RSTS/E distribution kit.
`TOO MANY MODULES` The run-time system SIL contains more than one module. If DIGITAL supplied the run-time system, submit an SPR.

Phase 4
Configure RSTS/E Monitor, Part I

You now have a temporary monitor to use in building your RSTS/E monitor. Unlike the SYSGEN monitor, which comes prebuilt and only requires minor tailoring during system generation, you must build or configure your RSTS/E monitor. To *configure a monitor* means to select the hardware and software it will support. You select the hardware and software by answering *configuration questions*. These questions ask you what hardware (controllers, disk drives, tape drives, and so forth) and software features (RSX directives, extended data buffering, and so forth) your RSTS/E monitor will support.

This phase discusses the tasks you must perform to configure your RSTS/E monitor. In addition, the phase explains how to configure the BASIC–PLUS run-time system. The tasks in this phase are:

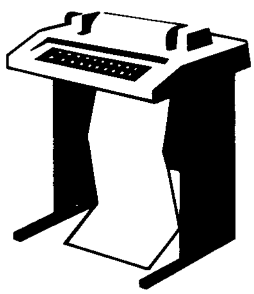
- Task 1: Start SYSGEN Monitor (START)
- Task 2A: Make Sure Distribution Tape is Physically Mounted
- Task 2B: Logically Mount Distribution Disk
- Task 3: Run CREATE.SAV Program
- Task 4: Answer General Configuration Questions
- Task 5: Answer Terminal Interface Configuration Questions
- Task 6: Answer Disk Units Configuration Questions
- Task 7: Answer Peripheral Devices Configuration Questions
- Task 8: Answer Software Tuning and Features Configuration Questions
- Task 9: Answer BASIC–PLUS Configuration Questions

You perform either Task 2A or Task 2B, depending on whether your RSTS/E distribution kit is tape or disk. You perform Task 9 only if you want the BASIC–PLUS run-time system.

Task 1: Start SYSGEN Monitor (START)

Your first task in this phase requires you to start the SYSGEN monitor using the START option of INIT.SYS.

Terminal Session



To start the SYSGEN monitor, you must answer some questions asked by START. This terminal session lists the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response printed in red in the example installation.

If you want an online explanation, press RETURN after the question. Press CTRL/C after any question to return to the Option: prompt.

```
Option: START
```

Explanation — You stopped here in the last task of the previous phase.

Response — Type START or ST.

```
You currently have : JOB MAX = 2, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? (LF)
```

Explanation — START prints the job and swap maximums you established for the SYSGEN monitor. This question lets you change the job and swap maximums for one time-sharing session. However, because you are starting the SYSGEN monitor, you do not need to change any defaults.

Response — Type NO or press LINE FEED.

```
Any memory allocation changes? (LF)
```

Explanation — START asks if you want to make changes to the memory allocation table. This question lets you make changes to the memory allocation table for one time-sharing session. However, because you are starting the SYSGEN monitor you do not need to change the memory allocation table.

Response — Type NO or press LINE FEED.

```
You currently have crash dump enabled.

Crash dump? YES
```

Explanation — START asks if you want to enable crash dump. (The crash dump feature is explained in more detail in Phase 7.)

Response — Type YES to enable crash dump.

```
15-DEC-82? (LF)
```

Explanation — START prints the current date.

Response — Press LINE FEED to accept the current date.

```
06:07 AM? (LF)
```

Explanation — START prints the current time.

Response — Press LINE FEED to accept the current time. START pauses for several seconds (10 to 20 seconds if you are using a UDA type disk) to enable your console terminal and the disk drive your system disk is mounted on. START also:

- Starts the system clock
- Sets up SYSGEN monitor tables
- Loads the SYSGEN monitor and the RT11 run-time system into memory
- Enables memory management

Then it prints a list of disabled devices. In the example installation, the list looks like this:

```
DF0: disabled - no RF: controller
DF0: disabled - unit not present
DS0: disabled - no RS: controller
DS1: disabled - no RS: controller
DS0: disabled - unit not present
DS1: disabled - unit not present
DK0: disabled - no RK: controller
DK1: disabled - no RK: controller
DK2: disabled - no RK: controller
DK3: disabled - no RK: controller
DK0: disabled - unit not present
DK1: disabled - unit not present
DK2: disabled - unit not present
DK3: disabled - unit not present
DP0: disabled - no RP: controller
DP1: disabled - no RP: controller
DP0: disabled - unit not present
DP1: disabled - unit not present
DR0: disabled - no RR: controller
DR1: disabled - no RR: controller
DR0: disabled - unit not present
DR1: disabled - unit not present
DB0: disabled - no RB: controller
DB1: disabled - no RB: controller
DB0: disabled - unit not present
DB1: disabled - unit not present
```

(continued on next page)

```
No RU0: controller
DU0: disabled - unit not present
DU1: disabled - unit not present
DU2: disabled - unit not present
DU3: disabled - unit not present
MT0: disabled - no TM: controller
MT1: disabled - no TM: controller
MS1: disabled - no TS1: controller

33 devices disabled

?Can't find file or account

.
```

Explanation — START prints a list of *disabled devices* — devices that are not physically connected to a particular installation's PDP–11. The monitor automatically disables devices that are not physically connected, thus your list may differ from the one shown here.

In the example installation, the SYSGEN monitor disables 33 devices. Note that DL, DM, and MM are not on this list because they are connected to the example installation's PDP–11.

After printing the list of disabled devices, START transfers control to the installed monitor, which at this time is the SYSGEN monitor. Because the SYSGEN monitor is running under the RT11 run-time system, it attempts to run the INIT.SAV program, which does not yet exist in the system library account. Therefore, it prints the message: ?Can't find file or account. After it prints the message, the SYSGEN monitor prints the period prompt (.). This means that your SYSGEN monitor is now activated and running under the RT11 run-time system.

Go to Task 2A if you have a distribution tape.

Go to Task 2B if you have a distribution disk.

Task 2A: Make Sure Distribution Tape is Physically Mounted

In Phase 1, you physically mounted and bootstrapped your distribution tape, which was either 800 or 1600 bpi. It should still be loaded on drive 0 or 1. Make sure it is online and ready to be accessed. Task 3 requires you to run a program stored on this tape.

Go to Task 3.

Task 2B: Logically Mount Distribution Disk

In Phase 1, you physically mounted and bootstrapped your distribution disk. It should still be loaded on the drive. Make sure it is online and write-protected. You need to logically mount your distribution disk before performing the next task, which requires you to run a program stored on this disk.

Logically Mount Distribution Disk Session

To logically mount this disk, type a command in the form:

```
.MOUNT XXn:XXXXXX/RO
```

where:

.	Is the period prompt displayed when you completed the previous task.
XXn:	Is the device designator and unit number (either 0 or 1) of the drive on which your distribution disk is mounted. A colon must follow the unit number.
XXXXXX	Is the pack ID of your distribution disk. Chapter 3 of the *RSTS/E Release Notes* lists this ID.
/RO	Mounts the disk for read access only. (This prevents accidental destruction of data on the disk.)

Go to Task 3.

Task 3: Run CREATE.SAV Program

Your next task is to run the *CREATE.SAV program*, which is stored on your distribution tape or disk. CREATE.SAV:

- Logs in to account [1,2].
- Executes a command file that runs the PIP.SAV program. PIP.SAV then copies the programs and files needed to build your RSTS/E monitor from the distribution tape or disk to your system disk.

After PIP.SAV copies the required programs, it logically dismounts your distribution disk (if you have a distribution disk) and transfers control to the *SYSGEN.SAV program*, which asks you the configuration questions.

Terminal Session

This terminal session shows how to run CREATE.SAV and explains the output you see on your console terminal.

```
.R XXn:CREATE.SAV
```

Explanation — This is the command format for running CREATE.SAV,

where:

.	Is the period prompt displayed after you completed Task 1 in this phase. Those of you who performed Task 2B in this phase will see the period (.) prompt after you logically mount your distribution disk.
R	Is the command that executes CREATE.SAV.
XXn:	Is the device designator and unit number of the drive your distribution tape or disk is mounted on. A colon must follow the unit number.
CREATE.SAV	Is the program to run.

Response — Type the command, making sure you type the device designator and unit number of the drive your distribution tape or disk is mounted on. In the example installation, the response is MM0: because the distribution tape is mounted on a TE16 tape drive. After you type the command, CREATE.SAV prints a message. Your message may differ from the one that appears in the example installation.

```
.R MMO:CREATE.SAV

^C
HELLO 1/2
Password:
1 other user is logged in under this account

.
.ASSIGN MMO: .DOS

.ASSIGN MMO: IN

.R IN:PIP.SAV
*SY:$*.*<232>=IN:$LOGIN.SAV,$LOGOUT.SAV,$PIP.SAV
*SY:$*.*<104>=IN:$UTILTY.SAV
*SY:$*.*<104>=IN:$MACRO.SAV,$CREF.SAV,$LINK.SAV
*SY:$*.*<104>=IN:$SILUS.SAV,$HOOK.SAV,$SYSGEN.SAV
*SY:$*.*<124>=IN:$SYSBAT.SAV
*SY:$*.*<104>=IN:$ONLPAT.SAV
*DK:$*.*< 40>=IN:$ERR.STB,$PIPSAV.TXT
*SY:[0,1]*.*<40>=IN:$TECO.RTS
*SY:[0,1]*.*/MO:16=SY:[0,1]TECO.RTS
*SY:$*.*<104>/RTS:TECO=IN:$TECO.TEC
*C

.DEASSIGN IN

.DEASSIGN MMO:

.R LOGOUT
Confirm:Y
Saved all disk files; 592 blocks in use
Job 2 User 1,2 logged off KB1 at 15-DEC-82 06:09 AM
System RSTS V8.0-06 RSTS/E SYSGEN
Run time was 6.8 seconds
Elapsed time was 2 minutes
Good morning

**15-DEC-82**

Beginning of RSTS/E system generation.

Questions come in long and short forms.
If you are familiar with them, answer
"S" for short; otherwise, answer "L" for
long form.
```

Explanation — As stated previously, CREATE.SAV enables logins, logs in to account [1,2], and runs the PIP.SAV program, which copies the required programs to your system disk.

After PIP.SAV copies them to the system disk, it logically dismounts the distribution tape or disk and transfers control to SYSGEN.SAV, which displays the configuration questions.

If at any time while answering the questions you want to start over with the first question, press CTRL/C and type R SYSGEN. SYSGEN.SAV starts again with the first question.

Go to Task 4.

Task 4: Answer General Configuration Questions

Now that you have run CREATE.SAV and have copied over the programs and files you need to build your RSTS/E monitor, your next task is to answer the *general configuration questions*. These questions relate to your distribution tape or disk; your output tape or disk; whether you want BASIC–PLUS or RSX as your primary run-time system; and whether you want to apply automatic patches to your RSTS/E monitor, BASIC–PLUS, and RSX run-time systems.

Terminal Session

This terminal session lists the general configuration questions, explains them, and gives you some possible responses (printed in red). After you understand the question, type the response at your console terminal.

SYSGEN.SAV automatically prints answers to the questions it asks. The answers take one of three forms:

- RES – The answer inside the asterisks (RES stands for a response) is the correct response.
- #RES# – The answer inside the pound signs is the default response; however, it might not be the correct response for your installation.
- #??# – The question marks inside the pound signs indicate the program cannot determine the correct response. This always occurs when you answer NO to the Same system? configuration question. It sometimes occurs when SYSGEN.SAV cannot determine the correct response.

Note that SYSGEN.SAV may suggest different responses for your installation than the ones provided in the example installation. You can respond in one of three ways:

- LINE FEED – press LINE FEED to accept the answer inside the asterisks or pound signs.
- RES (RET) – type a response and then press RETURN to override the answer inside the asterisks or pound signs.
- (RET) – press RETURN to print the long form of the question.

```
**15-DEC-82**

Beginning of RSTS/E system generation.

Questions come in long and short forms.
If you are familiar with them, answer
"S" for short; otherwise, answer "L" for
long form.

Form? #S# (LF)
```

Explanation — This question asks you to choose the long or the short form of the online explanations to the questions. If you are a new user, choose the short form and follow the questions as they appear in the manual. (You can always press RETURN to any question for an online explanation.) If you are an experienced user, you may want to skip the explanations in the manual. In most cases, the answers in the manual are not worded the same as the online explanations.

Response — Press LINE FEED if you want the short form; type L if you want the long form. In the example installation, the response is LINE FEED.

```
Same system? #Y# (LF)
```

Explanation — This question asks if you are building a RSTS/E monitor for your PDP–11 or for another PDP–11. If you want to build a RSTS/E monitor for a different PDP–11, type N. If you type N, then SYSGEN.SAV cannot automatically supply answers to the hardware configuration questions. When the program cannot make assumptions about the answers, you will see responses like this: #??#.

Response — Press LINE FEED to build a monitor for this PDP–11; type N to build a monitor for another PDP–11. In the example installation, the response is LINE FEED.

```
Distribution Medium?  #MM# (LF)
```

Explanation — This question asks for the device designator of the tape or disk on which you received the RSTS/E distribution kit.

Response — Type the device designator of the disk on which you received the RSTS/E distribution kit: DK, DL, or DM. You can type SY to this question if you are performing an online system generation to generate a version 8.0 system from another version 8.0 system.

Or, type the device designator of the tape on which you received the RSTS/E distribution kit: MT, if you mounted this tape on a TU10, TE10, or TS03 tape drive; MM, if you mounted this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you mounted this tape on a TS11, TSV05, or TU80 tape drive.

In the example installation, the default response is MM because the CREATE.SAV program was run from the 1600 bpi distribution tape that was mounted on a TE16 tape drive. Thus, LINE FEED is the response. SYSGEN.SAV might suggest a different response for you, depending on what RSTS/E distribution kit you are using.

```
Output medium? #SY# (LF)
```

Explanation — This question asks for the device designator of your system disk.

Response — Press LINE FEED to build the RSTS/E monitor on the system disk. In the example installation, the response is LINE FEED. SYSGEN.SAV skips to the Delete files? question.

Some installations might want to generate a monitor on another disk or magnetic tape. The only requirement is that you previously initialized this disk. Possible responses for disks are: DK, DL, DM, DP, DR, DB, or DU. Do not type DF or DS because you cannot use these as system disks. If you specify a disk, SYSGEN.SAV goes to the Pack ID? question.

MT, MS, or MM are possible responses if you want to generate a monitor onto magnetic tape.

```
Pack ID?
```

Explanation — This question asks for the pack ID of the disk on which you want to build the RSTS/E monitor. It is asked only if you responded with a disk device designator to the previous question.

Response — Type the pack ID of this disk, the ID you specified when you initialized the disk. If you forget the ID you assigned to this disk, check your response to DSKINT's Pack ID? question in Task 2 of Phase 2. In the example installation, there is no response because the answer to the Output medium? question was LINE FEED.

```
Delete Files? #NO# (LF)
```

Explanation — This question asks if you want to delete the system modules (files with types of .OBJ, .LST, .SAV, and .STB) from your system disk. If you are building a RSTS/E monitor on a large disk, you can keep these files without overloading the disk.

If you are building a RSTS/E monitor on a small disk (RL01/RL02), delete these files. This deletion ensures that you have enough room on your system disk to build a RSTS/E monitor.

Response — Press LINE FEED to keep all of these modules; type Y to delete these modules. In the example installation, the response is LINE FEED because the system disk is a large disk.

```
LP for SYSGEN? *NO* (LF)
```

Explanation — This question asks if you want to use the line printer to print system load maps and, optionally, assembly listings of the system tables and terminal service modules.

Response — Press LINE FEED if you do not want to print the system load maps, as in the example installation. You may want to answer LINE FEED to this question because it takes over 30 minutes to print the listings. (You can print the listings during timesharing by using the DCL PRINT command or the QUEMAN system program.)

Type Y to print the system load maps. If you type Y, SYSGEN.SAV prints the Assembly listings? question after it prints the Monitor name? configuration question. (Note that if you answer Y to this question, but a line printer is not available, the load maps will not be deleted from the system disk.)

```
Generate Monitor? #Y# (LF)
```

Explanation — This question asks if you want to generate a RSTS/E monitor.

Response — Press LINE FEED to generate a monitor.

```
Monitor Name? #RSTS# RSTS80
```

Explanation — This question asks for the name of your RSTS/E monitor, which is stored as a save image library (SIL) in account [0,1] on your system disk.

Response — Type a one- to six-character alphanumeric name for your RSTS/E monitor. The default response is RSTS. In the example installation, the response is RSTS80.

```
Assembly listings?
```

Explanation — This question appears only if you typed Y to the LP for SYSGEN? configuration question. It asks if you want to print the assembly listings (TT driver and monitor tables), in addition to the load maps.

Response — The default is Y if you answered YES to the LP for SYSGEN? question. There is no response in the example installation because LINE FEED was the response to the LP for SYSGEN? question.

```
Monitor patching? #??# Y
```

Explanation — This question asks if you want to automatically patch the monitor, using the ONLPAT program. The ONLPAT program and the automatic monitor patches are on the RSTS/E update kit.

Response — DIGITAL recommends you type Y to automatically apply patches to your RSTS/E monitor. In the example installation, the response is Y. If you type Y, you will be asked to mount the RSTS/E update kit in Phase 5. If you do not want to automatically apply patches to the RSTS/E monitor, type N. If you type N, Generate BASIC–PLUS? is the next question.

```
Patch file medium? #MM# (LF)
```

Explanation — This question asks for the device designator of the tape or disk where the monitor patch file resides. DIGITAL distributes the monitor patch file on the RSTS/E update kit.

Response — Type the device designator of the disk on which you received the RSTS/E update kit: DK, DL, or DM.

Or, type the device designator of the tape on which you received the RSTS/E update kit: MT, if you plan to mount this tape on a TU10, TE10, or TS03 tape drive; MM, if you plan to mount this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you plan to mount this tape on a TS11, TSV05, or TU80 tape drive.

In the example installation, LINE FEED is the response because SYSGEN.SAV expects the RSTS/E update tape to be mounted on the same tape drive as the RSTS/E distribution tape. Therefore, SYSGEN.SAV prints the same device designator as it printed in the Distribution medium? question. The program might show a different default for you.

```
Pack ID? #??#
```

Explanation — This question appears only if you typed a disk device designator in the previous question. This question asks for the pack ID of your RSTS/E update kit.

Response — Check Chapter 3 of the *RSTS/E Release Notes* for the pack ID of your RSTS/E update kit. Note that no response is shown in the example installation because the RSTS/E update kit is on tape. (Tapes do not have pack IDs.)

```
Patch file name? #$MONITR.CMD# (LF)
```

Explanation — This question asks for the name of the file that contains the monitor patches.

Response — Press LINE FEED to accept the default response.

```
Generate BASIC-PLUS? #Y# (LF)
```

Explanation — This question asks if you want to generate the BASIC–PLUS run-time system. (See Table 15 in Phase 8 for the advantages and disadvantages of building system programs with BASIC–PLUS as the primary run-time system. After studying that table you might decide to make BASIC–PLUS your auxiliary run-time system and make RSX your primary run-time system. To make BASIC–PLUS your auxiliary run-time system, answer Y to this question and answer Y to the RSX as primary run-time system? question. To make BASIC–PLUS your primary run-time system, answer Y to this question and NO to the RSX as primary run-time system? question.)

Response — Press LINE FEED to generate the BASIC–PLUS run-time system. If you type Y, BASIC–PLUS RTS name? is the next question. In the example installation, the response is LINE FEED.

Type N if you do not want to generate BASIC–PLUS either as a primary or auxiliary run-time system. If you type N, RSX as primary run-time system? is the next configuration question.

```
BASIC-PLUS RTS name? #BASIC# (LF)
```

Explanation — This question asks for a BASIC–PLUS run-time system name. SYSGEN.SAV automatically assigns a file type of .RTS to this name. Your run-time system will be stored as a save image library (SIL) in account [0,1] on your system disk.

Response — Type a one- to six-character alphanumeric name for your BASIC–PLUS run-time system or press LINE FEED to accept the default, as in the example installation.

```
BASIC-PLUS patching? #??# Y
```

Explanation — This question asks if you want to automatically patch the BASIC–PLUS run-time system, using the ONLPAT program. The ONLPAT program and the BASIC–PLUS run-time system patches are on the RSTS/E update kit.

Response — DIGITAL recommends you type Y to automatically apply patches to the BASIC–PLUS run-time system. In the example installation, the response is Y. If you type Y, you will be asked to mount the RSTS/E update kit in Phase 5. Type N if you do not want to apply automatic patches to BASIC–PLUS. If you type N, RSX as primary run-time system? is the next question.

```
Patch File Medium? #Identical to monitor# (LF)
```

Explanation — This question asks for the device designator of the tape or disk on which you received your RSTS/E update kit. Note that the default response is #Identical to monitor#, which means the program expects the patches for both the monitor and BASIC–PLUS run-time system to be on the same tape or disk.

Response — Type the device designator of the disk on which you received your RSTS/E update kit: DK, DL, or DM. If you type a disk device designator, Pack ID? is the next question.

Type the device designator of the tape on which you received the RSTS/E update kit: MT, if you plan to mount this tape on a TU10, TE10, or TS03 tape drive; MM, if you plan to mount this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you plan to mount this tape on a TS11, TSV05, or TU80 tape drive.

In the example installation, the response is LINE FEED.

```
Pack ID?
```

Explanation — This question asks for the pack ID of the disk that contains the BASIC–PLUS run-time system patches.

Response — Check Chapter 3 of the *RSTS/E Release Notes* for the pack ID of the RSTS/E update kit. In the example installation, there is no response because the RSTS/E update kit is on tape. (Tapes do not have pack IDs.)

```
Patch file name? #BASIC.CMD# (LF)
```

Explanation — This question asks for the name of the file that contains the BASIC–PLUS patches.

Response — Press LINE FEED to accept the default response, as in the example installation.

```
RSX as primary run-time system? #NO# Y
```

Explanation — This question asks if you want RSX as your primary run-time system. The RSX run-time system requires only 3K words of memory, in contrast to a minimum of 14K words for BASIC–PLUS. If you do not use the BASIC–PLUS run-time system very often, you can save at least 11K words of memory by installing RSX as your primary run-time system.

You must answer Y to this question if you want RSX as your primary run-time system. If you want RSX as an auxiliary run-time system, answer N to this question. (See Table 15 in Phase 8 for the advantages and disadvantages of building system programs with RSX as your primary run-time system.)

Response — Type Y if you want RSX as your primary run-time system. If you type Y, RSX patching? is the next question. In the example installation, the response is Y. (Unlike the BASIC–PLUS run-time system, the RSX run-time system does not require you to answer any configuration questions other than the ones about patching that follow.)

Type N if you do not want RSX as your primary run-time system. If you type N, DL11A compatible lines? is the next question.

```
RSX Patching? #??# Y
```

Explanation — This question asks if you want to automatically patch the RSX run-time system, using the ONLPAT program. The ONLPAT program and the automatic RSX patches are on the RSTS/E update kit.

Response — DIGITAL recommends you type Y to automatically apply patches to the RSX run-time system. In the example installation, the response is Y. If you type Y, you will be asked to mount the RSTS/E update kit in Phase 5. Type N, if you do not want to apply automatic patches to RSX. If you type N, DL11A compatible lines? is the next question.

```
Patch file medium? #Identical to monitor# (LF)
```

Explanation — This question asks for the device designator of the tape or disk on which you received your RSTS/E update kit. Note that the default response is #Identical to monitor#, which means the program expects the patches for the RSX run-time system to be on the same tape or disk as the monitor and BASIC–PLUS patches.

Response — Type the device designator of the disk on which you received your RSTS/E update kit: DK, DL, or DM. If you type a disk device designator, Pack ID? is the next question.

Type the device designator of the tape on which you received your RSTS/E update kit: MT, if you plan to mount this tape on a TU10, TE10, or TS03 tape drive; MM, if you plan to mount this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you plan to mount this tape on a TS11, TSV05, or TU80 tape drive.

In the example installation, the response is LINE FEED.

```
Pack ID?
```

Explanation — This question asks for the pack ID of the disk that contains the RSX patches.

Response — Check Chapter 3 of the *RSTS/E Release Notes* for the pack ID of the RSTS/E update kit. In the example installation there is no response because the RSTS/E update kit is on tape. (Tapes do not have pack IDs.)

```
Patch file name? #$RSXRTS.CMD# (LF)
```

Explanation — This question asks for the name of the file that contains the RSX patches.

Response — Press LINE FEED to accept the default response, as in the example installation.

```
Now you must specify the hardware configuration on which this RSTS/E
system will run.
```

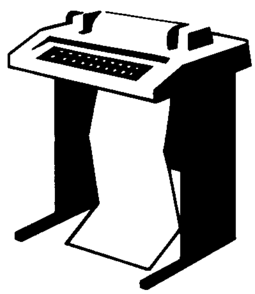
Explanation — SYSGEN.SAV now tells you to answer the hardware configuration questions.

Go to Task 5.

Task 5: Answer Terminal Interface Configuration Questions

Your next task is to answer the *terminal interface configuration questions*. These questions deal with the number and types of hardware that connect your terminals to the PDP–11 and the software features related to these terminals. The RSTS/E monitor can support a maximum of 128 terminals and pseudo keyboards. Therefore, the total number of terminal interfaces and pseudo keyboards cannot exceed 128.

Terminal Session



This terminal session lists the terminal interface configuration questions, explains them, and gives some possible responses (printed in red). After you understand the question, type the response at your console terminal.

Press the ESC key to return to a previous question. (You cannot use the ESC key to return to any of the general configuration questions.) You should use the automatic answers supplied by SYSGEN.SAV when answering these questions, unless you are building a RSTS/E monitor for another PDP–11.

```
DL11A compatible lines? *02* (LF)
```

Explanation — The DL11A single-line interface is a device that allows communication between serial ASCII terminals and your PDP–11. The DL11A single-line interface can connect a terminal either directly to the PDP–11 or indirectly through leased private telephone lines. The RSTS/E monitor can support a maximum of 16 DL11A single-line interfaces.

Response — Type the number (1 to 16) of DL11A single-line interfaces you need to configure. In the example installation, SYSGEN.SAV prints 2 as the number of DL11A compatible lines to configure; thus, LINE FEED is the response. SYSGEN.SAV may display a different answer on your console terminal.

```
DL11C, DL11D's?  *00* (LF)
```

Explanation — The DL11C and DL11D are another class of single-line interfaces that allow communication between serial ASCII terminals and your PDP–11. The DL11C and DL11D single-line interfaces can connect a terminal either directly to the PDP–11 or indirectly through leased telephone lines. Your RSTS/E monitor can support a maximum of 31 DL11C and DL11D single-line interfaces.

Response — Type the number (0 to 31) of DL11C and DL11D single-line interfaces you want to configure. (Do not include as part of your response any DL11Cs or DL11Ds connected to TU58 DECtape controllers.) In the example installation, the program prints 0 as the number of DL11C and DL11D single-line interfaces to enable; thus, LINE FEED is the response. SYSGEN.SAV may display a different answer on your console terminal.

```
DL11E, DLV11E's? *00* (LF)
```

Explanation — The DL11E and DLV11E single-line interfaces connect terminals to the PDP–11. These terminals transfer automatic answer datasets on the dial-up telephone network. The RSTS/E monitor can support a maximum of 31 DL11E and DLV11E single-line interfaces.

Response — Type the number (0 to 31) of DL11E or DLV11E single-line interfaces you need to enable. If you configure more than 31 of any combination of DL11A, DL11C, DL11D, DL11E, or DLV11E single-line interfaces, SYSGEN.SAV returns to the DL11A compatible lines? question.

In the example installation, the program prints 0 as the number of DL11E and DLV11E single-line interfaces to enable; thus, the response is LINE FEED. SYSGEN.SAV may print a different answer on your console terminal.

```
DJ11's? *00* (LF)
```

Explanation — The DJ11 multiplexer can connect 1 to 16 terminals to your PDP–11. A RSTS/E monitor can support a maximum of 16 DJ11 multiplexers.

Response — Type the number (0 to 16) of DJ11 multiplexers attached to your PDP–11.

In the example installation, the number of DJ11 multiplexers is 0; thus, LINE FEED is the response. SYSGEN.SAV may print a different answer on your console terminal. If you type 0, SYSGEN.SAV skips the next question and goes to the DH11's? question.

```
DJ11 unit xx lines enabled?
```

Explanation — This question appears for each DJ11 multiplexer supported by your RSTS/E monitor. For example, if you typed 3 to the previous question, this question would appear three times. (The manual shows this question only once.)

Response — Type the number (0 to 16) of lines you need to enable for this DJ11 multiplexer. DIGITAL recommends you configure the maximum number of lines, if you have enough memory, and you do not exceed the maximum of 128 lines. Because the example installation does not support any DJ11 multiplexers, there is no response to this question.

```
DH11's? *01* (LF)
```

Explanation — The DH11 multiplexer can connect 1 to 16 terminals to your PDP–11. A RSTS/E monitor can support a maximum of 16 DH11 multiplexers.

Response — Type the number (0 to 16) of DH11 multiplexers attached to your PDP–11. In the example installation, the program prints 1 as the number of DH11 multiplexers to enable; thus, LINE FEED is the response. If you type 0, the program skips the next question and goes to the DZ11/DZV11's? question.

```
DH11 unit 00 lines enabled? *16* (LF)
```

Explanation — Type the number (0 to 16) of lines you need to enable for this DH11 multiplexer. SYSGEN.SAV prints this question for each DH11 multiplexer supported by your RSTS/E monitor. For example, if you typed 4 to the previous question, this question appears four times. (The manual shows this question only once.)

Response — Type the number (0 to 16) of lines you want to enable for this DH11 multiplexer. DIGITAL recommends you configure the maximum number, if you have enough memory, and you do not exceed the maximum of 128 lines.

In the example installation, the response is LINE FEED.

```
Dataset support for DH11's? *NO* (LF)
```

Explanation — A DH11 multiplexer can support automatic answer datasets. A DM11–BB modem controller connects a DH11 multiplexer to an automatic answer dataset.

Response — SYSGEN.SAV determines whether your installation has a DM11–BB modem controller. If it does, the default is Y. In this case, type Y or press LINE FEED for dataset support; type N for no dataset support.

In the example installation, SYSGEN.SAV indicates that the DM11–BB modem controller does not exist; therefore, the default is NO and the response is LINE FEED.

```
DZ11/DZV11's? *00* (LF)
```

Explanation — The DZ11 multiplexer can connect one to eight terminals to a RSTS/E Unibus PDP–11; the DZV11 multiplexer can connect one to four terminals to a RSTS/E Q–bus PDP–11.

Response — Type the number (0 to 16) of DZ11 or DZV11 multiplexers attached to your PDP–11. A RSTS/E monitor can support a maximum of 16 DZ11/DZV11 multiplexers.

In the example installation, the program shows that there are no DZ11/DZV11 multiplexers attached to this PDP–11; thus, LINE FEED is the response. SYSGEN.SAV may print a different answer on your console terminal.

If you type 0, the program skips the next question and goes to the Pseudo keyboards? question.

```
Multiplexer type (DZ11/DZV11)?
```

Explanation — This question asks for the type of multiplexer attached to your PDP–11.

Response — Type DZ11 or DZV11, depending on which one is attached to your PDP–11. If you have a PDP–11/23–PLUS, type DZV11. Because neither of these multiplexers is supported in the example installation, there is no response to the question.

```
DZ11/DZV11 unit xx lines enabled?
```

Explanation — This question asks for the number of lines to enable for the DZ11 or DZV11 multiplexer. (Note that this question shows either DZ11 or DZV11, depending on your answer to the previous question.) SYSGEN.SAV prints this question for each DZ11 or DZV11 multiplexer supported by your RSTS/E monitor. For example, if you typed 6 to the DZ11/DZV11's? configuration question, this question appears six times. (The manual shows this question only once.)

Response — Type the number (0 to 8 for DZ11 or 0 to 4 for DZV11) of lines you need to enable for this DZ11 or DZV11 multiplexer. DIGITAL recommends you configure the maximum as long as you have enough memory and as long as you do not exceed the maximum of 128 lines. Because neither of these devices is supported in the example installation, there is no response to this question.

```
Dataset support for DZ11's?
```

Explanation — This question appears only if you answered the previous three questions. (Note that this question shows either DZ11 or DZV11, depending on your answer to the Multiplexer type (DZ11/DZV11)? configuration question.) It asks if you want to connect dial-up telephone lines to a DZ11 or DZV11 multiplexer. The connection is established through an automatic answer dataset, with a modem controller connected to the multiplexer.

There are four models of DZ11s: DZ11–A and DZ11–B, which support partial modem control and, therefore, can support automatic datasets; and DZ11–C and DZ11–D, which do not support modem control and, therefore, cannot support automatic answer datasets.

The DZV11 supports partial modem control and, therefore, can support automatic answer data sets.

Response — Type Y if you have a DZ11–A, DZ11–B, or DZV11 and you want automatic answer dataset support; type N if you do not want automatic answer dataset support, or if you have the DZ11–C or DZ11–D models. Because neither of these multiplexers is supported by the example installation, there is no response to this question.

```
Pseudo Keyboards? #04# 8
```

Explanation — A pseudo keyboard is a logical device that has the characteristics of a terminal, but has no physical terminal associated with it. This question asks you to type the number of pseudo keyboards supported by your RSTS/E monitor. See Figure 4, Job Calculation Worksheet in Phase 2. You should have already figured out how many pseudo keyboards you need.

Response — Type the number (1 to 127) of pseudo keyboards you listed on your Job Calculation Worksheet. In the example installation, the number of pseudo keyboards is 8; thus, 8 is the response.

Note

A RSTS/E monitor permits a maximum of 128 single-line interfaces, enabled multiplexer lines, and pseudo keyboards. (The console terminal is always enabled.) If you configured more than 128 single-line interfaces, multiplexers, and pseudo keyboards, SYSGEN.SAV prints an error message and returns to the DL11A compatible lines? question.

```
2741 support? #NO# (LF)
```

Explanation — This question appears only if you configured one or more DL11D or DL11E single-line interfaces, or one or more DH11, DZ11, or DZV11 multiplexers. It asks if you want to support IBM 2741–compatible terminals and connect them to any combination of these single-line interfaces or multiplexers.

IBM 2741–compatible terminals normally use the RS232 EIA standard connection; thus, they can be connected locally to the PDP–11 through null modems to any of the preceding interfaces or multiplexers. You can also connect these terminals to these interfaces or multiplexers through data sets or acoustic couplers for operation over telephone lines.

Note

To function properly on RSTS/E, an IBM 2741–compatible terminal must have the Transmit Interrupt feature, the Receive Interrupt feature, and the ATTN (or BREAK) key. These features allow the terminal to recognize a reverse break signal from the PDP–11, lock its keyboard, and enter receive mode. Manufacturers of IBM 2741–compatible terminals usually provide these as standard features, but some offer them at additional cost.

Response — Type Y if you want your RSTS/E monitor to support IBM 2741–compatible terminals; type N if you do not want to support these terminals. If you type N, the program goes to the Multi-terminal service? configuration question. In the example installation, the response is LINE FEED.

```
Single line 2741 support?
```

Explanation — This question appears only if you configured one or more DL11D or DL11E single-line interfaces. It asks if you want to connect IBM 2741–compatible terminals to either of these devices.

Response — Type Y if you want to connect IBM 2741–compatible terminals to either the DL11D or DL11E single-line interface. Type N if you do not want to connect this terminal to these devices. In the example installation, there is no response because there are no IBM 2741–compatible terminals.

```
2741 support on DH's?
```

Explanation — This question appears only if you configured one or more DH11 multiplexers. It asks if you want to support IBM 2741–compatible terminals by connecting them to the DH11 multiplexer.

Response — Type Y if you want to connect IBM 2741–compatible terminals to the DH11 multiplexer; type N if you do not want to connect these terminals to this multiplexer. In the example installation, there is no response because there are no IBM 2741–compatible terminals.

```
2741 support on DZ's?
```

Explanation — This question appears only if you configured one or more DZ11s or DZV11s. It asks if you want to connect IBM 2741–compatible terminals to either the DZ11 or DZV11 multiplexer.

Response — Type Y if you want to connect these terminals to either of these multiplexers; type N if you do not want to connect these terminals to either of these multiplexers. This question does not appear in the example installation because there are no IBM 2741–compatible terminals.

```
2741 codes? #NO#
```

Explanation — The RSTS/E monitor supports four code and keyboard arrangements for IBM 2741–compatible terminals: IBM Correspondence Code (CORR), Extended Binary Coded Decimal (EBCD), Standard Binary Coded Decimal (SBCD), and Call 360 BASIC Code (C360). This question asks you to choose from one to four of these codes.

Response — Type the abbreviated code names (CORR, EBCD, SBCD, C360), separated by commas, for the IBM 2741 codes you want your RSTS/E monitor to support. The first code you type becomes the default. For example, if you want the C360 code as your default along with the CORR and EBCD codes, type: C360, CORR, EBCD. Be careful not to configure too many of these codes; otherwise, you may not be able to install your monitor.

In the example installation, there is no response because there are no IBM 2741–compatible terminals.

```
Multi-terminal service? #Y# (LF)
```

Explanation — The multiterminal service feature allows one program to interact simultaneously with several terminals on one input/output channel instead of opening each terminal for input or output.

This feature is useful with applications such as order entry, inventory control, query-response, or any other application where the same function is performed on several terminals. It eliminates the need to run separate copies of the same program at each terminal when several terminals perform a similar function. The procedures for programming multiterminal service are explained in detail in the *RSTS/E Programming Manual.*

Response — Type Y to support this feature; type N if you do not want to support it. In the example installation, the response is LINE FEED.

```
Echo control? #Y# (LF)
```

Explanation — *Echo control* affects the way characters are displayed on the terminal screen. Normally, characters are displayed on the screen just as you type them. This feature lets you use echo control mode in an application program, as described in the *RSTS/E Programming Manual.* In echo control mode, the monitor handles characters differently.

This feature is useful for data entry and other applications where you need to define fixed-length fields for user input, accept input from only one field at a time, define special characters for character deletion sequences within a field, and control the appearance of terminal output. For more information on this feature, see the *RSTS/E Programming Manual.*

Response — Type Y or press LINE FEED to enable this feature; type N if you do not want to enable this feature. In the example installation, LINE FEED is the response.

```
One-line status report? #Y# (LF)
```

Explanation — This question asks if you want the ability to display a one-line status report at your terminal by pressing CTRL/T. The report has the format:

18 REGAL::KB32 SYSTAT+BAS4F C(0R) 11(16)K+16K 3.3(+.5)–8.

The report shows:

- Your current job number (for example, 18)
- The node name of your PDP–11, if you use DECnet/E (for example, REGAL)
- The keyboard number of your terminal (for example, KB32)
- The name of the program or operation you are currently running (for example, SYSTAT)
- The current run-time system name (for example, BAS4F)
- The current job state
- The current program size in words
- The run-time system size in words
- The amount of CPU time in seconds your job has used
- The amount of time the job has run since the last CTRL/T

For more information on this feature, see the *RSTS/E System User's Guide.*

Response — Type Y or press LINE FEED if you want one-line status reports; type N if you do not want these reports.

```
FMS-11 support? #NO# (LF)
```

Explanation — The Forms Management System (FMS–11) is a DIGITAL software product that provides tools for developing forms applications that run only on VT100 or VT52 terminals. If you want to develop forms applications with FMS–11, you must order the FMS–11 Software Kit separately from the RSTS/E distribution kit.

This question asks if you plan to use FMS–11. If so, the RSTS/E code needed to support FMS–11 adds approximately 2K words to the size of your resident monitor.

Response — Type Y to add the RSTS/E code required to support FMS–11. Type N if you plan not to support FMS–11. If you type Y, then you can install FMS–11 in Phase 8, using the instructions in the *FMS–11 Installation Guide*. In the example installation, LINE FEED is the response.

```
Multiple private delimiters? #NO# LF
```

Explanation — A *delimiter* is a character that separates and organizes elements of data. A *private delimiter* is a delimiter used within a program. You can define a letter, a function key such as DELETE, a control character such as CTRL/Z, or even a standard delimiter such as LINE FEED as a private delimiter. A private delimiter is useful on a data entry terminal with a specialized keyboard. You can use a large or conveniently located key as the private delimiter. Private delimiters are also useful in keypad applications.

All RSTS/E monitors support the use of one private delimiter in a program. Answer Y to this question to include support for *multiple private delimiters*. You can declare up to 256 multiple private delimiters in a single program by answering Y to this question and a maximum of 1 by answering NO. Multiple private delimiters allow you to do special character processing without using single character input/output (I/O) strokes. For example, by combining escape sequences with multiple private delimiters, you can define your own function keys in keypad applications. Note that you cannot declare multiple private delimiters in BASIC–PLUS.

For more information on this feature see the *RSTS/E Programming Manual* and the *RSTS/E System Directives Manual*.

Response — If you want your RSTS/E monitor to support multiple private delimiters, type Y; if you do not want your RSTS/E monitor to support these, type N. In the example installation, the response is LINE FEED.

Go to Task 6.

Task 6: Answer Disk Units Configuration Questions

Your next task is to answer the *disk units configuration questions*. These questions deal with the number and types of disk drives supported by your RSTS/E monitor.

Terminal Session

This terminal session lists the disk units configuration questions, explains them, and gives some possible responses (printed in red). After you understand the question, type the response at your console terminal. Press the ESC key to return to a previous question. However, you cannot press the ESC key to return to the terminal interface or general configuration questions.

```
RF/RS11's? *NO* (LF)
```

Explanation — The RS11 disk system consists of an RF11 controller and from one to eight RS11 fixed-head disk drives.

Response — Type Y to support these drives; type N if you do not plan to support them. In the example installation, SYSGEN.SAV indicates that there are none of these drives; thus, the response is LINE FEED.

```
RS03/RS04's? *00* (LF)
```

Explanation — The RS03/RS04 disk system consists of an RH11 or RH70 controller and from one to eight RS03 or RS04 fixed-head disk drives.

Response — Type the number (0 to 8) of RS03 or RS04 disk drives supported by your RSTS/E monitor. In the example installation, SYSGEN.SAV indicates there are none of these drives, thus the response is LINE FEED.

```
RK05's? *00* (LF)
```

Explanation — The RK05 disk system consists of an RK11 controller and from one to eight RK05 moving-head cartridge disk drives. Note that the RK05F counts as two units.

Response — Type the number (0 to 8) of RK05 disk drives supported by your RSTS/E monitor. Note that SYSGEN.SAV always prints 0 or 8 as a default. In the example installation, SYSGEN.SAV indicates that there are none of these drives, thus the response is LINE FEED. If you type 1 or 0, SYSGEN.SAV skips the next question and goes to the RL01/RL02's? question.

```
Overlapped seek?
```

Explanation — The overlapped seek driver is software that increases the efficiency of RK05 disk input/output at the expense of some memory.

Response — Type Y to use the overlapped seek driver; type N to use the nonoverlapped seek driver. DIGITAL recommends you type N to this question if you have a single RK05F disk and no RK05 disks. No overlapping can occur on the RK05F disk. Because the example installation does not have any RK05 disk drives, there is no response to this question.

```
RL01/RL02's? *04* (LF)
```

Explanation — The RL01/RL02 disk system consists of an RL11 controller and any combination of up to four RL01 and RL02 disk drives.

Response — Type the number (0 to 4) of RL01 and RL02 disk drives supported by your RSTS/E monitor. In the example installation, SYSGEN.SAV indicates that there are four of these drives, thus the response is LINE FEED. If you type 0 or 1, SYSGEN.SAV skips the next question and goes to the RK06/RK07's? question.

```
Overlapped seek? *Y* (LF)
```

Explanation — The overlapped seek driver increases the efficiency of RL01/RL02 disk input/output, at the expense of some memory.

Response — Type Y to use the overlapped seek driver; type N to use the nonoverlapped seek driver. DIGITAL recommends you choose the overlapped seek driver if you have more than one RL01/RL02 disk drive. In the example installation, the response is LINE FEED.

```
RK06/RK07's? *03* (LF)
```

Explanation — The RK06/RK07 disk system consists of an RK611 or RK711 controller and any combination of up to eight RK06 and RK07 disk drives.

Response — Type the number (0 to 8) of RK06 and RK07 disk drives supported by your RSTS/E monitor. In the example installation, SYSGEN.SAV indicates that there are three of these drives, thus the response is LINE FEED. If you type 0 or 1, SYSGEN.SAV skips the next question and goes to the RP02/RP03? question.

```
Overlapped seek? *Y* (LF)
```

Explanation — The overlapped seek driver increases the efficiency of RK06/RK07 disk input/output at the expense of some memory.

Response — Type Y to use the overlapped seek driver; type N to use the nonoverlapped seek driver. DIGITAL recommends you choose the overlapped seek driver if you have more than one drive. In the example installation, the response is LINE FEED.

```
RP02/RP03's? *00* (LF)
```

Explanation — The RP02/RP03 disk system consists of an RP11 controller and any combination of up to eight RP02 and RP03 disk drives. Note that SYSGEN.SAV always prints a default of 0 or 8.

Response — Type the number (0 to 8) of RP02 and RP03 disk drives supported by your RSTS/E monitor. In the example installation, SYSGEN.SAV indicates that there are none of these drives, thus the response is LINE FEED. If you type 0 or 1, SYSGEN.SAV skips the next question and goes to the RM02/RM03/RM05/RM80's? question.

```
Overlapped seek?
```

Explanation — The overlapped seek driver increases the efficiency of RP02/RP03 disk input/output at the expense of some memory.

Response — Type Y if you want your RSTS/E monitor to use the overlapped seek driver; type N if you want your RSTS/E monitor to use the nonoverlapped seek driver. DIGITAL recommends you choose the overlapped seek driver if you have more than one drive. Because the example installation has no RP02/RP03 disk drives, there is no response to this question.

```
RM02/RM03/RM05/RM80's? *00* (LF)
```

Explanation — The RM02/RM03/RM05/RM80 disk system consists of an RH11 or RH70 controller and any combination of up to eight RM02, RM03, RM05, or RM80 disk drives. This question asks you to type the number of these drives your RSTS/E monitor will support.

Response — Type the number (0 to 8) of RM02, RM03, RM05, and RM80 disk drives that your RSTS/E monitor will support. In the example installation, SYSGEN.SAV indicates that there are none of these drives, thus the response is LINE FEED. If you type 0 or 1, SYSGEN.SAV skips the next question and goes to the RP04/RP05/RP06's? question.

```
Overlapped seek?
```

Explanation — The overlapped seek driver increases the efficiency of RM02/RM03/RM05/RM80 disk input/output, at the expense of some memory.

Response — Type Y to use the overlapped seek driver; type N to use the nonoverlapped seek driver. DIGITAL recommends you choose the overlapped seek driver if you have more than one RM02/RM03/RM05/RM80 disk drive. In the example installation, there is no response because there are none of these drives.

```
RP04/RP05/RP06's? *00* (LF)
```

Explanation — The RP04/RP05/RP06 disk system consists of an RH11 or RH70 controller and any combination of up to eight RP04, RP05, or RP06 disk drives.

Response — Type the number (0 to 8) of RP04, RP05, and/or RP06 disk drives supported by your RSTS/E monitor. In the example installation, SYSGEN.SAV indicates there are none of these drives, thus the response is LINE FEED. If you type 0 or 1, SYSGEN.SAV skips the next question and goes to the MSCP controller? question.

```
Overlapped seek?
```

Explanation — The overlapped seek driver increases the efficiency of RP04/RP05/RP06 disk input/output at the expense of some memory.

Response — Type Y to support the overlapped seek driver; type N to support the nonoverlapped seek driver. DIGITAL recommends you choose the overlapped seek driver if you have more than one drive. Because the example installation has none of these disk drives, there is no response to this question.

```
MSCP controllers? *00* (LF)
```

Explanation — This question asks you to type the number of MSCP class controllers supported by your RSTS/E monitor. The MSCP controller is comprised of the UDA50, the RC25, and the RQDX1 controllers. The UDA50 controller can control a maximum of four RA60, RA80, and RA81 disk drives. The RC25 controller can control a maximum of two RC25 drives. The RQDX1 controller can control a maximum of one RD51 and two RX50 disk drives.

Response — Type the number (0 to 2) of MSCP controllers supported by your RSTS/E monitor. In the example installation, SYSGEN.SAV indicates there are no MSCP class controllers, thus the response is LINE FEED. (Note that if you select one or more MSCP class controllers, SYSGEN.SAV does not ask any RJ2780 related questions.)

Go to Task 7.

Task 7: Answer Peripheral Devices Configuration Questions

Your next task is to answer the *peripheral devices configuration questions*. These questions deal with the number and types of tape drives, printers, and card readers supported by your RSTS/E monitor. There are also questions related to DECnet/E, RJ2780, 3271, and 2780/3780.

Terminal Session

This terminal session lists the peripheral devices configuration questions, explains them, and gives some possible responses (printed in red). After you understand the question, type the response at your console terminal. Press the ESC key to return to a previous question. However, you cannot press the ESC key to return to the disk units, terminal interface, or general configuration questions.

```
TU16/TE16/TU45/TU77's?  #08# 1
```

Explanation — The TU16/TE16/TU45/TU77 magnetic tape system consists of an RH11 or RH70 massbus interface, a TM02 or TM03 controller, and a maximum of eight TU16, TE16, TU45, or TU77 magnetic tape drives.

Response — Type the number (0 to 8) of these tape drives supported by your RSTS/E monitor. In the example installation, the response is 1. Note that SYSGEN.SAV always prints a default of 0 or 8.

```
TU10/TE10/TS03's? #00# (LF)
```

Explanation — The TU10/TE10/TS03 magnetic tape system consists of a TM11, TMA11, or TMB11 magnetic tape controller and a maximum of eight TU10, TE10, or TS03 magnetic tape drives.

Response — Type the number (0 to 8) of these tape drives supported by your RSTS/E monitor. In the example installation, the response is LINE FEED. Note that SYSGEN.SAV always prints a default of 0 or 8.

```
TS11/TSV05/TU80's? *01* (LF)
```

Explanation — The TS11 magnetic tape system consists of a TS11 controller and one TS11, TSV05, or TU80 magnetic tape drive.

Response — Type the number (0 to 4) of TS11, TSV05, or TS80 tape drives supported by your RSTS/E monitor. In the example installation, the response is LINE FEED.

```
DECtapes?  #00# (LF)
```

Explanation — The DECtape system consists of a TC11 controller, a maximum of eight DEC single-tape drives and/or a maximum of four TU56 DEC dual-tape drives. (Note that these are dual drives; thus, if you have four TU56 units you actually have eight drives.) This question asks for the number of DECtape drives (counting each TU56 unit as two drives) your RSTS/E monitor will support.

Response — Type the number (0 to 8) of DECtape drives supported by your RSTS/E monitor. Note that SYSGEN.SAV always prints a default of 0 or 8. In the example installation, the response is LINE FEED.

```
TU58's?  #00# (LF)
```

Explanation — The TU58 DECtape–II system consists of a DL11 controller and a maximum of four TU58 DEC dual-tape drives. (Note that these are dual drives; thus, if you have four you actually have eight drives.)

Response — Type the number (0 to 8) of these drives supported by your RSTS/E monitor. Note that SYSGEN.SAV always prints a default of 0 or 8. In the example installation, the response is LINE FEED.

```
Printers?  *01* (LF)
```

Explanation — A RSTS/E monitor can support a maximum of eight LP11 or LA11 printers.

Response — Type the number of LP11 or LA11 line printers (0 to 8) supported by your RSTS/E monitor. In the example installation, the response is LINE FEED. (Note that the LP11 line printer includes the LP1125, LP1126, LP1127, and so forth.)

```
RX01/RX02's?  #08# 2
```

Explanation — The RX11 or RX211 flexible diskette system consists of a UNIBUS interface and an RX01 single density or RX02 double density flexible diskette subsystem. The RX01 and RX02 flexible diskette subsystems each consist of a disk controller and two flexible diskette drives. The RSTS/E monitor can support a maximum of four RX11 or RX211 flexible diskette systems, for a maximum of eight RX01 or RX02 flexible diskette drives.

Response — Type the number (0 to 8) of RX01 or RX02 flexible diskette drives supported by your RSTS/E monitor. Note that SYSGEN.SAV always prints a default of 0 or 8. The example installation plans to use one of these dual drives, thus the response is 2 (remember one unit consists of two drives).

```
CR11/CM11 card reader?  *NO* (LF)
```

Explanation — This question asks if your RSTS/E monitor will support the CR11 punched card reader or the CM11 marked card reader.

Response — Type Y if your RSTS/E monitor will support either of these devices; type N if it will not support either of these devices. In the example installation, the response is LINE FEED.

```
CD11 card reader?  *NO* (LF)
```

Explanation — This question asks if your RSTS/E monitor will support the CD11 high-speed punched card reader.

Response — Type Y if your RSTS/E monitor will support this device; type N if your RSTS/E monitor will not support this device. In the example installation, the response is LINE FEED.

```
Card decode?
```

Explanation — This question appears only if you answered Y to the CR11/CM11 card reader? or the CD11 card reader? questions. The RSTS/E monitor interprets cards through the use of an ANSI standard card decoder. However, it is possible that your installation uses some other card decoder. This question asks you to type the card decoder you want your RSTS/E monitor to support. See the *RSTS/E Programming Manual* for more information on the card codes.

Response — In the example installation, there is no response because N was the response to the previous card reader questions. Possible responses are: ANSI, 029 for cards punched in DEC 029, 026 for cards punched in DEC 026, or 1401 for cards punched in IBM 1401.

```
P.T. reader/punch?  *NO* (LF)
```

Explanation — This question asks if your RSTS/E monitor will support the high-speed paper tape reader and the high-speed paper tape punch.

Response — Type Y if your RSTS/E monitor will support these devices; type N if your RSTS/E monitor will not support these devices. In the example installation, the response is LINE FEED.

```
DECnet network support?  *N* (LF)
```

Explanation — DECnet/E is a DIGITAL software product that lets you communicate with two or more DIGITAL computer systems. If you want the features provided by DECnet/E, you must order the DECnet/E software kit separately from the RSTS/E distribution kit. This question asks if you want to add the code needed to support DECnet/E. The DECnet/E documentation set describes the concepts and capabilities of DECnet/E. Before you install DECnet/E, consult the *DECnet/E Network Installation Guide.*

Response — Type Y to add the code needed to support DECnet/E; type N if you plan not to use DECnet/E. If you type Y, then you will be asked to mount the tape or disk that contains the DECnet/E software in Phase 5. If you type Y, the program prints DECnet/E distribution medium? as the next configuration question; if you type N, the program prints DMC11's/DMR11's? as the next configuration question. In the example installation, the response is LINE FEED.

```
DECnet/E distribution medium?
```

Explanation — This question asks for the device designator of the tape or disk that contains the DECnet/E software kit.

Response — Type the device designator of the disk that contains the DECnet/E software kit: DK, DL, or DM.

Or, type the device designator of the tape that contains the DECnet/E software kit: MT, if you plan to mount this tape on a TU10, TE10, or TS03 tape drive; MM, if you plan to mount this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you plan to mount this tape on a TS11, TSV05, or TU80 tape drive.

The example installation plans not to use DECnet/E at this time; thus, there is no response to this question.

```
DECnet/E patching?
```

Explanation — This question asks if you want to automatically patch DECnet/E, using the ONLPAT program. The automatic patches and replacement modules are on the RSTS/E update kit.

Response — DIGITAL recommends you type Y to automatically apply any patches and replacement modules to DECnet/E; type N if you do not want to automatically apply patches and replacement modules to DECnet/E. If you type N, the program goes to the DMC11's/DMR11's? configuration question. There is no response here because the example installation plans not to use DECnet/E.

```
Patch file medium?
```

Explanation — This question asks for the device designator of the tape or disk on which you received the RSTS/E update kit, which contains the DECnet/E patches and replacement modules. If you type a disk device designator, Pack ID? is the next question.

Response — Possible disk device designators are: DK, DL, or DM.

Possible tape device designators are: MT, if you plan to mount this tape on a TU10, TE10, or TS03 tape drive; MM, if you plan to mount this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you plan to mount this tape on a TS11, TSV05, or TU80 tape drive.

```
Pack ID?
```

Explanation — This question asks for the pack ID of the disk you specified in the previous question.

Response — Check Chapter 3 of the *RSTS/E Release Notes* for the pack ID of the disk you specified in the previous question. In the example installation, there is no response because DECnet/E is not supported.

```
Patch file name?
```

Explanation — This question asks for the name of the file that contains the DECnet/E patches and replacement modules.

Response — Press LINE FEED to accept the default response of $DECNTC.CMD. In the example installation, there is no response because DECnet/E is not supported.

```
DMC11's/DMR11's?
```

Explanation — The DMC11 and DMR11 network links are synchronous communication line interfaces that implement the DDCMP line protocol in the hardware. These interfaces are used primarily with DECnet/E.

Response — Type the number (0 to 16) of DMC11 or DMR11 network links attached to your PDP–11. Because the example installation is not using DECnet/E, there is no response to this question.

```
DMV11's/DMP11's?
```

Explanation — The DMV11 and DMP11 network links are synchronous communication line interfaces that implement the DDCMP line protocol in the hardware. This question asks for the number of DMV11 or DMP11 network links attached to your PDP–11, and appears only if you typed Y to the Decnet network support? question.

Response — Type the number (0 to 16) of DMV11 or DMP11 network links attached to your PDP–11. If you type 0, the program goes to the KMC11's? configuration question. In the example installation, there is no response because DECnet/E was not chosen.

```
Controller type (DMV11/DMP11)?
```

Explanation — This question asks for the controller attached to your PDP–11. The DMV11 is for use on the PDP–11/23 PLUS Q–bus. The DMP11 is for use on the PDP–11 UNIBUS.

Response — Type either DMV11 or DMP11, depending on which one is attached to your PDP–11. In the example installation, there is no response because this installation does not use either of these line interfaces.

```
DMV11/DMP11 unit xx tributaries?
```

Explanation — This question asks for the number of tributaries you will activate at one time. SYSGEN.SAV prints this question for each DMV11/DMP11 supported by your RSTS/E monitor. For example, if you typed 5 to the DMV11/DMP11's? question, this question appears five times. (The manual shows this question only once.) The question refers to either DMV11 or DMP11, depending on how you answered the previous question. The program repeats the DMV11's/DMP11's? configuration question if you specified more than 128 tributaries. See the *DECnet/E Installation Guide* and *DECnet/E Release Notes* for information on this question.

Response — Type 1 to 12 for the DMV11, or type 1 to 32 for the DMP11. In the example installation, there is no response because this installation does not use either of these interfaces.

```
KMC11's? *00* (LF)
```

Explanation — The KMC–11 is a microprocessor that can be attached to the UNIBUS of a PDP–11. The KMC–11 runs asynchronously with the PDP–11. When loaded with the appropriate microcodes, the KMC–11 can control the 3271 or 2780/3780 IBM protocol emulators.

Response — Type the number (0 to 16) of KMC–11 microprocessors attached to your PDP–11. In the example installation, the response is LINE FEED. If you type 0, the program skips the next two questions and goes to the Extended buffering for LP? question.

```
KMC IBM protocol support?
```

Explanation — The KMC–11 microprocessor can emulate different IBM protocols. For example, the KMC–11 can handle IBM 3271 protocol emulation. This reduces PDP–11 central processor overhead because the KMC–11 eliminates almost all binary synchronous communication character interrupts and protocol processing. IBM protocol emulator products (the 3271 and high performance 2780/3780) use the extended buffer pool rather than small buffers.

Response — Type Y to add this support; type N if you do not want to add this support. If you type N, the program goes to the Extended buffering for LP? question. In the example installation, there is no response because this installation does not support KMC11s.

```
3271 or 2780/3780 simultaneous links?
```

Explanation — Each KMC–11 microprocessor can control one DUP11 synchronous line interface to the 3271 or 2780/3780 host. The 3271 is a terminal; the 2780/3780 is a remote batch job entry device. An IBM host connected to a RSTS/E computer system can communicate with these devices as though they were actually there because the RSTS/E monitor emulates them. This question asks for the number of 3271 or 2780/3780 simultaneous links you want.

Response — Type the number (0 to 16) of KMC–11/3271 or KMC–11/2780/3780 simultaneous links you want attached to your PDP–11. In the example installation, there is no response because the example installation does not support KMC–11s.

```
Extended buffering for LP? #Y# (LF)
```

Explanation — The *extended buffer pool* is (often referred to as XBUF) an area of memory reserved for data output by the printer. (It is also reserved for other kinds of data.) This question appears only if you typed 1 or more to the Printers? configuration question. It asks if you want to use the extended buffer pool instead of the small buffer pool (described in the next task) to store character output from the line printer. Each line printer driver uses a maximum of 2.5K words of the extended buffer pool while it is running. In addition, the driver is about 70 words longer if you choose this feature.

This feature improves line printer performance and reduces line printer impact on the small buffer pool; therefore, it is more useful for large systems.

Response — Type Y if you want to use the extended buffer pool to store character output from the line printer; type N if you do not want to use the extended buffer pool. In the example installation, the response is LINE FEED.

```
RJ2780 support? #NO# (LF)
```

Explanation — This question does not appear if you answered 1 or more to the MSCP controllers? question. The *RJ2780 Emulator Package* is a DIGITAL software product that emulates the IBM RJ2780 Model 1 data transmission terminal. This software lets a RSTS/E monitor communicate with any IBM computer that supports this terminal, or with another DIGITAL computer running the RJ2780 terminal emulator package. Transmission of data can originate from a card reader or disk files. Received data can be directed to a line printer or disk files. All data is transmitted in EBCDIC or binary code, and communication is supported over synchronous, point-to-point contention mode only, at up to 4800 baud. This package also supports a spooling operation that allows RSTS/E users to queue files for transmission.

If you want to support this package, you must order the RJ2780 software kit separately from the RSTS/E distribution kit. For more information on this software package, see the *RSTS/2780 User's Guide*. Messages printed by the SYSBAT.SAV program in Phase 5 will tell you when to mount the tape or disk that contains the RJ2780 software.

Response — Type Y to add the code needed by the RSTS/E monitor to support this optional software; type N if you do not want to add this optional software. If you type N, Maximum jobs? is the next question. In the example installation, the response is LINE FEED, which accepts the default response of N.

```
RJ2780 interface?
```

Explanation — The RJ2780 Emulator Package requires a DP11, DU11, or DUP11 synchronous line interface and the KG11–A communications arithmetic unit. This question asks you to specify the synchronous line interface you want to use with the RJ2780 Emulator Package.

Response — Type DP11, DU11, or DUP11. Because the example installation plans not to use the RJ2780 package, there is no response.

```
RJ2780 distribution medium?
```

Explanation — This question asks for the device designator of the tape or disk that contains the RJ2780 Emulator Package software kit.

Response — Type the device designator of the disk that contains the RJ2780 Emulator Package software kit: DK, DL, or DM.

Or, type the device designator of the tape that contains the RJ2780 Emulator Package software kit: MT, if you plan to mount this tape on a TU10, TE10, or TS03 tape drive; MM, if you plan to mount this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you plan to mount this tape on a TS11, TSV05, or TU80 tape drive. Because the example installation plans not to use this software, there is no response.

```
RJ2780 patching?
```

Explanation — This question asks if you want to automatically patch the RJ2780 Emulator Package, using the ONLPAT program. The automatic patches and replacement modules are on the RSTS/E update kit.

Response — DIGITAL recommends you type Y to automatically apply any patches and replacement modules to the RJ2780 Emulator Package; type N if you do not want to automatically apply patches and replacement modules to the RJ2780 Emulator Package. If you type N, the program goes to the Maximum jobs? question. Because the example installation does not use RJ2780, there is no response.

```
Patch file medium?
```

Explanation — This question asks for the device designator of the tape or disk on which you received the RSTS/E update kit, which contains the RJ2780 patches and replacement modules.

Response — Type the device designator of the disk: DK, DL, or DM. If you type a disk device designator, Pack ID? is the next question.

Type the device designator of the tape: MT, if you plan to mount this tape on a TU10, TE10, or TS03 tape drive; MM, if you plan to mount this tape on a TU16, TE16, TU45, or TU77 tape drive; MS, if you plan to mount this tape on a TS11, TSV05, or TU80 tape drive.

Because the example installation does not use RJ2780, there is no response here.

```
Pack ID?
```

Explanation — This question asks for the pack ID of the disk that contains the RJ2780 patches and replacement modules.

Response — Check Chapter 3 of the *RSTS/E Release Notes* for the pack ID of the RSTS/E update disk. Because the example installation does not use RJ2780, there is no response here.

```
Patch file name?
```

Explanation — This question asks for the name of the file that contains the RJ2780 patches and replacement modules.

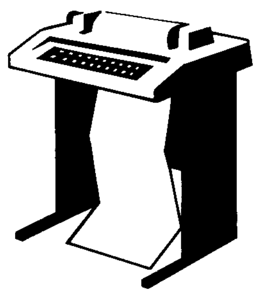
Response — Press LINE FEED to accept the default of $RJ2780.CMD. Because the example installation does not use RJ2780, there is no response here.

Go to Task 8.

Task 8: Answer Software Tuning and Features Configuration Questions

Your next task is to answer the *software tuning and features configuration questions.* These questions relate to RSTS/E monitor software features, such as maximum number of jobs, small buffers, system-wide logicals, and so forth.

Terminal Session



This terminal session lists the software tuning and features configuration questions, explains them, and gives you some possible responses (printed in red). After you understand the question, type the response at your console terminal. Press the ESC key to return to a previous question. However, you cannot press the ESC key to return to the peripheral devices, disk units, terminal interface, or general configuration questions.

```
Maximum jobs? #10# 27
```

Explanation — In Phase 2 you were asked to calculate the number of jobs your RSTS/E monitor would support by using the Job Calculation Worksheet. (See Task 6 in Phase 2 for more information on jobs.) You will be able to decrease the maximum job number in Phase 7, when you set RSTS/E monitor defaults. However, you cannot increase the number you enter here unless you perform another system generation.

Response — Refer to the Job Calculation Worksheet now (Phase 2, Figure 4) and enter the maximum number of jobs (2 to 63) your RSTS/E monitor will support.

```
Small buffers? #323# (LF)
```

Explanation — A *small buffer* is a 16–word storage area located in the monitor area of memory. There are two types of small buffers: *general small buffers* and *FIP small buffers.* You allocate general small buffers now by answering this question. Note that SYSGEN.SAV automatically calculates the number of general small buffers you need for your installation. In the example installation, for instance, the program calculates a total of 323 general small buffers. Your default may differ from the default in the example installation. Your installation may also need more than the number printed in the default. A more detailed explanation of how to add general and FIP small buffers is provided in the Allocate Memory to the Small Buffer Pools Task, located in the memory allocation-related tasks section of this manual.

Response — Because you will have the opportunity to add more small buffers in a later task, press LINE FEED to accept the default. Or type in the number of small buffers you want. In the example installation, the response is LINE FEED.

```
System wide logicals? #25# (LF)
```

Explanation — A *logical name* consists of one- to six-alphanumeric characters followed by a colon that you can assign to any RSTS/E device. A *system-wide logical name* is a logical name assigned by a system manager; any user can then type this system-wide logical name to access the device and account it represents.

Each system-wide logical name requires five words of monitor memory. See the *RSTS/E Programming Manual*, the *RSTS/E System Manager's Guide*, and the *RSTS/E System User's Guide* for more information.

Response — Type the number (5 to 999) of system-wide logical names you plan to use now and in the future. In the example installation, the response is LINE FEED.

```
Monitor statistics? #NO# (LF)
```

Explanation — *Monitor statistics* is a software feature that provides tables that record job, disk, and directory cache statistics. This feature is not supported by DIGITAL unless you provide for such support in a DIGITAL Software Services Consultation Contract. This feature may change in future releases with respect to what data is accumulated and how the data is accessed.

Response — Type Y if you want this feature; type N if you do not want this feature. In the example installation, the response is LINE FEED.

```
EMT logging? #NO# (LF)
```

Explanation — *EMT logging* is a feature that allows you to pass information on selected monitor directives by means of send/receive to a program that you write after you build your monitor. Your program can then make use of these monitor directives to log selected kinds of system activity. See the *RSTS/E System Manager's Guide* for more information on EMT logging.

Response — Type Y if you want your monitor to support EMT logging (in which case you will have to write a program); type N if you do not want this support. If you type Y to this question, SYSGEN.SAV does not ask the Resident send/receive? question because it automatically becomes resident. In the example installation, the response is LINE FEED, which accepts the default of NO.

```
Directory caching? #Y# (LF)
```

Explanation — *File processor buffering (FIP)* — more frequently called *directory caching* — is a software feature that accelerates file processing. Because it can use small buffers or extended buffers to store directory information, directory caching improves the performance of operations that involve the access of disk directories. Examples of operations that involve the access of disk directories are file open and close operations, directory listing operations, and wildcard file operations. (You can turn directory caching on or off during timesharing with the ENABLE and DISABLE commands of the UTILTY program. See the *RSTS/E System Manager's Guide.*)

Response — Type Y if you want the directory caching feature; type N if you do not want this feature. DIGITAL strongly recommends you type Y to this question because of the speed gained for file processing. If you choose directory caching, you should allocate a minimum of 2K words to the extended buffer pool in Phase 7. In the example installation, the response is LINE FEED.

```
Data caching? #NO# (LF)
```

Explanation — *Extended data buffering* (more frequently called *data caching*) is a software feature that reduces the number of data transfers from disk to memory, thereby increasing response time. Because it reduces the number of data transfers between disk and memory, extended data buffering is most useful for speeding up read operations.

Data caching uses only extended buffers, unlike directory caching, which uses both extended buffers and small buffers. (See the *RSTS/E System Manager's Guide* for more information on data caching.)

Response — DIGITAL recommends you type N if your PDP–11 has 128K words of memory or less, because you cannot afford to allocate enough memory to the extended buffer pool to make data caching effective. (These PDP–11s should use directory caching.) If you have enough memory, type Y. To select data caching, however, you must also have selected directory caching. In Phase 7, you will need to allocate a minimum of 2K words to the extended buffer pool. In the example installation, the PDP–11/34 has less than 128K of memory; thus, LINE FEED is the response.

```
Resident libraries? #Y# (LF)
```

Explanation — A *resident library* is a collection of shareable code and/or data that saves disk access time and lessens the load on disk input/output drivers. The resident library stores the code or data in memory and allows more than one program to share the code or data.

You must include the resident library feature if:

- You plan to use RMS–11 (which you can build in Phase 8), in which case you will be able to use the RMS–11 resident library.
- You plan to use the shared version of EDT (which you can build in Phase 8).
- You plan to use any optional software that requires this feature. See the appropriate installation guide for any optional software you plan to build. It may tell you to answer Y to this question.

To learn how to create your own resident libraries, see the *RSTS/E Task Builder Reference Manual*; see the *RSTS/E System Manager's Guide* or the *RSTS/E Programming Manual* for information on how to load a resident library.

If you choose resident libraries, the size of your monitor increases by approximately .5K words. In addition, each job that accesses a resident library uses an additional one to three small buffers.

Response — Type Y if you have at least 124K words of memory and you plan to use resident libraries; otherwise, type N. In the example installation, the response is LINE FEED.

```
RSX directives? #Y# (LF)
```

Explanation — *RSX directives* is a software feature that allows the RSTS/E monitor to perform the functions (except the load operation and keyboard monitor) of the RSX run-time system. When you choose this feature, *RSX emulator code* (code that imitates the RSX run-time system) becomes part of the RSTS/E monitor. After the RSX run-time system loads a program into memory, it passes control to the RSX emulator code. Therefore, the RSX run-time system is no longer needed, and the RSTS/E monitor removes it from the user address space. (This is why the RSX run-time system is often called the *disappearing RSX run-time system.*)

When you select this feature, programs that run under the RSX run-time system do not require a run-time system; therefore, they can be 32K (instead of 28K with the BASIC–PLUS run-time system).

You must answer Y to this question if:

- You plan to use the RMS–11 resident library.
- You plan to use the shared version of EDT.
- You plan to use BASIC–PLUS 2 V2.0
- You plan to use optional software that requires RSX directives. See the appropriate installation guides.
- You plan to develop programs using TKB.

Although this feature adds 1K word to the size of your monitor, it is worth it because you gain 4K words of memory.

Note

If you choose this feature, programs on your system will not be able to read data from the RSX run-time system (that is, from the pseudo-vector region as described in the *RSTS/E System Directives Manual*). The error message indicating this failure is: Memory Management Violation.

Response — Type Y to include RSX directives; type N if you do not want to include RSX directives. In the example installation, the response is LINE FEED.

```
Resident file OPEN/CLOSE? #Y# (LF)
```

Explanation — The *overlay code* is that part of the RSTS/E monitor code that resides on disk, not in memory. The overlay code is loaded into memory when needed, and "overlays" part of the RSTS/E monitor that is resident in memory. The monitor save image library (SIL) stores the overlay code on the disk. (You may have created the OVR.SYS file in Phase 2. OVR.SYS stores a copy of the overlay code.)

This question–and the five subsequent ones–ask if you want portions of the overlay code to be resident in memory rather than on disk during timesharing. System performance improves if you make frequently used code memory resident. DIGITAL recommends you press LINE FEED to accept the default response of Y to this and the following five questions, unless you have severe memory constraints.

The following functions are made memory resident by answering Y to this question:

- System routines for disk file creation
- Open and close routines
- Routines for processing the RUN command
- General routines for opening other devices, and for retrieving error messages.

Response — Because open/close code is so frequently used, DIGITAL recommends you accept the default by pressing LINE FEED. If memory space is critical, type N. In the example installation, the response is LINE FEED.

```
Resident send/receive? #Y# (LF)
```

Explanation — The *send/receive overlay code* provides interjob communications for such programs as OPSER, QUEMAN, and BATCH. If your applications require frequent interjob communications, then choosing to make this code memory resident improves system performance. If you answered Y to the DECnet network? or EMT logging? questions, this code is automatically made memory resident; thus, the question does not appear.

Response — Type Y or press LINE FEED to make this code memory resident; type N if you do not want to make this code memory resident. In the example installation, the response is LINE FEED.

```
Resident simple SYS calls? #Y# (LF)
```

Explanation — This question determines whether certain common SYS() function routines are made memory resident. All these routines are subfunctions of the FIP SYS() call (function code 6). The following functions are made memory resident by answering Y to this question:

- Monitor tables part 1, 2, and 3 (function codes –3, –12, and –20)
- Open files information (function –8)
- Date and time conversions (function +20) and the BASIC–PLUS Date$() and Time$() functions.
- Return job status (function +26)

The *RSTS/E Programming Manual* describes the SYS calls.

Response — DIGITAL recommends that you make this code memory resident by pressing LINE FEED, as in the example installation. (Note that if you press ESC to this question, SYSGEN.SAV will not return to any previous questions.) Or, type NO to make this code nonmemory resident.

```
Resident file DELETE/RENAME? #Y# (LF)
```

Explanation — The *file DELETE/RENAME code* is used whenever you delete and rename files.

Response — DIGITAL recommends you accept the default by pressing LINE FEED if your system is large or if your applications require a large number of file delete and rename operations. The code then becomes memory resident, thereby improving performance. Type N to make this code nonmemory resident.

```
Resident attribute? #Y# (LF)
```

Explanation — The *attribute code* performs file attribute read/write operations.

Response — DIGITAL recommends you accept the default of Y by pressing LINE FEED if:

- You plan to use languages such as COBOL–81, BASIC–PLUS–2, and FORTRAN 77.
- You plan to use the task builder for or during program developement.
- You plan to use RMS–11.

Type N to make this code nonmemory resident.

```
Resident directory lookup? #Y# (LF)
```

Explanation — The *directory lookup code* gathers information about disk directories, performs wildcard disk file lookups, and manipulates file identification blocks for certain files. This code is used by the CATALOG command in BASIC–PLUS and by PIP.SAV for obtaining directory information. DCL, DIR, and COPY also use this code.

Response — DIGITAL recommends that you accept the default of Y by pressing LINE FEED to make this code memory resident, if you use any of the programs or commands listed in the explanation. In the example installation, the response is LINE FEED. Type N to make this code nonmemory resident.

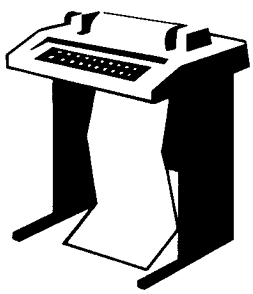
If you answered Y to the Generate BASIC–PLUS? configuration question, go to Task 9.

If you answered N to that question, go to Phase 5.

Task 9: Answer BASIC–PLUS Configuration Questions

Your next task is to answer the *BASIC–PLUS Configuration Questions*. These questions relate to optional features of the BASIC–PLUS run-time system such as math precision, logarithmic functions, and trigonometric functions. Note that you cannot answer Y to all of these questions because your BASIC–PLUS run-time system would exceed 16K words (which limits programs running under BASIC–PLUS to a maximum size of 12K words).

Terminal Session



This terminal session lists the BASIC–PLUS configuration questions, explains them, and gives some possible responses (printed in red). After you understand the question, type the response at your console terminal. Press the ESC key to return to an earlier BASIC–PLUS question. However, you cannot use the ESC key to return to the software tuning, peripheral devices, disk units, terminal interface, or general configuration questions.

Your answers to the FPP?, FIS?, Math precision?, Log functions?, and Trig functions? questions determine which mathematical software package the BASIC–PLUS run-time system will use. Before you answer these questions, you may want to study Table 12, which lists the 15 math packages on the RSTS/E distribution kit.

Table 12: Math Packages Available with BASIC–PLUS

Math Package	Description
MA2	2–word without FIS or FPP
MA2I	2–word with FIS
MA2F	2–word with FPP
MA4	4–word without FIS or FPP
MA4F	4–word with FPP
XL2	2–word log function without FIS or FPP
XL2I	2–word log function with FIS
XL2F	2–word log function with FPP
XL4	4–word log function without FIS or FPP
XL4F	4–word log function with FPP
XT2	2–word trig function without FIS or FPP
XT2I	2–word trig function with FIS
XT2F	2–word trig function with FPP
XT4	4–word trig function without FIS or FPP
XT4F	4–word trig function with FPP

```
FPP? *NO* (LF)
```

Explanation — The *floating point processor (FPP)* is hardware that supports both single-precision (2–word) or double-precision (4–word) floating point instructions. For a description of these floating point instructions, see the *BASIC–PLUS Language Manual.* FPP is available for the PDP–11/23 PLUS, 11/24, 11/34, 11/45, 11/50, 11/55, and 11/70. It is standard hardware on the 11/60.

Response — SYSGEN.SAV prints a Y default if your PDP–11 has FPP; it prints a N default if your PDP–11 does not have FPP. Type Y or press LINE FEED if your PDP–11 has FPP; type N or press LINE FEED if it does not. If you type Y, the program goes to the Math precision? question. In the example installation, SYSGEN.SAV indicates there is no FPP on the PDP–11/34; thus, the response is LINE FEED.

```
FIS? *NO* (LF)
```

Explanation — The *floating instruction set (FIS)* is hardware that provides single-precision floating point instructions. The FIS is available only on the PDP–11/40 and 11/35. For these processors, the BASIC–PLUS run-time system uses the slower software math packages to perform double-precision floating point operations.

Response — SYSGEN.SAV prints a Y default if your PDP–11 has FIS; it prints a N default if it does not. Type Y or press LINE FEED if your PDP–11 has FIS; type N or press LINE FEED if it does not. In the example installation, SYSGEN.SAV indicates there is no FIS; thus, the response is LINE FEED.

```
Math precision? #02# (LF)
```

Explanation — This question asks if you want your math package to support single-precision or double-precision floating point instructions. The single-precision floating point instructions provide floating-point numbers that are precise to six significant digits; the double-precision floating point instructions provide floating point numbers that are precise to 15 significant digits. In addition, the double-precision floating-point instructions provide a *scaled arithmetic* feature. The *BASIC–PLUS Language Manual* describes this feature, along with its associated SCALE command. Scaled arithmetic is useful for calculating sums that cannot be easily expressed as integer quantities, such as dollars and cents.

Response — Type 2 if you want the single-precision floating point instruction; type 4 if you want the double-precision floating point instruction. In the example installation, LINE FEED is the response.

```
Log functions? #Y# (LF)
```

Explanation — This question asks if you want the BASIC–PLUS run-time system to use the logarithmic functions SQR, EXP, LOG, and LOG10. The *BASIC–PLUS Language Manual* describes these log functions. Some installations may not need this feature, in which case you can reduce the size of the BASIC–PLUS run-time system by answering N to this question. (The polynomial calculation portion of the math functions is present if either this or the trigonometric feature are included.) Operations such as X^Y require the log functions if Y is not an integer.

Response — Type Y to add the logarithmic functions; type N if you do not want to add the logarithmic functions. In the example installation, the response is LINE FEED.

```
Trig functions? #Y# (LF)
```

Explanation — This question asks if you want the BASIC–PLUS run-time system to use the trigonometric functions SIN, COS, TAN, and ATN. The *BASIC–PLUS Language Manual* describes these functions. Some installations may not need this feature, in which case you can reduce the size of the BASIC–PLUS run-time system by answering N to this question. (The polynomial calculation portion of the math functions is present if either this or the logarithmic feature are included.)

Response — Type Y if you need to add these functions; type N if you do not need to add these functions. In the example installation, the response is LINE FEED.

```
Print using? #Y# (LF)
```

Explanation — This question asks if you want special output formatting with the PRINT–USING statement of BASIC–PLUS, as described in the *BASIC–PLUS Language Manual.* You can reduce the size of the BASIC–PLUS run-time system by answering N to this question.

Response — Type Y if you need this feature; type N if you do not need this feature. In the example installation, the response is LINE FEED.

```
Matrices? #NO# (LF)
```

Explanation — This question asks if you want BASIC–PLUS to operate on an entire matrix using single MAT statements, as described in the *BASIC–PLUS Language Manual.*

Response — Type Y if you need this feature; type N if you do not need this feature. In the example installation, the response is LINE FEED.

```
String arithmetic? #NO# (LF)
```

Explanation — The BASIC–PLUS run-time system can use special string arithmetic functions like SUM$, DIF$, PROD$, QUO$, PLACE$, and COMP%. These functions perform arithmetic functions on strings of numeric characters, minus signs, and decimal points with an accuracy of up to 56 significant digits. The string arithmetic functions, although slow to execute, are useful for applications that involve large numbers, such as monetary conversions. See the *BASIC–PLUS Language Manual* for detailed information on string arithmetic functions.

Response — Type Y if you need this feature; type N if you do not need this feature. In the example installation, the response is LINE FEED.

```
The system generation dialog is finish-
ed. If you have any special requirements
which require editing the generated file
CONFIG.MAC (system configuration file) or
SYSGEN.CTL (batch control file) you may
do it now. When ready type "RUN $SYSBAT".
```

Explanation — SYSGEN.SAV prints the above information when you answer the final question.

Go to Phase 5.

Phase 5
Configure RSTS/E Monitor, Part II

Now that you have finished answering the configuration questions, you are ready to perform the second part of configuring your RSTS/E monitor. This involves running the SYSBAT.SAV program.

Task 1: Run SYSBAT.SAV Program

Remember that in Task 3 of the previous phase you copied SYSBAT to your system disk. The *SYSBAT program* completes the building of the configuration file (CONFIG.MAC) and the batch control file (SYSGEN.CTL); that is, it builds your RSTS/E monitor and the BASIC–PLUS run-time system (if you answered Y to the Generate BASIC–PLUS? question).

The *CONFIG.MAC file* contains most of the options you selected when you answered the configuration questions in the previous phase. The *SYSGEN.CTL file* contains the commands that assemble terminal service, device drivers, system tables, and some of the options you selected in the previous phase. This file also contains commands that link your RSTS/E monitor to the BASIC–PLUS run-time system.

Terminal Session

This terminal session explains how to run SYSBAT.

```
The system generation dialog is finish-
ed. If you have any special requirements
which require editing the generated file
CONFIG.MAC (system configuration file) or
SYSGEN.CTL (batch control file) you may
do it now. When ready type "RUN $SYSBAT".
```

Explanation — You stopped here in the last task of the previous phase. Although the message tells you that you can edit these files, DIGITAL does not support this activity.

Response — To run SYSBAT.SAV, type:

```
.RUN $SYSBAT

^C
HELLO 1/2
Password:
1 other user is logged in under this account
.
.SIZE 20
MOUNT AP-2773K-BC OR BB-H751K-BC ON A MAGTAPE DRIVE
WITH NO "WRITE RING" AND SET TO "ON LINE"
Mount MM:"SYSGNK"-write locked
Unit? 0
```

Explanation — SYSBAT prints output on your console terminal while it executes commands in the SYSGEN.CTL file. (The output is not shown here.) These commands generate the RSTS/E monitor save image library (SIL) and the BASIC–PLUS run-time system, if you chose it. Additionally, SYSBAT may ask you to load a particular tape or disk, depending on how you answered certain configuration questions. In the example installation, SYSBAT asks for the RSTS/E distribution tape that contains the system generation programs and files. Note that SYSBAT prints the order numbers of the 800 and 1600 bpi tape. (It will print the order numbers of the disks if your RSTS/E distribution kit was on disk.) In the example installation, the appropriate tape is loaded (if it was not already loaded) and the answer to the Unit? question is 0.

Note

See the *RSTS/E Release Notes*, Chapter 3, for a list of order numbers and contents of the different RSTS/E distribution kits.

SYSBAT may ask you to mount other disks and tapes, depending on how you answered the configuration questions. The order may differ depending on how you answered the questions:

- SYSBAT.SAV asks you to load the distribution tape or disk that contains the system generation programs and files. (It may ask you to load this tape or disk more than once.)
- DECnet network support? – If you answered Y to this question, SYSBAT.SAV asks you to load the DECnet/E Software Kit.
- RJ2780 support? – If you answered Y to this question, SYSBAT.SAV asks you to load the RJ2780 Software Kit.
- Monitor patching? – If you answered Y to this question, SYSBAT.SAV asks you to load the RSTS/E update kit.

- BASIC–PLUS patching? – If you answered Y to this question, SYSBAT.SAV asks you to load the RSTS/E update kit.
- RSX patching? – If you answered Y to this question, SYSBAT.SAV asks you to load the RSTS/E update kit.
- Output medium? – If you answered anything other than SY to this question, SYSBAT asks you to load the tape or disk you designated as your system disk.

In addition to these questions, SYSBAT also prints a table that tells you how many small buffers you can add. This table will be shown and discussed in the Allocate Memory to the Small Buffer Pools Task, located in the Conditional Tasks section of this manual.

After SYSBAT executes the files, it prints information similar to:

```
.R LOGOUT
Confirm:Y
Saved all disk files; 6152 blocks in use
Job 2 User 1,2 logged off KB1 at 15-Dec-82 6:58 AM
1 other user still logged in under this account
System RSTS V8.0-06 RSTS/E SYSGEN
Run time was 11 minutes, 28.1 seconds
Elapsed time was 39 minutes
Good morning
Batch job completed.
.
```

You are finished with Phase 5. If any error messages appear in the printout, see Appendix A.

Go to Phase 6.

Phase 6
Shut Down SYSGEN Monitor

Now that you have built your RSTS/E monitor, you no longer need the SYSGEN monitor. In this phase, you will run the UTILTY.SAV program to shut down the SYSGEN monitor.

Task 1: Run UTILTY Program

```
 .R LOGOUT
Confirm: Y
Saved all disk files; 6152 blocks in use
Job 2 User 1,2 logged off KB1 at 15-Dec-82 6:58 AM
1 other user still logged in under this account
System RSTS V8.0-06 RSTS/E SYSGEN
Run time was 11 minutes, 28.1 seconds
Elapsed time was 39 minutes
Good morning
Batch job completed.
 .
```

Explanation — After SYSBAT.SAV finishes building your monitor, it prints the above information. The dates and times are installation dependent. SYSBAT finishes by telling you the batch job is completed. You can now shut down the SYSGEN monitor.

Response — To shut down the SYSGEN monitor type:

```
 .R UTILTY
*NO LOGINS
*SHUTUP

RSTS V8.0-06 RSTS/E SYSGEN (DM0) INIT V8.0-06

Option:
```

Explanation — After you shut down the SYSGEN monitor, INIT.SYS prints the current version number of RSTS, the installation name (which you specified in Phase 3), and the device designator and unit number of the drive your system disk is mounted on. You are back under control of INIT.SYS. (You see the installation name you specified for the SYSGEN monitor because you have not yet installed your RSTS/E monitor. You will do this in Phase 7.)

Note

After you shut down the SYSGEN monitor, you may want to correct errors that occurred during the running of the SYSBAT program. To return to the configuration questions:

1. Specify the START option of INIT.SYS. START prints the list of disabled devices and the message: ?Can't find file or account. It then prints the period prompt that means you are running under the control of the SYSGEN monitor.

2. Run the UTILTY program by typing at the period prompt:

```
.R UTILTY
*LOGINS
*CTRL/C
```

3. INIT.SYS returns to the period prompt. Type RUN $SYSGEN to return to the first configuration question.

Go to Phase 7.

Phase 7 Tailor RSTS/E Monitor

This phase describes the tasks you must perform to tailor your RSTS/E monitor. To tailor your RSTS/E monitor means to:

- Establish RSTS/E monitor defaults
- Make adjustments to the memory allocation table

This phase differs from Phase 3 (where you tailored your SYSGEN monitor), in that you must make more decisions about how you answer certain questions. Another difference is that you can adjust the memory allocation table: for example, you can allocate more memory to the small buffer and extended buffer pools.

The tasks are:

- Task 1: Install RSTS/E Monitor (INSTALL)
- Task 2: Establish RSTS/E Monitor Defaults (DEFAULT)
- Task 3: List File Status Table (REFRESH LIST)
- Task 4: Start RSTS/E Monitor (START)

Task 1: Install RSTS/E Monitor (INSTALL)

To install your RSTS/E monitor, use the INSTALL option of INIT.SYS. You used this option to install the SYSGEN monitor in Phase 3.

Terminal Session

This terminal session lists the INSTALL question, explains it, and gives you some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response printed in red in the example installation.

If you want an online explanation, press RETURN after the question. Type CTRL/C to any question to return to the Option: prompt.

The common INSTALL dialogue error messages appear in Table 13. If your error messages do not appear there, see Appendix A.

```
RSTS V8.0-06 RSTS/E SYSGEN (DMO) INIT V8.0-06

Option: INSTALL
```

Explanation — In Phase 6 you ran the UTILTY program to shut down the SYSGEN monitor. Now you need to use the INSTALL option of INIT.SYS to install your RSTS/E monitor.

Response — Type INSTALL or IN.

```
Sil <SYSGEN>? RET
```

Explanation — This question asks for the name of your RSTS/E monitor. Note that the name of the monitor you installed in Phase 3 (SYSGEN) appears in brackets. Although you shut down the SYSGEN monitor in Phase 6, it remains the installed monitor until you install your RSTS/E monitor.

Response — Before you respond with a name, check the monitors you currently have in account [0,1]. To do this, press RETURN after the Sil? question.

```
Directory of all .SIL files in [0,1]:

SYSGEN.SIL
RSTS80.SIL

Sil <SYSGEN>? RSTS80

Option:
```

Explanation — After you press RETURN, INSTALL prints a directory of all monitor SILs in account [0,1]. In phase 3, there was only one monitor SIL in this account—the SYSGEN monitor. Now your RSTS/E monitor is also in this account. Note that the monitor name, RSTS80, is the name typed by the example installation in response to the Monitor name? configuration question. (Your response to that question may have been different.) As you can see, it is possible to have more than one monitor in account [0,1]. However, it is not possible to have more than one monitor installed at the same time.

Response — Type the name of your RSTS/E monitor, the one you designated in response to the Monitor name? configuration question. In the example installation, the response is RSTS80.

INSTALL makes sure that the monitor you want to install contains all the necessary modules. If a module is missing or is in an incorrect format, INSTALL prints an error message and returns to the Option: prompt. If this happens, report your problems to a DIGITAL software support specialist, or write an SPR. If you get the message: Monitor too big, you need to make the RSTS/E monitor smaller by answering the configuration questions again and specifying less devices, small buffers, and so forth. After INSTALL successfully installs your RSTS/E monitor, it returns to the Option: prompt without printing an error message.

Note that this is different from what occurred in Phase 3, where you installed the SYSGEN monitor. In Phase 3, INSTALL rebooted your system disk before returning to the Option: prompt. INSTALL does not reboot your system disk now because INIT.SYS has already completely scanned the hardware configuration. It takes 30–40 seconds to install your RSTS/E monitor.

You may need to perform some device-related tasks now. These tasks are associated with the SET option of INIT.SYS. You might find it helpful to perform List Status of Devices (SET LIST), Enable Modem Control for Keyboards (SET MODEM), and Establish Line Printer Characteristics (SET LP) tasks now. Go to the device-related tasks located in the Conditional Tasks section of this manual.

You might also have to enter some manual patches to your installed monitor and run-time system. A manual patch is a correction to code. You would have to do this only if the correction is not on the update kit. You will be notified either in the *RSTS/E Release Notes* or by a software support specialist should this ever occur. You will also be provided with instructions for entering this manual patch.

> If your installation does not require you to perform any of these tasks, then continue with this phase and go to Task 2.

Table 13: INSTALL Error Messages

Message and Meaning
`FILE NOT FOUND` The installation code did not find the SIL file that you specified on the system disk in account [0,1].
`ILLEGAL FILE NAME` The file name you typed is not one- to six-alphanumeric characters.
`INVALID SIL FORMAT` The file you specified does not have a valid SIL index block. Call your DIGITAL software support specialist or write an SPR.

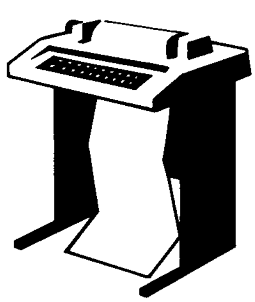
Task 2: Establish RSTS/E Monitor Defaults (DEFAULT)

Your next task is to use the DEFAULT option of INIT.SYS to establish RSTS/E monitor defaults. This task is similar to the one you performed in Phase 3 for the SYSGEN monitor. Here, however, you make more decisions before answering the questions. In addition, you may have to allocate more memory to the small buffer and extended buffer pools.

You need to set the following defaults for your RSTS/E monitor:

- Maximum number of jobs the monitor allows during timesharing
- The maximum storage space a job can occupy in memory and in the swap files
- Primary run-time system
- Error message file
- Installation name, used in the LOGIN program's identifying message
- Memory for the extended buffer pool (XBUF suboption)
- Memory for the small buffer pool (BUFFERS suboption)
- Data caching parameters
- Crash dump
- Magnetic tape labeling
- System clock
- Date and time formats
- Power fail delay

Terminal Session



To establish defaults for your RSTS/E monitor, you must answer some questions asked by DEFAULT. This terminal session lists the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response printed in red in the example installation.

If you want an online explanation, press RETURN after the question. Press CTRL/C to any question to return to the Option: prompt.

The common DEFAULT error messages and the common memory allocation table error messages appear in Table 14. If your error messages do not appear there, see Appendix A.

```
Option: DEFAULT
```

Explanation — You stopped here in the last task of the previous phase.

Response — Type DEFAULT or DE.

```
No defaults are currently set in RSTS80.SIL.

You currently have: JOB MAX = 27, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? YES
```

Explanation — DEFAULT tells you that no defaults are currently set for your RSTS/E monitor. After this message, DEFAULT prints your current JOB and SWAP MAX. The *JOB MAX* is the largest number of jobs you can run during timesharing. DEFAULT prints the number you specified in response to the Maximum jobs? configuration question. In the example installation, 27 is the JOB MAX. (You calculated the number of jobs in Phase 2.) The JOB MAX for your installation may be different.

The SWAP MAX is the largest amount of storage space that a job can occupy in memory and in the swap files. In the example installation, DEFAULT shows a SWAP MAX of 32K words. (You calculated the SWAP MAX in Phase 2.) The SWAP MAX for your installation may be different.

Response — Type YES if you want to change the JOB or SWAP MAX. Type NO or press LINE FEED if you are satisfied with these values. In the example installation, the response is YES.

```
New JOB MAX? (LF)
```

Explanation — DEFAULT prints the question again. It asks if you want to specify another default JOB MAX.

Response — Type a number from 1 to the number DEFAULT printed in its opening message. In the example installation, the default JOB MAX can range from 1 to 27. That is, for this installation any number greater than 27 could not be specified as the default job maximum. If you want to retain the value printed by DEFAULT, type NO, OLD, or press LINE FEED. In the example installation, the response is LINE FEED.

```
New SWAP MAX? (LF)
```

Explanation — DEFAULT now asks you to specify the default SWAP MAX.

Response — Type a number from 8K to 32K. See the SWAP MAX worksheet (Figure 5, Phase 2); you should have already decided on the SWAP MAX for your installation. To retain the value printed by DEFAULT, type NO, OLD, or press LINE FEED. In the example installation, the response is LINE FEED. If you did not calculate the SWAP MAX correctly, DEFAULT prints:

```
Warning - this SWAP MAX requires that SWAP.SYS be at least n blocks.
SWAP.SYS is currently m blocks.

You must reduce SWAP MAX now or at START time, or use REFRESH before
starting to enlarge SWAP.SYS.
```

In the message, n indicates the minimum size for SWAP.SYS and m indicates the current size. You must use the CHANGE suboption of REFRESH to allocate the minimum number of blocks. (If you followed the instructions in Phase 2, you will probably not see this message.)

```
JOB or SWAP MAX changes? NO
```

Explanation — After you specify the default JOB and SWAP MAX, DEFAULT again asks the question. This gives you another opportunity to change the defaults.

Response — Type YES if you want to make any changes; type NO if you are satisfied with the default values. In the example installation, the response is NO.

```
Run Time System? (RET)
```

Explanation — This question asks for the name of the primary run-time system associated with your installed RSTS/E monitor. At this point in system generation, all run-time systems are stored as files in account [0,1] with the file type .RTS.

Response — Before typing a response, press RETURN to check the run-time systems currently stored in account [0,1]. To do this, press RETURN.

```
Specify the name of the Run Time System to be used as the system de-
fault. The named Run Time System must exist on the system disk in ac-
count [0,1] with the extension 'RTS'.

Directory of all valid run time systems:

RT11.RTS
BASIC.RTS
RSX.RTS

Name of default Run Time System? RSX
```

Explanation — After you press RETURN, DEFAULT prints the online instruction and the directory of all run-time systems currently in account [0,1]. Note that in the example installation there are now three run-time systems: RSX, BASIC, and RT11.

Response — Type the name of your primary run-time system (RSX or BASIC). In the example installation, RSX is the primary run-time system.

```
Error message file? ERR
```

Explanation — This question asks for the name of the error message file in account [0,1].

Response — Type ERR as the error message file for your RSTS/E monitor.

```
Installation name? My System
```

Explanation — This question asks for the name of your installation. You see this name each time you log in or out. It is also the name associated with system error message 0.

Response — Type an installation name, using from 1 to 15 alphanumeric characters, including spaces. In the example installation, My System is the response.

```
Memory allocation table:

  0K: 00000000 - 00223777 (  37K) : EXEC
 37K: 00224000 - 00237777 (   3K) : RTS (RSX)
 40K: 00240000 - 00757777 (  84K) : USER
124K: 00760000 - End              : NXM

Table suboption? (LF)
```

Explanation — DEFAULT now prints the memory allocation table. At this point you may want to adjust the memory allocation table. If so, go to the memory allocation-related tasks, located in the Conditional Tasks Section of this manual. The example installation goes to the memory allocation-related tasks to perform the Allocate Memory to the Extended Buffer Pool and Allocate Memory to the Small Buffer Pools tasks. After it performs those tasks it continues with the questions asked by DEFAULT.

If you do not need to adjust the memory allocation table, press LINE FEED to this question to continue with this task. You will see the Cache cluster size? question, if you answered Y to the Data Caching? question in Phase 4. Or, you will see the Crash dump? question if you answered N to the question.

```
Cache cluster size <4>?
```

Explanation — This question appears only if you answered Y to the Data Caching? question in Phase 4. This means you have the data caching feature. The data caching feature uses extended buffers, and you should have already allocated at least 2K words of memory to the extended buffer pool by using the XBUF memory allocation table suboption. Before you can use data caching, you must specify the cluster size of the *data cache*, the area of the extended buffer pool that stores information related to read operations. The *cache cluster size* is the number of 512-byte blocks that can be stored in the data cache in one unit. This question tells the RSTS/E monitor how many 512-byte blocks of information to store in the data cache each time a read operation occurs.

Normally you should make the cache cluster size equal to or less than the pack cluster size of the disk with the most activity. (You set the pack cluster size when you initialized your disks.)

You might also want to consider the size of your extended buffer pool. If your extended buffer pool is 20K words, and the cache cluster size is 2 blocks, then about 40 clusters will fit. If the cache cluster size is increased to 8 blocks, then only about 10 clusters fit and response time might be slower. See the *RSTS/E System Manager's Guide* for more information on data caching.

Response — To accept the default of 4, press LINE FEED. Otherwise, type the cache cluster size (1, 2, 4, or 8). In the example installation, there is no response because the response to the Data Caching? configuration question was N.

```
You currently have crash dump enabled.

Crash dump? YES
```

Explanation — DEFAULT first prints the status of the crash dump facility. Your message would read: You currently have crash dump disabled, if you previously used DEFAULT on the same installed monitor and disabled crash dump. *Crash dump* is a software feature that dumps the read/write area of monitor memory and the extended buffer pool to the CRASH.SYS file. You must enable this feature if you ever plan to submit a software performance report (SPR). This question asks if you want to enable this feature. DEFAULT checks that the CRASH.SYS file exists in account [0,1] on your system disk, that it is large enough for your RSTS/E monitor, and that it is contiguous. If the file does not meet all three conditions, DEFAULT prints the warning text: Warning – CRASH.SYS file of xx blocks is not available.

In the example installation, the CRASH.SYS file was created in Phase 2. Because it meets all three conditions, no warning message appears. If a warning message appears, use the CHANGE suboption of REFRESH to adjust the size of CRASH.SYS. (See Phase 2 if you forget how to use these options.)

Response — DIGITAL recommends you enable the crash dump feature by typing YES. Type NO to disable the crash dump feature. If your CRASH.SYS file is not large enough and you enable crash dump anyway, DEFAULT prints no further warning message. In that case, DEFAULT automatically disables crash dump until you create a valid CRASH.SYS file.

```
Magtape labeling <none>? DOS
```

Explanation — This question appears only if your RSTS/E monitor supports magnetic tape drives. It asks for the magnetic tape default labeling, either DOS or ANSI. Individual jobs can change and restore the magnetic tape labeling default during timesharing with the ASSIGN and DEASSIGN commands (described in the *RSTS/E System User's Guide*). Individual programs can set the magnetic tape labeling default with the MODE option of the OPEN statement (described in the *RSTS/E Programming Manual*). To change the system default, however, you must use DEFAULT and answer this question.

Response — To accept the default response, press LINE FEED or type OLD. In the example installation, these responses are not valid because there is no default. If this is the case, type DOS to set the default format to DOS labeling. If your RSTS/E distribution kit is on tape, you must type DOS. (Otherwise, you will not be able to perform any of the build/patch tasks described in Phase 8. You can use the DEFAULT option after you complete Phase 8 to set the magnetic tape labeling default to ANSI, if you so desire.) Type ANSI to set the default format to ANSI standard labeling. In the example installation, DOS is the response because the RSTS/E distribution kit is on tape.

```
Preferred clock <P 100>? (LF)
```

Explanation — Your hardware configuration can include one or both of these system clocks: the *KW11–L Line Time Clock* or the *KW11–P Programmable Real-Time Clock*. The KW11–L Line Clock divides system time into intervals based on the AC line frequency of the power source used to run your PDP–11 computer system. AC line frequency can be either 50 Hz (the standard in many European countries) or 60 Hz (the standard in the United States).

The KW11–P Programmable Real-Time Clock can use the AC line frequency of the power source to provide a system time base, or it can be set to provide a crystal-controlled time base independent of the power source. This clock is useful in areas where fluctuations in AC line frequency would adversely affect system timing.

Response — To accept the default, press LINE FEED. If you have both clocks and the default is not the clock you want, type L to use the KW11–L Line Time Clock, or, type P to use the KW11–P Programmable Real-Time Clock. If you type L, DEFAULT goes to the Date format? question. In the example installation, the response is LINE FEED, which means the system clock is the KW11–P Programmable Real-Time Clock.

```
Interrupt frequency? LINE
```

Explanation — This question appears only if you chose the KW11–P Programmable Real-Time Clock. It asks for the frequency (AC line frequency or the crystal oscillator) you will use for the time base.

Response — DIGITAL recommends you type LINE to use the AC line frequency, unless you live in an area where the line frequency is not accurately maintained by the power supplier (for example, if the power was supplied from diesel generators). In many areas, the AC line frequency is more accurate than the crystal oscillator.

Or, type a number (a multiple of 50 from 50 to 1000 interrupts/second) to use the KW11–P's crystal oscillator for the time base. In the example installation, the response is LINE.

```
Date format <ALPHABETIC>? LF
```

Explanation — This question asks for the date format you prefer: alphabetic or numeric.

Response — Press LINE FEED to accept the default; type A to indicate the alphabetic date format DD–MMM–YY (for example 25–DEC–82); type N to indicate the numeric date format YY.MM.DD (for example, 82.12.25). In the example installation, the response is LINE FEED.

```
Time format <AM/PM>? LF
```

Explanation — This question asks for the time format you prefer: AM/PM or 24–hour. The answers to the Date format? and Time format? questions determine the date and time formats your users will see when they use the system.

Response — Press LINE FEED to accept the default; type AM/PM to indicate AM/PM format (05:13 PM); type 24–hour to indicate military time nn:nn (for example, 17:13).

```
Power fail delay <300>? 60
```

Explanation — This question asks for the number of seconds you want to wait before your RSTS/E monitor attempts to restart. The RSTS/E monitor attempts to recover from a momentary power failure by performing an automatic restart procedure.

You can specify the delay factor (in seconds) before the RSTS/E monitor attempts to restart after a momentary power failure. Specifying a long delay factor ensures that all disk devices are ready before the monitor attempts an automatic restart. (For information on the recovery times required by different RSTS/E devices, consult the appropriate hardware publications. For information on automatic restart procedures refer to the *RSTS/E System Manager's Guide.*)

Response — Type the number (1 to 300) seconds you want to wait before your RSTS/E monitor attempts an automatic restart. In the example installation, the response is 60 seconds, which should be sufficient time for all disk devices to become ready before the RSTS/E monitor attempts an automatic restart.

```
Option:
```

Explanation — After you specify defaults for your RSTS/E monitor, DEFAULT returns to the Option: prompt.

> Go to Task 3.

Table 14: DEFAULT and Memory Allocation Table Error Messages

Message and Meaning
`EXTENDED BUFFER SPACE NOT IN RANGE 00100000 (16K) TO 03777700(511K)` The extended buffer space must fit entirely within the specified range.
`FILE NOT CONTIGUOUS` The file you specified is not contiguous on disk. The primary run-time system file and error message file must be contiguous.
`FILE NOT FOUND` The initialization code did not find the file you specified on disk.
`ILLEGAL FILE NAME` The file name you specified is not one- to six-alphanumeric characters. Specify the correct file name.

(continued on next page)

Table 14: DEFAULT and Memory Allocation Table Error Messages (Cont.)

Message and Meaning
`ILLEGAL 1K SECTION ADDRESS SPECIFIED` The address you specified is not a multiple of 4000(8) or is greater than 1919K (16774000(8)). If you specified a range of addresses, the second of the two addresses must be greater than the first.
`ILLEGAL SUBOPTION GIVEN` Your response to the Table suboption? prompt is not a valid suboption name. Specify a valid suboption name.
`INVALID FILE FORMAT` The error message file you specified is not exactly sixteen blocks long. Make sure you copied from the correct RSTS/E distribution kit.
`INVALID MODULE FORMAT` The run-time system SIL module is too long, too short, or has an upper limit other than 177776(8). Make sure you copied from the correct RSTS/E distribution kit.
`INVALID SIL FORMAT` The run-time system file does not contain a valid SIL index. Make sure you copied from the correct RSTS/E distribution kit.
`MUST FIT ENTIRELY BELOW 124K` The region you specified for the run-time system extends beyond the system's upper limit of 124K.
`NAME MUST BE 1 TO 15 PRINTABLE CHARACTERS` The installation name you typed is more than 15 characters long or contains unprintable characters. You cannot respond by pressing LINE FEED if no previously typed name is available. Type the installation name, making sure you type no more than 15 characters.
`PART OF THAT AREA IS ALREADY IN USE` The region you specified is unavailable for use. Specify another area in memory for that region or move the region currently occupying that area. (You can allocate space marked RTS to the run-time system.)
`PART OF THAT AREA IS NOT LOCKED` Part of the region you specified is not locked; therefore, you cannot unlock it.
`RTS IS NOT A KEYBOARD MONITOR` The run-time system you specified is not a keyboard monitor. RSTS/E requires the primary run-time system be a keyboard monitor (for example, RT11 for the SYSGEN monitor, BASIC–PLUS or RSX for the RSTS/E monitor). Make sure you copied from the correct RSTS/E distribution kit.
`TOO MANY MODULES` The run-time system SIL contains more than one module. If DIGITAL supplied the run-time system, submit a SPR.

Task 3: List File Status Table for RSTS/E Monitor (REFRESH LIST)

Now that you have established defaults for your RSTS/E monitor, your next task is to list the file status table to see if you need to reduce any of the system files you created in Phase 2.

Use the LIST suboption of REFRESH (an INIT.SYS option) to list the file status table.

Terminal Session

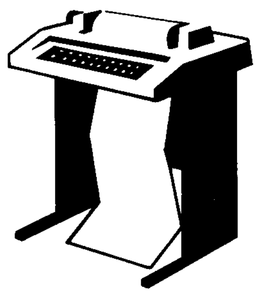


Figure 7 shows how to print the file status table for the system disk. Figure 8 shows how to print the file status table for the nonsystem disk. The responses appear in red next to the question. Remember to enter the device designators and unit numbers of your disks, which may differ from the ones in the example installation.

```
Option: REFRESH
15-DEC-82? (LF)
07:42 AM? (LF)
Disk? DM
Unit? 0
Rebuild? NO

  REFRESH suboption? LIST


  File                    File         Current  Minimum     Start
  Name        Required?   Flags Status   Size     Size       LBN

System files:

  SWAP   .SYS     YES      NOD CTG   OK   3456       64       14001
  SWAP0  .SYS      NO                OK
  SWAP1  .SYS      NO                OK
  SWAP3  .SYS      NO                OK
  OVR    .SYS      NO                OK
  ERR    .SYS      NO                OK                16
  BUFF   .SYS      NO                OK
  CRASH  .SYS      NO      NOD CTG   OK    288      117        1197

Others:

  BADB   .SYS                  NOD           0
  SATT   .SYS              NOD CTG           2                13541
  INIT   .SYS              NOD CTG         535                  241
  ERR    .ERR              NOD CTG          16                  777
  SYSGEN.SIL                   CTG         382                  793
  RT11   .RTS                  CTG          20                 1177
```

(continued on next page)

Figure 7: File Status Table for the System Disk

```
TECO   .RTS              CTG      39          1981
RSTS80.SIL           NOD CTG     369          7153
BASIC  .RTS              CTG      69          8125
RSX    .RTS          NOD CTG      16          8197

REFRESH suboption? (LF)
```

Figure 7: File Status Table for the System Disk (Cont.)

```
Option: REFRESH
15-DEC-82? (LF)
07:45 AM? (LF)
Disk? DM
Unit? 1
Rebuild? NO

  REFRESH suboption? LIST



  File                  File           Current  Minimum    Start
  Name       Required?  Flags Status    Size     Size       LBN

System files:

  SWAP   .SYS     NO                 OK
  SWAP0  .SYS     NO     NOD CTG     OK    1920                 14001
  SWAP1  .SYS     NO                 OK
  SWAP3  .SYS     NO     NOD CTG     OK    1536                 15861
  OVR    .SYS     NO     NOD CTG     OK     182      75         11869
  ERR    .SYS     NO     NOD CTG     OK      16      16         12053
  BUFF   .SYS     NO                 OK
  CRASH  .SYS     NO                 OK

Others:

  BADB   .SYS                NOD            16
  SATT   .SYS            NOD CTG             2                  13541

  REFRESH suboption? (LF)

Option:
```

Figure 8: File Status Table for Nonsystem Disk

Explanation — Check the sizes of your system files by referring to the Minimum Size Column. You can use the CHANGE suboption to reduce these sizes. (If you forget how to use CHANGE, see Task 9 in Phase 2.) In the example installation, the CRASH.SYS file will be reduced from 288 to 120 blocks and the OVR.SYS file will be reduced from 182 to 75 blocks (The CHANGE option is not shown here).

The CRASH.SYS file is important because it prevents you from losing information during a system crash. When a crash occurs, the RSTS/E monitor dumps the contents of the read/write area of monitor memory into CRASH.SYS. Because the crash dump facility preserves the state of the system at the time of the crash, CRASH.SYS contains important diagnostic information.

To figure out the size of CRASH.SYS, check the file status table for the minimum size you need. To get a more accurate size, add the number of blocks that make up the monitor read/write area to the number of blocks that make up the extended buffer pool (XBUF). The size of the monitor read/write area depends on your hardware and software configuration. Use this formula to estimate the number of blocks in the extended buffer pool:

(Size of XBUF in K words * 4) + 1

After you press LINE FEED to the REFRESH suboption? prompt, REFRESH returns to the Option: prompt.

Go to Task 4.

Task 4: Start Your RSTS/E Monitor

This task is similar to the one you performed in Phase 4, where you used the START option to activate your SYSGEN monitor. Now you will use START to activate your RSTS/E monitor.

Terminal Session

To start your RSTS/E monitor, you must answer the questions asked by START. This terminal session lists the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after the question. Type CTRL/C after any question to return to the Option: prompt.

```
Option: START
```

Explanation — You stopped here in the previous task. The Option: prompt now asks you to type the INIT.SYS option that will activate your RSTS/E monitor.

Response — Type START or ST. START lets you override JOB MAX, SWAP MAX, memory allocation, and crash dump defaults for one timesharing session. You can make permanent changes to these defaults only by using the DEFAULT option.

If you do not want to override any defaults, press LINE FEED instead of typing START or ST. When you do this, INIT.SYS omits the default questions, prints a summary of your system defaults, requests the date and time, and then prints the number of disabled devices. In the example installation, the response is START.

```
You currently have JOB MAX = 27, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? NO
```

Explanation — START prints your current JOB and SWAP MAX. If SWAP.SYS does not exist, is not contiguous, or is too small to accommodate the installed monitor, START prints:

```
SWAP.SYS not contiguous or too small

SWAP.SYS not present in [0,1]
```

START prints similar messages for the other system files if similar conditions exist. Use the CHANGE suboption to correct the problem.

Response — Type YES if you need to change either of these; type NO if you do not want to change these. In the example installation, the response is NO.

```
Any memory allocation changes? NO
```

Explanation — START asks if you want to make changes to the memory allocation table for this timesharing session.

Response — Type YES to make changes to the memory allocation table. (See the memory allocation-related tasks in the Conditional Tasks section of this manual.) Type NO if you do not want any changes. In the example installation, the response is NO.

```
You currently have crash dump enabled.

Crash dump? YES
```

Explanation — START asks if you want to enable the crash dump facility. START routines check that the CRASH.SYS file exists in account [0,1] on the system disk, is large enough for the installed RSTS/E monitor and extended buffer pool allocation, and is contiguous on the disk. If the file does not meet all these conditions, START prints one of the following error messages:

```
CRASH.SYS does not exist

CRASH.SYS file of nnn blocks is not available

CRASH.SYS is not contiguous
```

The error message is followed by:

```
Crash dump automatically disabled
```

In the second message, nnn indicates the minimum number of blocks the CRASH.SYS file needs to support the crash dump facility. Use the CHANGE sub-option of REFRESH to change the size.

Response — Type YES to enable the crash dump facility; type NO to disable the crash dump facility. In the example installation, the response is YES.

```
15-DEC-82? (LF)
```

Explanation — START prints the current date.

Response — Press LINE FEED to accept the current date.

```
07:47 AM? (LF)
```

Explanation — START prints the current time.

Response — Press LINE FEED to accept the current time.

```
?Can't find file or account
>
```

Explanation — START pauses for several seconds to:

- Verify that all configured hardware exists and that it responds properly.
- Disable any device it cannot find or that you have disabled with the SET or HARDWR suboptions. If this is the case, START prints the devices it disables. There are none in the example installation.
- Enable all configured terminal controllers and disable any that do not respond.
- Set up monitor tables.
- Turn on memory management.
- Load the installed monitor and run-time system into memory.
- Start the system clock.
- Load the stack limit register, if applicable.
- Enable parity traps for all parity memory.

Then START transfers control to INIT.SYS, which tries to run the INIT.TSK system program (if your primary run-time system is RSX) or INIT.BAC (if your primary run-time system is BASIC–PLUS). Both of these programs are described in the *RSTS/E System Manager's Guide*. Neither program has been created yet. (You will create these programs in Phase 8.)

Because these programs do not exist yet, INIT.SYS prints:

- ?Can't find file or account and an angle bracket (>) prompt if your primary runtime system is RSX. This is what occurs in the example installation.
- ?Can't find file or account, ?Program lost-sorry, and the Ready prompt if your primary run-time system is BASIC–PLUS.

Go to Phase 8.

Phase 8
Build / Patch RSX, System Programs, and Bundled Software

You are now finished building your RSTS/E monitor and BASIC–PLUS run-time system, if you chose it. If RSX is your primary run-time system, you will build it in this phase. (Unlike the BASIC–PLUS run-time system, the RSX run-time system is built by the BUILD program, not by the SYSBAT program.)

This phase explains how to build and patch RSX as a primary or auxiliary run-time system. It also tells how to build and patch system programs and bundled software (RMS–11, SORT, and EDT). The appropriate installation guides describe the building of optional software.

The tasks you perform in this phase are:

- Task 1A: Physically Mount RSTS/E Update Tape
- Task 1B: Physically and Logically Mount RSTS/E Update Disk
- Task 2: Copy Patch Files and Replacement Modules
- Task 3: Build / Patch RSX Primary Run-Time System
- Task 4: Build / Patch System Programs
- Task 5: Build / Patch RSX as Auxiliary Run-Time System
- Task 6: Build / Patch Record Management Services (RMS–11)
- Task 7: Build / Patch SORT Utility Package (SORT)
- Task 8: Build / Patch EDT Text Editor (EDT)

You perform Task 1A and Task 2 if the RSTS/E update kit is on tape; you perform Task 1B and Task 2 if the RSTS/E update kit is on disk—and only if you do not have enough disk drives to simultaneously mount the system disk, the RSTS/E distribution disk, and the RSTS/E update kit.

You perform Task 3 only if your primary run-time system is RSX. Every installation must perform Task 4. Perform Tasks 5 through 8 according to the needs of your installation.

Task 1A: Physically Mount RSTS/E Update Tape

The BUILD program requires that the patches and replacement modules be on disk; therefore, you must mount the RSTS/E update tape and (in Task 2) use the PATCPY program to copy the patches and replacement modules to disk. During Phase 8 it is advantageous to have the following mounted at the same time:

- The system disk (and any nonsystem disks you may have initialized)
- The RSTS/E distribution tape
- The RSTS/E update tape

If your installation does not have enough drives, you may have to mount and dismount several tapes. Chapter 3 of the *RSTS/E Release Notes* tells you the contents of each tape needed for this phase. Always refer to that chapter before you mount or dismount a tape.

Tape Mount Session

To load the tape onto the drive:

1. Mount the tape on a free drive, with the write-enable ring removed. Press the LOAD indicator.
2. The drive automatically winds the tape until the beginning of tape (BOT) indicator light comes on. This indicates the tape is at its load point.
3. Make sure that the write-lock (WR) indicator light is on. (If not, you did not remove the write-enable ring; you must dismount the tape to remove this ring.)
4. Press the ONLINE indicator. The light on this indicator comes on.

Note

The previous instructions may not apply to your tape drive. If not, refer to the hardware manual supplied with your tape drive for the mount instructions.

If you have any nonsystem disks, you must logically mount them now by using the command:

```
MOUNT dev:packID
```

where:

dev:	is the device designator of the nonsystem disk.
pack ID	is the pack ID you specified when you initialized the nonsystem disk in Phase 2 of system generation.

In the example installation there is one nonsystem disk; therefore, the command is:

```
MOUNT DM1:WRKDSK
```

> ☞ Go to Task 2.

Task 1B: Physically and Logically Mount RSTS/E Update Disk

The BUILD program requires that the patches and replacement modules be on disk; therefore, you must perform this task if you do not have enough drives to simultaneously mount the system disk, any nonsystem disks, the RSTS/E distribution kit, and the RSTS/E update disk. If you do have enough drives to simultaneously mount all these, then you can apply the patches and replacement modules directly from the RSTS/E update disk.

Disk Mount Session

To load the RSTS/E update disk onto the disk drive:

1. Physically mount the disk in a free drive.
2. Make sure that the LOAD light is on.
3. Make sure that the WR PROT (write-protect) light is on.
4. Type the following command to logically mount the disk:

```
MOUNT dev:packID/RO
```

where:

dev:	is the device designator of the disk.
pack ID	is the identifier listed in the *RSTS/E Release Notes*.
/RO	is the qualifier for making this disk a read-only device.

Note

The previous load instructions may not apply to your disk drive. If not, see the hardware manual supplied with your disk drive for the mount instructions.

If you have any nonsystem disks you must logically mount them now, using the command:

```
MOUNT dev:packID
```

where:

dev:	is the device designator of the nonsystem disk.
pack ID	is the pack ID you specified when you initialized the nonsystem disk in Phase 2 of system generation.

In the example installation there is one nonsystem disk; therefore, the command is:

```
MOUNT DM1:WRKDSK
```

If your installation does not have enough drives, you may have to mount and dismount a number of disks. Chapter 3 of the *RSTS/E Release Notes* tells you the contents of each disk needed for this phase. Always refer to that chapter before you mount or dismount a disk. Remember that you must logically dismount a disk before physically removing it from the drive, and you must logically mount a disk after physically mounting it on the drive. Use the MOUNT command, as described above, to logically mount a disk. Remember to use the /RO command if the disk you logically mount is a distribution disk.

Use the DISMOUNT command to logically dismount a disk. For example, to logically dismount the nonsystem disk, the response in the example installation would be:

```
DISMOUNT DM1:WRKDSK
```

After you build your system programs in Task 4 of this phase, you can logically dismount disks by using the UTILTY program:

```
RUN $UTILTY
UTILTY V8.0 RSTS V8.0 My System
#DISMOUNT dev: RET
#CTRL/Z
```

Explanation — After you type the command shown in the first line, UTILTY prints a pound sign (#). In response, type DISMOUNT and the device designator of the disk you need to logically dismount. UTILTY logically dismounts the disk and prints another pound sign. Press CTRL/Z to exit the program.

Go to Task 2 if you cannot simultaneously mount the system disk, any nonsystem disks, the RSTS/E distribution kit, and the RSTS/E update disk.

Go to Task 3, if you have enough free drives and your primary run-time system is RSX. (In this case you can apply the patches and replacement modules directly from the RSTS/E update disk.)

Go to Task 4, if you have enough free drives and your primary run-time system is BASIC–PLUS. (In this case you can apply the patches and replacement modules directly from the RSTS/E update disk.)

Task 2: Copy Patch Files and Replacement Modules

Your next task is to copy the patches and replacement modules to disk by running the PATCPY program.

Terminal Session

This terminal session shows how to run PATCPY, explains the questions it asks, and gives some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation. Although the example installation shows the RSX run-time system, you might be running under the BASIC–PLUS run-time system.

```
15-DEC-82? <LF>
07:47 AM? <LF>
?Can't find file or account
RUN MM0:$PATCPY
```

Explanation — In Phase 7, you used START to activate your RSTS/E monitor. As a result, your monitor set up job 1 under the system library account [1,2]. Then it tried to run a start-up program (INIT.BAC for the BASIC–PLUS run-time system or INIT.TSK for the RSX run-time system). There are no system programs in account [1,2] because you have not created them yet. (You will create them in Task 4 of this phase.) The BASIC–PLUS run-time system prints the ?Can't find file or account and ?Program lost-Sorry messages and then prints the Ready prompt. The RSX run-time system prints the ?Can't find file or account message and then prints the angle bracket (>) prompt, as in the example installation.

Response — To run the PATCPY program type:

```
RUN dev:$PATCPY
```

where:

dev: is the device designator of the drive your RSTS/E update tape or disk is mounted on. In the example installation, the response is RUN MM0:$PATCPY.

```
>RUN MM0:$PATCPY
PATCPY V8.0-06 RSTS V8.0-06 MY SYSTEM
Enter distribution device/PPN <SY:[1,2]> : MM0:
```

Explanation — After you type the appropriate command, PATCPY prints header information.

Response — Type the device designator of the drive your RSTS/E update tape or disk is mounted on. Because the RSTS/E update tape is mounted on a TE16 tape drive, the response is MM0: in the example installation.

```
Enter output device/PPN <SY:[200,200]> DM1:[200,200]
```

Explanation — PATCPY asks where you want to store the patches and replacement modules.

Response — Press LINE FEED to store the patches and replacement modules in account [200,200] on your system disk. Otherwise, type the device designator and account of the disk on which you want to store these files. DIGITAL recommends you specify account [200,200]. In the example installation, the response is DM1:[200,200], which means PATCPY will copy the patches and replacement modules to account [200,200] of the nonsystem disk.

```
%Can't find file or account - DM1:[200,200]
Create account DM1:[200,200] <No>? YES
```

Explanation — If the account you specified does not exist, PATCPY prints %Can't find file or account and asks if you want to create this account.

Response — Type YES to have PATCPY create the account. If you type NO or press LINE FEED, PATCPY does not create the account and returns to the previous question, where it expects you to specify another device designator and account number. In the example installation, the response is YES.

```
Account DM1:[200,200] created with your password
Packages to patch? ?
```

Explanation — PATCPY displays a message after it creates the account. Then it asks what patches and replacement modules you want copied to disk. These patches and replacement modules are on control files, located on the RSTS/E update kit.

Response — To find out what control files are available, type a question mark (?) after this question.

```
No packages named?
Valid package names are:

ALL            INIT           SYSGEN    MONITR    BASIC
RJ2780         DECNET         TECO      EXEC      BUILD
BIGPRG         BACKUP         SPLER     DEVTST    DCL
RSX            RT11           RMS       SORT      *STANDARD*
COBOLV4.4      DMS500V2.1     DECAL     DIBOL     DTRV2.4
FORTRAN        F77V4.1        INDENT    3271V2.1
Packages to patch? ALL
```

Explanation — After you type a question mark (?) to the previous question, PATCPY lists the components of the RSTS/E update kit. For example, the list shows that the update disk or tape contains the patches and replacement modules for COBOLV4.4 optional software. If you plan to build this software, copy the COBOLV4.4 patches and replacement modules to disk. (The components of the update kits may change with each update kit, so your list may differ from the one in the example installation.)

Response — Type ALL to have PATCPY transfer all the patches and replacement modules to the specified disk; or, type the names of the individual patch files you want PATCPY to transfer, separating them with commas. In the example installation, ALL is the response. (The patch files and replacement modules may take up a lot of space on the disk, so you may want to specify only the packages you will need.)

```
Other wild card strings? <LF>
```

Explanation — PATCPY asks for the wild card strings. This question is useful if you are creating your own patch kits. It is not applicable here.

Response — Press LINE FEED to ignore the question.

```
Copying MM0:[1,2]PATCHA.DOC to DM1:[200,200]PATCHA.DOC
Copying MM0:[1,2]PATCPY.BAS to DM1:[200,200]PATCPY.BAS
Copying MM0:[1,2]MONITR.CMD to DM1:[200,200]MONITR.CMD
```

Explanation — PATCPY copies the files from account [1,2] of the RSTS/E update tape or disk to the specified account and disk (in the example installation, account [200,200] of the nonsystem disk). As it transfers the files, PATCPY prints the device designator of the drive your update tape or disk is mounted on, the account, and the file it is currently transferring. It also prints the device designator and account of the disk where PATCPY is transferring the files, and the name of the file it has transferred. (Only three lines of the PATCPY printout are shown here.) PATCPY also copies several files in addition to the ones you requested. Do not worry about these; the BUILD program uses only the required files and ignores any additional files.

Response — If you do not want PATCPY to display the files it is copying, type CTRL/O.

```
229 files copied
Copy operation complete
>
```

Explanation — Upon completion, PATCPY prints the number of files (229 in the example installation) it copied and a message declaring the copy is finished. It then returns to the angle bracket (>) prompt if you are running under RSX (or the Ready prompt if you are running under BASIC–PLUS). If you used a RSTS/E update tape, you can remove it now. If you mounted a RSTS/E update disk, PATCPY displays one more question.

```
Logically dismount <dev:> <YES>?
```

Response — To logically dismount the RSTS/E update disk press LINE FEED; otherwise, type NO. In the example installation, there is no response because the RSTS/E update kit is on tape.

Go to Task 3 if your primary run-time system is RSX.

Go to Task 4 if your primary run-time system is BASIC–PLUS.

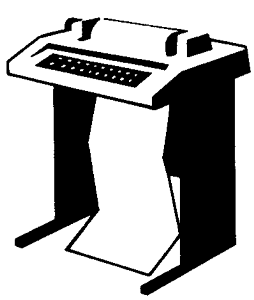
Task 3: Build/Patch RSX Primary Run-Time System

You must perform this task if you chose RSX as your primary run-time system (which means you typed Y to the RSX as primary run-time system? configuration question in Phase 4).

In Phase 5 you ran the SYSBAT program, which built your RSTS/E monitor and the BASIC–PLUS run-time system (if you typed Y to the Generate BASIC–PLUS? configuration question). SYSBAT, however, does not build the RSX run-time system. It merely adds the prerequisite code needed to build RSX.

This task explains how to build and/or patch RSX as a primary run-time system. Before beginning the terminal session, check Chapter 3 of the *RSTS/E Release Notes* for the tape or disk that contains the RSX.CTL control file. This control file contains the commands that BUILD uses to build/patch the RSX run-time system. Follow the tape mount instructions in Task 1A of this phase to mount the correct tape. Follow the disk mount instructions in Task 1B to physically and logically mount the correct disk. Make sure you specify the /RO qualifier to avoid writing to the disk that contains the RSX.CTL control file.

Terminal Session



After you mount the tape or disk that contains the RSX.CTL control file, you are ready to build and/or patch RSX as a primary run-time system. This terminal session shows how to run BUILD, explains the questions, and provides some possible responses. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

Type the following command to run BUILD:

```
RUN dev:$BUILD
```

where:

dev: is the device designator of the tape or disk that contains the RSX.CTL control file.

```
>RUN MM0:$BUILD
BUILD V8.0-06 RSTS V8.0-06 My System
System Build <No>? (LF)
```

Explanation — Note that the device designator in the example installation is MM0:. After you type the RUN command, BUILD prints a heading and the first question, which asks if you want to perform a system build.

Response — Type NO or press LINE FEED, as in the example installation. (You type YES to this question only when you build the system programs associated with the BUILD.CTL control file and only if your primary run-time system is BASIC–PLUS.)

```
Source Input Device <SY:>? MM0:
```

Explanation — This question asks for the location of the RSX.CTL control file.

Response — Type the device designator of the tape or disk that contains the RSX.CTL control file. In the example installation, the response is MM0: because the RSX.CTL control file is on a 1600 BPI tape mounted on a TE16 tape drive.

```
Library output device <SY:>? LF
```

Explanation — This question asks where you want to locate the RSX run-time system after BUILD finishes processing the RSX.CTL control file.

Response — Press LINE FEED to place the programs and files associated with the RSX run-time system on the public disk structure, as in the example installation. If you are generating a RSTS/E monitor for another PDP–11, type the device designator of the drive that contains the disk on which you want to place these programs and files.

```
Target system device <SY0:>? LF
```

Explanation — This question asks for the device designator of your system disk.

Response — Press LINE FEED to place the programs and files associated with the RSX run-time system on the system disk, as in the example installation. If you are generating a RSTS/E monitor for another PDP–11, type the device designator of the drive that contains your system disk.

```
Library account <1,2>? LF
```

Explanation — This question asks for the account in the public disk structure where you want to store the RSX programs and files.

Response — Press LINE FEED to instruct BUILD to place the programs and files associated with the RSX run-time system in account [1,2] of the disk you specified in the two previous questions. DIGITAL recommends this response.

```
Control file is? RSX
```

Explanation — BUILD asks for the name of the control file it needs to build the RSX run-time system.

Response — Type RSX, as in the example installation.

```
*** Copying file MM0:[1,2]RSX.CTL TO BLD01.TMP ***

Locate logical 'LB:' on <SY:[1,1]>? DM1:[1,1]
```

Explanation — BUILD prints a message declaring that it is transferring the RSX.CTL control file from the distribution tape or disk (in the example installation MM0:) to a temporary file (BLD01.TMP) on the system disk. Then BUILD asks if you want to locate the *system-wide logical account LB:* in account [1,1]. The account designated by the system-wide logical name LB: stores some of the files used by the RSX run-time system.

Response — DIGITAL recommends you store account LB: in [1,1] of your system or nonsystem disk. Accept the default by pressing LINE FEED. This places LB: in account [1,1] of your system disk. If you press LINE FEED, BUILD skips the next question. To place LB: on the nonsystem disk, type the device designator and the account number. In the example installation, the response is DM1:[1,1], which means BUILD creates LB: in account [1,1] of the nonsystem disk.

```
%Can't find file or account - DM1:[1,1]
Attempt to create account DM1:[1,1] <No>? YES
```

Explanation — If you do not accept the default in the previous question, BUILD prints a message declaring that it cannot find the file or account you specified. It then asks if you want to create this account.

Response — Type YES to create this account; type NO or press LINE FEED to return to the previous question, in which case BUILD expects you to specify another location for the LB: account. In the example installation, the response is YES.

```
Account DM1: [1,1] created with your password
Function (BUILD/PATCH, PATCH, BUILD) <BUILD/PATCH>? LF
```

Explanation — BUILD prints a message declaring that it has created the account you specified (only if you did not answer LINE FEED to the previous question). It then asks whether you want to build and patch, patch, or build the RSX primary run-time system.

Response — DIGITAL recommends you accept the default by pressing LINE FEED, as in the example installation. By doing so, you instruct BUILD to build and patch the RSX run-time system. (The program builds RSX correctly, even if it finds no RSX patches.) If you want to just build the system programs, type BUILD, in which case the program skips the next two questions.

If you want to just patch the system programs, type PATCH.

```
Patch file input location <SY:[200,200]>? DM1:[200,200]
```

Explanation — BUILD asks for the location of your patch files and replacement modules.

Response — Type the device designator and account [1,2] of your RSTS/E update disk, if it is logically mounted.

If you used PATCPY to transfer patches and replacement modules to another disk, specify the same device designator and account number you specified in Task 2. In the example installation, the response is DM1:[200,200] because the patches and replacement modules were copied to this disk in Task 2.

Press LINE FEED if you accepted the default and stored the patches and replacement modules on the system disk in account [200,200].

```
Save patched sources <NO>? (LF)
```

Explanation — Because of the way BUILD patches and builds RSX, no RSX patched sources are saved. Thus, this question is not applicable to RSX.

Response — Press LINE FEED, as in the example installation.

```
Additional control file is <NONE>? (LF)
```

Explanation — This question asks if you want BUILD to process another control file.

Response — Press LINE FEED, as in the example installation. (Do not respond with NONE because BUILD will search for the NONE.CTL control file, which does not exist.)

```
  .
  .
  .
>!
!END OF BUILD PROCEDURE for RSX
!
>
>
>
!*** BUILD COMPLETE ***
!*** Processing ended on 15-Dec-82 at 08:27 AM ***

>
```

Explanation — BUILD prints output on your console terminal as it builds and/or patches the RSX primary run-time system (the output is not shown here). Upon completion, BUILD prints a message declaring it is finished processing the RSX.CTL control file. It then returns to the angle bracket (>) prompt. Do not unload your distribution tape or disk at this point.

> Go to task 4.

Task 4: Build/Patch System Programs

Your next task is to build and patch *system programs*. These programs allow you to perform different tasks during timesharing. DIGITAL supplies these system programs on the following *control files*:

- BUILD.CTL
- DCL.CTL
- BIGPRG.CTL
- HELP.CTL
- SPLER.CTL
- SPL.CTL
- BACKUP.CTL
- DEVTST.CTL

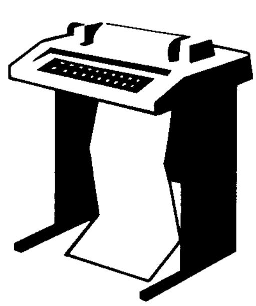
These control files contain commands that, when executed by BUILD, read, patch, and compile system programs and place them in specified accounts. The compiled system programs associated with the BUILD.CTL control file are collectively called the *standard system library*.

You must build the system programs associated with the BUILD.CTL control file. The system programs associated with the other control files are optional. DIGITAL recommends you build the system programs associated with the HELP.CTL and DCL.CTL control files. Please read the *RSTS/E Release Notes* for information concerning the new micro–RSTS spooling package (SPL.CTL).

Before you start building the system programs, check Chapter 3 of the *RSTS/E Release Notes* for the tape or disk that contains the control file(s) you need to process. If there is more than one control file on the tape or disk, make sure you specify the control files in the same order as they appear on the list provided in the *RSTS/E Release Notes*.

Follow the tape mount instructions in Task 1A of this phase to mount the correct tape. Follow the disk mount instructions in Task 1B to physically and logically mount the disk that contains the control files you want to process. Make sure to specify the /RO qualifier to avoid writing to the disk that contains these control files.

Terminal Session



This terminal session shows how to run BUILD, explains the questions BUILD asks, and provides some possible responses. In some cases, your response will differ from the response shown in red in the example installation. Before beginning the terminal session, see Table 15, which compares three methods you can use to build the system programs.

Table 15: Methods for Building System Programs

Run-Time System	Method	Advantages	Disadvantages
BASIC–PLUS	OLD, COMPILE	Takes less disk space than RSX or BASIC–PLUS–2. Uses less memory than BASIC–PLUS–2.	Installation speed is slower than RSX. Performance after installation is slower than RSX or BASIC–PLUS–2.
RSX	CSPCOM	Installation speed is faster than BASIC–PLUS or BASIC–PLUS–2. Performance after installation is better than BASIC–PLUS and about the same as BASIC–PLUS–2.	Takes more disk space than BASIC–PLUS.
BASIC–PLUS–2	OLD, COMPILE, TKB	Performance after installation is better than BASIC–PLUS and about the same as RSX.	Takes more disk and memory space than BASIC–PLUS. Installation speed is slower than BASIC–PLUS or RSX.

You can build the system programs using BASIC–PLUS or RSX as your primary run-time system. Some of you may prefer to build the system programs using the BASIC–PLUS–2 optional software, which uses RSX as the primary run-time system. If so, you must build BASIC–PLUS–2 now, before building any system programs. See the *BASIC–PLUS–2 Installation Guide* for information on how to build BASIC–PLUS–2.

Table 15 also shows that the RSX run-time system uses *CSPCOM*, which are the prebuilt system programs supplied by DIGITAL. Using the prebuilt system programs is faster than using either BASIC–PLUS or BASIC–PLUS–2. In addition, the performance gained after installation is better than BASIC–PLUS.

Now you are ready to build your system programs. As stated previously, you need build only the system programs associated with the BUILD.CTL control file.

Type the following command if your primary run-time system is BASIC–PLUS:

```
RUN dev:$BUILD
```

where:

dev: is the device designator of the drive on which the tape or disk containing the BUILD.CTL control file is mounted.

$BUILD is the program to run.

Type the following command if your primary run-time system is RSX:

```
>RUN SY:$BUILD
```

```
>RUN SY:$BUILD
BUILD V8.0-06 RSTS V8.0-06 My System
System Build? <NO>? (LF)
```

Explanation — After you type the command, BUILD prints a heading and the first question.

Response — Type NO or press LINE FEED, as in the example installation, if your primary run-time system is RSX. Type YES if your primary run-time system is BASIC–PLUS.

```
Source Input Device <SY:>? MM0:
```

Explanation — This question asks for the location of the BUILD.CTL control file.

Response — Type the device designator of the drive that contains the BUILD.CTL control file. In the example installation, the response is MM0: because the BUILD.CTL control file is on a 1600 bpi tape loaded on a TE16 tape drive. Table 16 lists some switches you can append to your answer. You can specify a logfile and the /DETACH switch to print BUILD's output in the logfile rather than on the console terminal. The form of this command is:

```
logfile = dev:/DET[ACH]
```

where:

logfile	is the file where you want to record the BUILD procedure.
dev:	is the device where the BUILD.CTL control file is located.
/DETACH	is the switch that causes BUILD to print the procedure in the logfile rather than on the console terminal.

(DIGITAL recommends that you not use the /DETACH switch until after you build the system programs associated with BUILD.CTL.)

Table 16: Switches for Source Input Device Question

Switch	Meaning
/DEN[SITY]:800	800 bpi magnetic tape density
/DEN[SITY]:1600	1600 bpi magnetic tape density
/PAR[ITY]:ODD	Odd parity for magnetic tape
/PAR[ITY]:EVEN	Even parity for magnetic tape
/DOS	DOS magnetic tape labeling
/ANSI	ANSI magnetic tape labeling
/DET[ACH]	Causes BUILD to detach from the console terminal (KB:)

```
Library output device <SY:>? (LF)
```

Explanation — This question asks where you want to locate the system programs associated with the BUILD.CTL control file.

Response — Press LINE FEED to place the programs and files associated with the BUILD.CTL control file on the public disk structure, as in the example installation. If you are generating a RSTS/E monitor for another PDP–11, type the device designator of the drive that contains the disk on which you want to place these programs and files.

```
Target system device <SY0:>? LF
```

Explanation — This question asks for the device designator of your system disk.

Response — Press LINE FEED to place the programs and files associated with the BUILD.CTL control file on the system disk, as in the example installation. Note that the programs and files associated with BUILD.CTL must reside on the system disk. If you are generating a RSTS/E monitor for another PDP–11, type the device designator of the drive that contains the system disk.

```
Library account <1,2>? LF
```

Explanation — This question asks for the account in the public disk structure where you want to store the system programs associated with BUILD.CTL.

Response — DIGITAL recommends you press LINE FEED to place the system programs associated with BUILD.CTL in account [1,2] of the disk you specified in the two previous questions. This is the response in the example installation. If your primary run-time system is BASIC–PLUS, which means you typed YES to the System build? question, BUILD skips the next question.

```
Control file is? BUILD
```

Explanation — BUILD asks for the name of the control file it needs to build only if your primary run-time system is RSX.

Response — Type BUILD, as in the example installation.

```
*** Copying file MM0:[1,2]BUILD.CTL TO BLD01.TMP ***

Locate logical 'LB:' on <DM1:[1,1]>? LF
```

Explanation — BUILD prints a message declaring that it is transferring the BUILD.CTL control file from account [1,2] of the distribution tape or disk (in the example installation MM0:) to a temporary file (BLD01.TMP) on the system disk. Then BUILD asks if you want to locate the *system-wide logical account LB:* in account [1,1]. The account designated by the system-wide logical name LB: stores some of the files used by the RSX run-time system.

Response — If you built the RSX primary run-time system in Task 3 of this phase, you already answered this question; press LINE FEED, as in the example installation.

If your primary run-time system is BASIC–PLUS you may see a different default. DIGITAL recommends you store account LB: in [1,1] of your system or nonsystem disk. If you press LINE FEED, BUILD stores this account in [1,1] of your system disk. Pressing LINE FEED causes BUILD to skip the next question. To place LB: on the nonsystem disk, type the device designator and the account number.

```
%Can't find file or account - SY:[X,X]
Attempt to create account SY:[X,X] <No>?
```

Explanation — If you did not accept the default in the previous question, BUILD prints a message declaring that it cannot find the file or account you specified. It then asks if you want to create this account. (The Xs represent the account number you specified in the previous question.)

Response — Type Y to create this account; type N or press LINE FEED to return to the previous question, in which case BUILD expects you to specify another location for logical LB:. There is no response in the example installation because LINE FEED was the response to the previous question.

```
Account SY: [X,X] created with your password
Function (BUILD/PATCH, PATCH, BUILD) <BUILD/PATCH>? (LF)
```

Explanation — BUILD prints a message declaring that it has created the account you specified (only if you did not answer LINE FEED to the previous question). It then asks whether you want to build and patch, patch, or build the system programs associated with BUILD.CTL.

Response — DIGITAL recommends you accept the default by pressing LINE FEED, as in the example installation. By doing so you instruct BUILD to build and patch the system programs associated with BUILD.CTL. (BUILD processes the control file properly even if there are no patches or replacement modules.)

If you want to just build the system programs, type BUILD, in which case the program skips the next two questions.

If you have already built a RSTS/E monitor and are installing a new update kit, you may just want to patch the system programs. In this case, type PATCH.

```
Patch file input location <SY:[200,200]>? DM1:[200,200]
```

Explanation — BUILD asks for the location of your patch files and replacement modules.

Response — Type the device designator and account [1,2] of your RSTS/E update disk, if it is logically mounted.

If you used PATCPY to transfer patches and replacement modules to another disk, specify the same device designator and account number you specified in Task 2. In the example installation the response is DM1:[200,200] because the patches and replacement modules were copied to this disk in Task 2.

Press LINE FEED if you accepted the default and stored the patches and replacement modules on the system disk in account [200,200].

```
Save patched sources <NO>? (LF)
```

Explanation — This question asks if you want to save the patched source library programs (the source of the program after the PATCPY applies the patch). If you do not plan to save the patched source library programs do not save them. Reproducing them is not difficult and saving them ties up valuable disk space. However, if you do plan to make changes to these patched source library programs, save them.

Response — Press LINE FEED if you do not want to save the patched sources, as in the example installation. Type YES if you want to save the patced source files. If you press LINE FEED, BUILD skips the next question.

```
Write patched sources to <SY:[200,200]>?
```

Explanation — This question asks where you want to store the patched source files.

Response — Press LINE FEED to store the patch source files on the public disk structure. Or type the device designator and the account number where you want to store the patched source files. In the example installation, there is no response because the answer to the previous question was NO.

```
Run-time system <RSX>? (LF)
```

Explanation — BUILD asks for the name of the primary run-time system; it prints your primary run-time system within brackets.

Response — Press LINE FEED to accept the primary run-time system printed within the brackets. Or, type the name of the primary run-time system you want to use. If you select BASIC–PLUS, BUILD skips the next question.

```
Use CSPCOM <Yes>? (LF)
```

Explanation — This question asks if you want BUILD to use the prebuilt system programs when processing the BUILD.CTL (and any other) control files. Table 15 at the beginning of the terminal session lists the advantages and disadvantages of using the prebuilt system programs.

Response — Press LINE FEED to use the prebuilt system programs to process the BUILD.CTL and any other control files. If you press LINE FEED, BUILD skips the next question. Type NO if you want to use BASIC–PLUS–2 to process the BUILD.CTL and any other control files. If you type NO, BUILD asks the next question.

```
Name of BASIC-PLUS-2 compiler <$BP2IC2>?
```

Explanation — This question appears only if you typed NO to the previous question. It asks for the name and location of the BASIC–PLUS–2 compiler, which you designated when you built BASIC–PLUS–2 before starting this task.

Response — Press LINE FEED to accept the default, or type the name and location you designated when you installed BASIC–PLUS–2. In the example installation, there is no response because the example installation did not build BASIC–PLUS–2.

```
Locate error package on <SY:[1,2]>? DM1:[2,3]
```

Explanation — This question asks where you want to place the RSTS/E Error Package. This package is made up of several programs that can reside in the standard system library account [1,2] or any other account.

Response — Press LINE FEED to have BUILD store this package on the system disk in account [1,2]. If you press LINE FEED, BUILD skips the next question. To avoid cluttering this account, DIGITAL recommends you place this package in an account other than [1,2]. Type the device designator and account number of the disk where you want to store this package. In the example installation, the response is DM1:[2,3], which means BUILD stores the programs that make up the error package in account [2,3] of the nonsystem disk.

```
%Can't find file or account - DM1:[2,3]
Attempt to create account DM1:[2,3] <NO>? YES
```

Explanation — This question asks if you want to create the account you specified in the previous question. Note that BUILD prints the device designator and account number you specified in the previous question.

Response — Type YES to create the account you specified in the previous question. If you change your mind, type NO and the program returns to the previous question. In the example installation, YES is the response, which means BUILD creates the Error Package in account [2,3] on the nonsystem disk.

```
Account DM1:[2,3]created with your password
Additional control file is <NONE>? BIGPRG
```

Explanation — BUILD prints a message declaring that it created the account you specified. Then it asks if you want to process any more control files. Each time you see the Additional control file is? question, check to make sure the control file you want to process is on the disk or tape currently loaded. Because the 1600 bpi tape used in the example installation contains other control files, no other tape need be loaded at this time.

Check the *RSTS/E Release Notes* to see what control files are on the tape or disk you now have mounted. You must specify these control files in the order that they appear in the *RSTS/E Release Notes.* The example installation shows how to build the system programs associated with the BIGPRG.CTL, DCL.CTL, HELP.CTL, SPLER.CTL, BACKUP.CTL, and DEVTST.CTL control files.

If there are no other control files on the tape or disk you now have mounted, press LINE FEED to this question. After BUILD processes the specified control files, you can mount the next disk or tape and process the other control files. Remember to logically dismount the disk if your control files are on disk.

Response — Type BIGPRG if you want to build and patch the system programs created when BUILD executes this control file, providing the control file is located on the disk or tape that is currently mounted. The BIGPRG.CTL control file contains commands that create system programs and data files used with certain peripheral devices and optional software. See Appendix D for a list of these system programs.

```
*** Copying file MM0:[1,2]BIGPRG.CTL/MO:2 to BLD01.TMP ***

Additional control file is <None>? DCL
```

Explanation — After you specify BIGPRG, BUILD displays a message. It then asks for the name of the next control file you want to process. The next control file on the example installation's tape is DCL.CTL.

Response — DIGITAL recommends you type DCL if your installation meets the above conditions. In the example installation, DCL is the response.

```
Type MICRO to have DCL invoke the micro-RSTS spooling package
Type STANDARD to have DCL invoke the standard RSTS/E spooling package

Which spooling package do you wish to support in DCL <STANDARD>? (LF)
```

Explanation — There are two spooling packages available with version 8.0: the micro RSTS spooling package and the standard RSTS/E spooling package. See the *RSTS/E Release Notes* for a discussion of the advantages and disadvantages of these two packages. This question asks which package you want to invoke with DCL.

Response — Press LINE FEED, as in the example installation, if you want DCL to invoke the standard RSTS/E spooling package. Type MICRO if you want DCL to invoke the micro RSTS spooling package. (You must of course build the spooling package you want DCL to invoke by processing the appropriate control file, either SPLER.CTL or SPL.CTL.) See Appendix D for more information on DCL. Appendix D also provides a table that lists the DCL commands and their associated system programs.

```
*** Copying file MM0:[1,2]DCL.CTL/MO:2 to BLD01:TMP ***

Additional Control File is <None>? HELP
```

Explanation — After you specify the DCL.CTL control file and answer the invoke question, BUILD displays a copying message. It then asks you to type the name of the next control file you want to build and patch. The next control file on the example installation's tape is HELP.CTL.

Response — Type HELP if you want to build and patch the system programs associated with this control file, providing the control file is located on the disk or tape currently mounted. The HELP.CTL control file contains commands that create system programs used to display the help text. See Appendix D for a list of these system programs.

```
*** Copying file MM0:[1,2]HELP.CTL/MM0:2 to BLD01.TMP ***

Locate HELP Package on <SY:[1,2]>? DM1:[2,4]
```

Explanation — BUILD prints a message and a question that asks for a location for the system programs associated with the HELP.CTL control file. DIGITAL recommends you locate these system programs in an account other than [1,2] to avoid cluttering the system library account.

Response — Type the device designator and account number where you want to store the system programs associated with HELP.CTL. In the example installation, the response is DM1:[2,4], which means these system programs will be stored on the nonsystem disk in account [2,4]. Or, press LINE FEED to accept the default, in which case BUILD skips the next question.

```
%Can't find file or account - DM1:[2,4]
Attempt to create account DM1:[2,4] <No>? YES
```

Explanation — This question appears if you did not accept the default in the previous question. It asks if you want to create the account you specified in the previous question.

Response — Type YES to create the account; type NO or press LINE FEED if you do not want to create the account. If you press LINE FEED or type NO, BUILD returns to the previous question.

```
Account DM1:[2,4] created with your password
Additional Control File is <None>? SPLER
```

Explanation — BUILD prints a message declaring it has created the account you specified. It then asks you to type the name of the next control file you want to build and patch. In the example installation, the next control file on the tape is SPLER.CTL.

Response — Type SPLER if you want to build and patch the system programs associated with this control file, and providing the control file is on the disk or tape currently mounted. The SPLER.CTL control file contains commands that create system programs used with the Standard RSTS/E spooling package. See Appendix D for a list of these system programs. A micro RSTS spooling package is also available with version 8.0. See the *RSTS/E Release Notes* for a discussion of the advantages and disadvantages of the Standard and micro RSTS spooling packages. Because the example installation plans to support the Standard RSTS/E spooling package, the response is SPLER.

```
*** Copying file MM0:[1,2]SPLER.CTL/MO:2 to BLD01.TMP ***

Locate SPOOLING Package on <SY:[1,2]>? DM1:[2,5]
```

Explanation — After BUILD prints the message, it asks where to store the system programs associated with the SPLER.CTL control file.

Response — Type the device designator and the account number where you want to store the system programs associated with the SPLER.CTL control file. In the example installation, the response is DM1:[2,5], which means the majority of the programs associated with this control file will be stored in account [2,5] on the nonsystem disk.

Note

Some system programs, such as QUE, are always stored in account [1,2], no matter what account you specify to this question.

```
%Can't find file or account - DM1:[2,5]
Attempt to create account DM1:[2,5] <No>? YES
```

Explanation — The question asks if you want to create the account you specified in the previous question.

Response — Type YES to create this account; type NO or press LINE FEED if you do not want to create the account you specified in the previous question. If you type NO or press LINE FEED, the program returns to the previous question. In the example installation, the response is YES.

```
Account DM1:[2,5] created with your password
Additional Control File is <None>? BACKUP
```

Explanation — BUILD prints a message declaring that the account has been created. It then asks for the name of the next control file you want to process. The next control file on the example installation's tape is BACKUP.CTL.

Response — Type BACKUP if you want to build and patch the system programs associated with this control file, and only if the control file is on the disk or tape currently mounted. The BACKUP.CTL control file contains commands that create system programs that make up the BACKUP Package. See Appendix D for a list of the system programs associated with this control file. In the example installation, the response is BACKUP.

```
*** Copying file MM0:[1,2]BACKUP.CTL/MO:2 to BLD01.TMP ***

Locate BACKUP Package on <SY:[1,2]>? DM1:[2,6]
```

Explanation — BUILD prints a message, and asks where to store the system programs associated with BACKUP.CTL.

Response — Type the device designator and account number where you want to store the system programs associated with this control file, if the control file is on the tape or disk currently mounted. In the example installation, the response is DM1:[2,6], which means the majority of the system programs will be stored in account [2,6] on the nonsystem disk.

```
%Can't find file or account - DM1:[2,6]
Attempt to create account DM1:[2,6] <No>? YES
```

Explanation — The question asks if you want to create the account you specified in the previous question.

Response — Type YES to create this account, or type NO or press LINE FEED if you do not want to create this account. If you type NO or press LINE FEED, the program returns to the previous question. In the example installation, the response is YES.

```
Account DM1:[2,6] created with your password
Additional Control File is <None>? DEVTST
```

Explanation — BUILD prints a message declaring that it has created the specified account. Then it asks you to type the name of the next control file you want to build and patch.

Response — Type DEVTST if you want to build and patch the system programs associated with this control file. The DEVTST.CTL control file contains commands that create system programs for the Device Testing Package. See Appendix D for a list of the system programs associated with this control file. In the example installation, the response is DEVTST.

```
*** Copying file MM0:[1,2]DEVTST.CTL/MO:2 to BLD01.TMP ***

Locate DEVTST Package on <SY:[1,2]>? DM1:[2,7]
```

Explanation — BUILD prints the copying message and then asks where to store the system programs associated with this control file.

Response — Type the device designator and account number where you want to store these system programs. In the example installation, the response is DM1:[2,7], which indicates that these system programs will be stored in account [2,7] on the nonsystem disk.

```
%Can't find file or account - DM1:[2,7]
Attempt to create account DM1:[2,7] <No>? YES
```

Explanation — The question asks if you want to create the account you specified in the previous question.

Response — Type YES to create this account or type NO or press LINE FEED if you do not want to create this account. If you type NO or press LINE FEED the program returns to the previous question. In the example installation, the response is YES.

```
Account DM1:[2,7] created with your password
Additional Control File is <None>? (LF)

 .
 .
 .
*** BUILD COMPLETE ***
```

Explanation — After the BUILD program executes these control files and builds, patches, and stores the resulting system programs in the accounts you specified, it prints a message declaring that the process is complete. (The example installation does not show all of the ouput here.) It may take several hours to complete the build if you used BASIC–PLUS–2, over an hour if you used BASIC–PLUS, and about an hour if you used RSX to build the system programs. Times will vary according to the size of your system.

Go to Task 5 if your primary run-time system is BASIC–PLUS, and you need to build RSX as an auxiliary run-time system. Otherwise, go to Phase 9.

If your primary run-time system is RSX, go to Task 6 if you want to build RMS–11. Go to Task 7 if you want to build SORT. Go to Task 8 if you want to build EDT; otherwise, go to Phase 9.

Task 5: Build/Patch RSX as Auxiliary Run-Time System

This task requires you to build RSX as an auxiliary run-time system. You need to perform this task only if your primary run-time system is BASIC–PLUS and the optional or bundled software you plan to install requires RSX. If your primary run-time system is RSX, do not perform this task. Instead, go to Task 6 if you need to build any bundled software. Note that there are no responses in the example installation because RSX has already been built.

Terminal Session

Make sure you mount the disk or tape that contains the RSX.CTL control file. See the *RSTS/E Release Notes* for the location of this file.

Type the following command:

```
RUN SY:$BUILD
BUILD V8.0-06 RSTS V8.0-06 My System
System Build? <NO>?
```

Response — Type NO or press LINE FEED. You already built the system programs associated with BUILD.CTL.

```
Source Input Device <SY:>?
```

Response — Type the device designator of the disk or tape that contains the RSX.CTL control file. Or, press LINE FEED to accept the default.

```
Library output device <SY:>?
```

Response — Press LINE FEED to place the programs and files associated with the RSX run-time system on the public disk structure. If you are generating a RSTS/E monitor for another PDP–11, type the device designator of the drive that contains the disk on which you want to place these programs and files.

```
Target system device <SY0:)?
```

Response — Press LINE FEED to place the programs and files associated with RSX on the system disk. If you are generating a RSTS/E monitor for another PDP–11, type the device designator of the drive that contains your system disk.

```
Library account <1,2>?
```

Response — DIGITAL recommends you press LINE FEED to instruct BUILD to place the programs and files associated with RSX in account [1,2] of the disk you specified in the two previous questions.

```
Control file is?
```

Response — Type RSX.CTL.

```
*** Copying file XXn:[X,X]RSX.CTL TO BLD01.TMP ***

Locate logical 'LB:' on <SY:[X,X]>?
```

Response — You already answered this question in the previous task, so accept the default by pressing LINE FEED.

```
Function (BUILD/PATCH, PATCH, BUILD) <BUILD/PATCH>?
```

Response — DIGITAL recommends you accept the default by pressing LINE FEED. Type BUILD if you just want to build RSX; type PATCH if you just want to patch RSX.

```
Patch file input location <SY:[200,200]>?
```

Response — Type the device designator and account [1,2] of your RSTS/E update disk, if it is logically mounted.

If you used PATCPY to transfer patches and replacement modules to another disk, type the same device designator and account number you specified in Task 2.

Press LINE FEED if you accepted the default and stored the patches and replacement modules on the system disk.

```
Save patched sources <NO>?
```

Response — Press LINE FEED if you do not want to save these patched sources, in which case BUILD skips the next question. Type YES if you want to save them.

```
Write patched sources to <SY:<[200,200]>?
```

Response — Press LINE FEED to store the patch source files on the public structure; or, type the device designator and the account number where you want to store these files.

```
Additional control file is <NONE>?
```

Response — Press LINE FEED.

Go to Task 6 if you want to build RMS–11.

Task 6: Build Record Management Services (RMS–11)

DIGITAL distributes Record Management Services (RMS–11) as part of your RSTS/E distribution kit. This task explains how to build RMS–11. Briefly, *RMS–11* is a set of routines that allows your programs to gain access to and process (add, modify, and delete) records and files. For introductory and user (MACRO–11 and high-level language programmer) information see *RSTS/E RMS–11: An Introduction* and the *RSTS/E RMS–11 User's Guide.* For MACRO–11 programmers, reference information on the RMS–11 operation routines is in the *RSTS/E RMS–11 Macro Programmer's Guide.* The *RSTS/E RMS–11 Utilities* manual provides usage and reference information on the RMS–11 utility programs.

Check Chapter 3 of the *RSTS/E Release Notes* for the tape or disk that contains the RMS11.CTL control file. Follow the tape mount instructions in Task 1A of this phase to mount the correct tape. Follow the disk mount instructions in Task 1B to physically and logically mount the correct disk. (Before you physically remove a disk, make sure you logically remove it first. See Task 1B in the phase if you forget how to logically dismount a disk.)

Terminal Session

After you mount the tape or disk that contains the RMS11.CTL control file, you are ready to build and/or patch RMS–11. This terminal session shows the questions asked by BUILD. You saw most of these questions when you performed Task 4 in this phase. Therefore, see Task 4 if you want an explanation of the questions. BUILD also asks an RMS–11 related question that you have not seen before, and it is explained in this task. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

Type the following command to run BUILD:

```
>RUN SY:$BUILD
BUILD V8.0-06 RSTS V8.0-06 My System
System Build <No>? (LF)
Source Input Device <SY:>? MM0:
Library output device <SY:>? (LF)
Target system device <SY0:)? (LF)
Library account <1,2>? (LF)
Control file is? RMS11
*** Copying file MM0:[1,2]RMS11.CTL TO BLD01.TMP ***
Function (BUILD/PATCH, PATCH, BUILD) <BUILD/PATCH>? (LF)
Patch file input location <SY:[200,200]>? DM1:[200,200]
Save patched sources <NO>? (LF)

The default configuration includes the RMS resident libraries
and all RMS utilities built to use the resident libraries. If
you do not want to use RMS resident libraries answer "NO" to
the question which follows.

If you answer "NO" this procedure will not transfer the default
RMS utility tasks but will rebuild all the utilities (and will
take a significantly longer time).

Do you wish to use the RMS resident libraries <YES>? NO
```

Explanation — This question asks if you want the default configuration, which includes the RMS resident libraries and all RMS utilities built to use the resident libraries.

Response — Press LINE FEED to accept the default response of YES; this means you will include the RMS resident libraries and all RMS utilities.

Type NO, as in the example installation, and the BUILD procedure does not transfer the default RMS utility tasks, but rather rebuilds all the utilities, thus taking a significantly longer time to build RMS–11.

```
Additional control file is <NONE>? (LF)
.
.
.
!END OF INSTALLATION PROCEDURE
!*** BUILD COMPLETE ***
!*** Processing ended on 15-Dec-82 at 10:45 AM ***
>
```

Explanation — After you press LINE FEED to the Additional control file is? question, BUILD executes the RMS11.CTL control file ([1,2]RMS11.CTL). This control file prints a number of informational messages and performs the following steps:

1. Transfers the files from the distribution tape or disk to the accounts and disk you specified to the BUILD questions. The destination accounts are listed in the *RSTS/E Release Notes*.

2. Replaces modules in LB:SYSLIB.OLB with modules included in the concatenated object module RMSFUN.OBJ.

3. Replaces any existing CCL definitions for RMS–11 utilities with CCL definitions for the RMS–11 V2.0 utilities.

4. Removes the run-time system RMS11.RTS. This run-time system is not supported for RMS–11 V2.0.

5. If you answered NO to the question about using RMS resident libraries, the control file taskbuilds each RMS utility, such that the utility uses disk-overlaid RMS.

   If you answered YES to the question about using RMS resident libraries, the control file runs the RMS–11 autoconfiguration task, RMSACF. This task removes any existing RMS–11 resident libraries from memory and installs the RMS–11 V2.0 resident libraries in memory with the NOERROR option.

   RMSACF installs the remote access library, DAPRES, and the local access library, RMSRES. RMSRES logically consists of seven save image libraries (SILs). See the *RSTS/E Release Notes* for more information on the RMS–11 resident libraries.

6. Runs the RMSDES and RMSCNV utilities to create the indexed file in LB:RMSDES.HLP. This file will be the internal HELP file for the RMSDES utility.

7. Displays the message !END OF INSTALLATION PROCEDURE upon completion of the RMS–11 installation.

BUILD then prints the BUILD COMPLETE message declaring it is finished processing the RMS11.CTL control file. It then returns to the angle bracket (>) prompt (or the Ready prompt if your primary run-time system is BASIC–PLUS).

Note

Although you are finished building RMS–11, there are several steps you must perform to the start-up files before you can use RMS–11. See the *RSTS/E Release Notes* for this information.

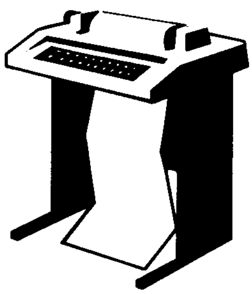
Go to task 7 if you want to build SORT; or go to Task 8 if you want to build EDT. Otherwise go to Phase 9.

Task 7: Build SORT Utility Package

DIGITAL distributes the SORT utility package as part of your RSTS/E distribution kit. This task explains how to build the SORT utility package. Briefly, *SORT* is a set of routines that allows you to read an input file, sort it, and write the data to an output file. See the *PDP–11 SORT Reference Manual* for more information on SORT.

Check Chapter 3 of the *RSTS/E Release Notes* for the tape or disk that contains the SORT.CTL control file. Follow the tape mount instructions in Task 1A of this phase to mount the correct tape. Follow the disk mount instructions in Task 1B to physically and logically mount the correct disk. (Before you physically remove a disk, make sure you logically remove it first. See Task 1B in this phase if you forget how to logically dismount a disk.)

Terminal Session



After you mount the tape or disk that contains the SORT.CTL control file, you are ready to build and/or patch the SORT Utility Package. This terminal session shows the questions asked by BUILD. See Task 4 for an explanation of the questions. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

Type the following command to run BUILD:

```
>RUN SY:$BUILD
BUILD V8.0-06 RSTS V8.0-06 My System
System Build <No>? (LF)
Source Input Device <SY:>? MM0:
Library output device <SY:>? (LF)
Target system device <SY0:)? (LF)
Library account <1,2>? (LF)
Control file is? SORT
*** Copying file MM0:[1,2]SORT.CTL TO BLD01.TMP ***
Function (BUILD/PATCH, PATCH, BUILD) <BUILD/PATCH>? (LF)
Patch file input location <SY:[200,200]>? DM1:[200,200]
Save patched sources <NO>? (LF)
Additional control file is <NONE>? (LF)
.
.
.
>!*** BUILD COMPLETE ***
!*** Processing ended on 15-Dec-82 at 11:15 AM ***
>
```

Explanation — BUILD prints output on your console terminal as it executes the SORT.CTL control file. Upon completion, BUILD prints a message declaring it is finished processing the SORT.CTL control file. It then returns to the angle bracket (>) prompt (or the Ready prompt if your primary run-time system is BASIC–PLUS).

Go to Task 8, if you want to build EDT. Otherwise go to Phase 9.

Task 8: Build EDT Text Editor

DIGITAL distributes the EDT text editor as part of your RSTS/E distribution kit. This task explains how to build the EDT text editor. Briefly, *EDT* is a utility that provides line and character editing, screen editing, and journaling capabilities. See the *Introduction to the EDT Editor* and the *EDT Editor Manual* for more information on EDT.

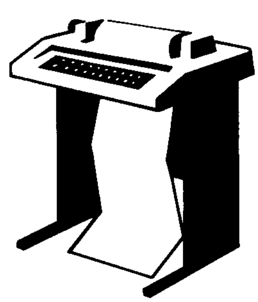
You can build one of three forms of EDT:

- Normal – The *normal EDT configuration* contains no overlays.
- Overlaid – The *overlaid EDT configuration* requires less address space than the normal configuration.
- Multiuser – The *multiuser EDT configuration* allows several users to share one copy of EDT. If you want the multiuser EDT, you must answer YES to the Resident libraries? configuration question. (You should have done this in Phase 4.)

Choose the multiuser configuration if you plan to have more than four users accessing EDT at the same time. Otherwise, choose the normal configuration. The overlaid configuration saves some memory, but its performance is slower than the other two configurations because of the overlay calls.

Check Chapter 3 of the *RSTS/E Release Notes* for the tape or disk that contains the EDT.CTL control file. Follow the tape mount instructions in Task 1A of this phase to mount the correct tape. Follow the disk mount instructions in Task 1B to physically and logically mount the correct disk. (Before you physically remove a disk, make sure you logically remove it first. See Task 1B in this phase if you forget how to logically dismount a disk.)

Terminal Session



After you mount the tape or disk that contains the EDT.CTL control file, you are ready to build and/or patch EDT. This terminal session shows the questions BUILD asks. See Task 4 in this phase if you want an explanation of the questions. After you understand the question, type the response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

Type the following command to run BUILD:

```
>RUN SY:$BUILD
BUILD V8.0-06 RSTS V8.0-06 My System
System Build <No>? (LF)
Source Input Device <SY:>? MMO:
Library output device <SY:>? (LF)
Target system device <SYO:)? (LF)
Library account <1,2>? (LF)
Control file is? EDT
*** Copying file MMO:[1,2]EDT.CTL TO BLD01.TMP ***
```

(continued on next page)

```
Function (BUILD/PATCH, PATCH, BUILD) <BUILD/PATCH>? (LF)
Patch file input location <SY:[200,200]>? DM1:[200,200]
Save patched sources <NO>? (LF)
Additional control file is <NONE>? (LF)



Type "BLD" for normal configuration
Type "OVB" for overlaid configuration
Type "SHR" for shareable (multi-user) configuration



Specify 3-character configuration code <BLD>? BLD
Additional control file is <None>? (LF)
.
.
.
>!*** BUILD COMPLETE ***
!*** Processing ended on 15-Dec-82 at 11:45 AM ***
>
```

Explanation — The only question you have not seen before is Specify 3–character configuration code? See the beginning of this task for information on how to answer this question. Type BLD for the normal EDT configuration; type OVB for the overlaid EDT configuration; type SHR for the multiuser EDT configuration. The response in the example installation is BLD because it does not plan to have more than four users accessing EDT simultaneously.

After you answer the last question, BUILD prints output on your console terminal as it executes the EDT.CTL control file. Upon completion, BUILD prints a message declaring it is finished processing the EDT.CTL control file. It then returns to the angle bracket (>) prompt (or the Ready prompt if your primary run-time system is BASIC–PLUS).

For each EDT configuration, BUILD copies:

- EDT.TSK file (protection code of <104>) to SY:[1,2]
- EDT help file (protection code of <40>) to LB:
- Keypad diagram file (protection code of <40>) to LB:

If you selected the shared version of EDT, the EDT.DOC file is left in the current user account. For the multiuser configuration, BUILD places the resident library in SY:[0,1]EDT.LIB. This library is removed by the REMOVE command of UTILTY before creating the new version, in case you are reinstalling EDT.

You are now finished building EDT. Before you can use EDT, you must do the following:

Add a CCL command to the CCL.CMD command file:

```
RUN $UTILTY
#CCL EDT-=$EDT.TSK
#(CTRL/Z)
```

If you built the multiuser configuration, you also need to use UTILTY to add the resident library, which BUILD places in SY:[0,1]. Be sure to update your start-up files as well. You can use the /C option of SYSTAT to find a suitable address for the 21K library. To add the library type:

```
RUN $UTILTY
#ADD LIBRARY EDT/ADDR:n
#CTRL/Z
```

UTILTY loads EDT into memory in 1K–word sections beginning at the specified address (n). You must use the /ADDR:n switch with the ADD LIBRARY command. UTILTY uses [0,1] as the default account, the public disk structure as the default device, and .LIB as the default file type.

You can now build any optional software you plan to support by referring to the appropriate installation guide. Make sure you check the installation guide for prerequisite software. (For example, some optional software requires the RSX run-time system and RMS–11.)

After you finish building any optional software, go to Phase 9.

Phase 9 Tailor System Files

After you finish Phase 8 you are ready to tailor some system files.

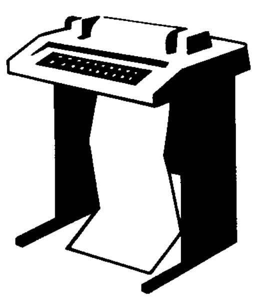
The tasks in this phase are:

- Task 1: Tailor System Message Files (NOTICE.TXT and HELP.TXT)
- Task 2: Tailor Control Files (START.CTL and CRASH.CTL)

Task 1: Tailor System Message Files (NOTICE.TXT and HELP.TXT)

The first task in this phase is to tailor the message file. When you log in, your RSTS/E monitor prints the contents of this file. In this way you can notify your users about the installation or changes and additions to the system. You can maintain this file as needed.

Terminal Session



This terminal session explains how to tailor the system message files NOTICE.TXT and HELP.TXT. Responses in the example installation are in red.

```
RUN $PIP
*NOTICE.TXT


Welcome to RSTS/E V8.0 Time Sharing


*SY:NOTICE.TXT=KB:
E. T. IS YOUR NEW SYSTEM MANAGER.CTRL/Z

*HELP.TXT
TO GET ON-LINE AND USE RSTS/E, FOLLOW
THE INSTRUCTIONS FOUND IN THE
RSTS/E SYSTEM USER'S GUIDE.
```

(continued on next page)

```
*SY:HELP.TXT=KB:
IF YOU HAVE ANY QUESTIONS CALL E. T. AT EXT. 2138.CTRL/Z
*CTRL/Z
>
```

Response — Type RUN $PIP to run the PIP program. PIP prints an asterisk, to which you should type NOTICE.TXT. PIP then prints the contents of the DIGITAL–provided NOTICE.TXT file. At the asterisk prompt, type SY:NOTICE.TXT = KB: to enter the message you want to reside in this file. After you type your message, press CTRL/Z to exit from the file. PIP prints another asterisk.

Now type SY:HELP.TXT = KB: to print the contents of the DIGITAL–provided HELP.TXT file. Then, at the asterisk prompt, type SY:HELP.TXT = KB: to enter the message you want to reside in this file. After you type your message, press CTRL/Z to exit from the file. PIP prints another asterisk. Press CTRL/Z again to exit from PIP.

Go to Task 2.

Task 2: Tailor System Control Files (START.CTL and CRASH.CTL)

Your next task is to tailor the system contol files, START.CTL and CRASH.CTL. The INIT.BAC or INIT.TSK system programs require these two control files whenever they initialize the system for timesharing. DIGITAL provides these two files on the distribution tape or disk, but you may want to make some adjustments to them in order for them to work on your system.

These two control files must contain the information required to properly initialize the system for time-sharing operations.

Terminal Session

This terminal session explains how to print out the DIGITAL–provided START.CTL and CRASH.CTL control files. Responses in the example installation are in red.

Tailor these files as your installation requires, following the instructions presented in the *RSTS/E System Manager's Guide*.

```
RUN $PIP
*START.CTL
```

(SAMPLE FILE PRINTS ON YOUR CONSOLE TERMINAL)

```
*SY0:$START.CTL=KB:
```

(Tailor this file according to the needs of your installation.
Press CTRL/Z to exit from the file.)

```
*CRASH.CTL
```

(SAMPLE FILE PRINTS ON YOUR CONSOLE TERMINAL)

```
*SY0:$CRASH.CTL=KB:
```

(Tailor this file according to the needs of your installation. Press CTRL/Z to exit from the file.)

```
*CTRL/Z
```

Response — Type RUN $PIP to run the PIP program. PIP prints an asterisk, to which you should type START.CTL. PIP then prints the contents of the DIGITAL–provided START.CTL file. At the asterisk prompt, type SY:$START.CTL=KB: to tailor this file according to the needs of your installation. (Another way to tailor your system files is to use EDT or another text editor.)

After you tailor this file, press CTRL/Z to exit from the file. PIP prints another asterisk. Type CRASH.CTL to print the contents of the DIGITAL–provided CRASH.CTL control file. At the asterisk prompt, type SY:CRASH.CTL=KB: to tailor this file. After you finish, press CTRL/Z to exit from the file. PIP prints another asterisk. Press CTRL/Z to exit from PIP.

When you perform these procedures, the monitor replaces the sample file in the system library with your version. Be sure to replace the START.CTL and CRASH.CTL files on the system disk (SY0:).

The sample START.CTL and CRASH.CTL files use the following indirect command files:

- RTS.CMD – installs auxiliary run-time systems.
- TTY.CMD – sets terminal characteristics.
- SPOOL.CMD – initializes spoolers.
- CCL.CMD – defines CCL commands.
- ANALYS.CMD – analyzes crash dumps.
- CLEAN.CMD – logically cleans disks.

See the *RSTS/E System Manager's Guide* for more information about these command files. See the *RSTS/E Release Notes* for information about tailoring the START.CTL file for RMS–11.

Go to Phase 10.

Phase 10
Prepare for Timesharing

This phase discusses the tasks you must perform to prepare your RSTS/E monitor for timesharing:

- Task 1: Create User Accounts
- Task 2: Shut Down RSTS/E Monitor

Task 1: Create User Accounts

The first task requires you to create user accounts on your system disk. To do this you run the REACT program.

Terminal Session

This terminal session explains how to run REACT.

To run this program type:

```
RUN $REACT

REACT    V8.0-06 RSTS V8.0-06 RSTS/E V8.0
System Account Manager
Function? STANDARD
```

Explanation — The REACT program prints a header line and the Function? question. See the *RSTS/E System Manager's Guide* for more information on the REACT program.

Response — Type STANDARD, as in the example installation.

```
Account [1,1] being bypassed
Account [1,2] on System Disk being bypassed
100 0 NORMAL ACCOUNT
All Accounts in Account File are now Entered
Function? CTRL/Z
>
```

Explanation — REACT prints the message that all accounts are entered.

Response — Press CTRL/Z to exit from the program and return to the angle bracket (>) prompt (or Ready if BASIC–PLUS is your primary run-time system).

Go to Task 2.

Task 2: Shut Down RSTS/E Monitor

Your next task is to shut down your RSTS/E monitor. You shut down the monitor in order to ensure you have the correct primary run-time system installed and to ensure that the START.CTL file is working.

Terminal Session

To shut down your monitor, run the SHUTUP program. The instructions are the same for both the BASIC–PLUS and RSX run-time systems.

```
>RUN $SHUTUP

SHUTUP V8.0-06 RSTS V8.0-06 RSTS/E V8.0

11:55 AM 15-Dec-82          Set-up Dialogue Phase

Type 'ESC' ('ALT') to any query to backup one (1) step

'OPSER' not running

Minutes until system shutdown (0-99) <5>? 0
```

Explanation — SHUTUP prints a header and some preliminary information. It then asks you to type the minutes to wait before the RSTS/E monitor shuts down.

Response — Type 0.

```
11:55 AM 15-Dec-82          Warning Message     Phase
Further LOGINs are now disabled


11:55 AM 15-Dec-82          Initial Job Killing Phase

11:55 AM 15-Dec-82          ' EVTLOG ' Shutdown Phase

11:55 AM 15-Dec-82          Remove RTS/RES LIB Phase

11:55 AM 15-Dec-82          SWAP File Removal Phase

11:55 AM 15-Dec-82          Disk    DISMOUNT    Phase

11:55 AM 15-Dec-82          Final   Shutdown    Phase

Please wait for system to re-boot itself


RSTS V8.0-06 RSTS/E V8.0 (DMO) INIT V8.0-06


Option:
```

Explanation — SHUTUP prints several messages before shutting down your system. It then returns to the Option: prompt. See the *RSTS/E System Manager's Guide* for more information on SHUTUP.

Go to Phase 11.

Phase 11
Create Backup of System Disk

This phase requires you to back up your system disk, and consists of one task:

- Task 1: Save System Disk Onto Another Disk or Tape

Task 1: Save System Disk Onto Another Disk or Tape

This task explains how to create a backup of your system disk. The task is divided into two sessions: a Mount and Initialize Session and a Terminal Session.

Mount and Initialize Backup System Disk or Tape

Mount your backup system disk on a free drive and initialize it using the DSKINT option. See the mount and initialize instructions in Phase 2.

If you want to back up to tape, mount a tape on a free drive. See the mount instructions in Phase 2 to mount the tape.

You should also write-protect the drive your system disk is mounted on to avoid destroying the system disk.

Terminal Session

To create a backup system disk, use the SAVRES option of INIT.SYS. This terminal session explains how to answer the questions asked by SAVRES. The SAVRES option is identical to the SAVE/RESTORE system program explained in the *RSTS/E System Manager's Guide*. See that manual if you want more information than this terminal session provides.

```
Option: SAVRES
```

Explanation — DSKINT returns to the Option: prompt after you initialize your backup system disk.

Response — Type SAVRES, as in the example installation.

```
15-Dec-82? (LF)
```

Explanation — SAVRES asks for the current date.

Response — Press LINE FEED to accept the current date.

```
12:05 PM? (LF)
```

Explanation — SAVRES asks for the current time.

Response — Press LINE FEED to accept the current time.

```
SAV/RES Function: IDENTIFY
```

Explanation — SAVRES asks you to specify one of the four functions associated with this option. First, obtain label information from the system disk using the IDENTIFY function.

Response — Type IDENTIFY or ID to make sure the correct disk is mounted.

```
From Device? DM0
```

Explanation — This question asks for the device designator of the drive your system disk is mounted on.

Response — Type the device designator of the drive your system disk is mounted on. In the example installation, the response is DM0.

```
           Device: DM0:
          Pack ID: SYSDSK
 Pack Clustersize: 4
    Creation Date: Wednesday, 15-Dec-82

SAV/RES Function: IDENTIFY
```

Explanation — SAVRES prints the label characteristics of your system disk and returns to the SAV/RES function: prompt. You now want to extract label information from your backup system disk.

Response — Type IDENTIFY or ID.

```
From Device? DM2
```

Explanation — The program asks for the device designator of the drive your backup system disk is mounted on.

Response — Type the device designator of the drive your backup system disk or tape is mounted on. In the example installation, the response is DM2.

```
          Device: DM2
         Pack ID: SYSBAK
Pack Clustersize: 4
   Creation date: Wednesday, 15-Dec-82


SAV/RES Function: IMAGE
```

Explanation — SAVRES prints the label characteristics of your backup system disk. Then it returns to the SAV/RES Function: prompt.

Response — Type SAVE or SA if the disks are not of the same type, or if you are using tape. Type IMAGE if the disks are of the same type, as in the example installation.

The IMAGE function produces a duplicate of your system disk. You can use this duplicate for timesharing, just like the system disk. The SAVE function, however, produces only a backup of your system disk. You must first use the RESTORE function of SAVRES to restore the backup system disk to another disk, which you can then use for timesharing.

```
From RSTS disk? DM0
```

Explanation — The program asks for the device designator and unit number of the drive your system disk is mounted on. Be sure the system disk is write-protected.

Response — Type the device designator and unit number of the drive your system disk is mounted on. In the example installation, the system disk is on DM0.

```
*** Input Pack ID/default Output Pack ID is SYSDSK


To RSTS DM:  Disk?  DM2
```

Explanation — The program prints the pack ID of your system disk and the next question, which asks for the device designator and unit number of your backup system disk or tape.

Response — Type the device designator and unit number of the drive your backup system disk or tape is mounted on. In the example installation, the backup system disk is on DM2.

```
*** The volume on DM2: is a RSTS disk
*** Pack ID is SYSBAK

*** Pack will be reinitialized
Mount it anyway <No>? YES
```

Explanation — The question asks if you want to logically mount your backup system disk. This question gives you a chance to abort the SAVRES operation.

Response — Type YES. If you want to abort the operation, type NO.

```
*** Output Pack ID is SYSDSK

Verify (Yes or No) <No>? YES
```

Explanation — This question asks if you want SAVRES to compare the contents of your system and backup system disks.

Response — Type YES if you want SAVRES to compare these two disks; type NO or press LINE FEED if you do not want SAVRES to compare these two disks. DIGITAL recommends you compare the disks, as in the example installation.

```
Proceed (Yes or No)? YES
```

Explanation — This question asks if you want to proceed with the SAVRES operation.

Response — Type YES to create your backup system disk; type NO if you do not want to create the backup system disk. If you type NO, the program returns to the SAV/RES Function: prompt. In the example installation, the response is YES. After you type YES, the program prints a summary report (not shown here) and then returns to the SAV/RES Function: prompt. Press CTRL/Z to return to the Option: prompt.

Go to Phase 12.

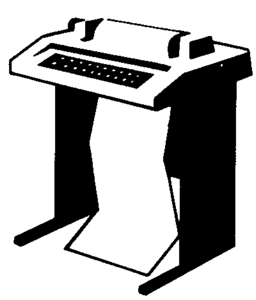
Phase 12 Timesharing

You are now finished with system generation. The task you now perform is to Start Timesharing.

Task 1: Start Timesharing

This explains how to start timesharing.

Terminal Session



This terminal session explains how to use START and LINE FEED to start your RSTS/E monitor.

```
Option: START
```

Explanation — After you created your backup system disk, SAVRES returned to the Option: prompt. You are now ready to start timesharing.

Response — Type START or ST, as in the example installation. To avoid the questions asked by START, press LINE FEED. LINE FEED does not ask any questions, but merely prints the current JOB MAX and SWAP MAX.

```
You currently have: JOB MAX = 27, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? NO
```

Explanation — START prints your current job and swap maximums. It then asks if you want to change either of them for this time-sharing session. (To permanently change these you must use the DEFAULT option.)

Response — Type NO, as in the example installation.

```
Any memory allocation changes? (LF)
```

Explanation — START asks if you want to make any memory allocation changes for this time-sharing session. (Again, to make permanent changes you must use DEFAULT.)

Response — Type NO, as in the example installation.

```
Crash dump? YES
```

Explanation — START asks if you want to enable crash dump.

Response — Type YES.

```
15-Dec-82? (LF)
```

Response — Type the date or press LINE FEED to accept the current date.

```
12:45 PM? (LF)
INIT V8.0-06 RSTS V8.0-06 MY SYSTEM
     Command File Name? START.CTL
.
.
.
>
```

Response — Type the current time or press LINE FEED to accept the current time. START prints heading information and the Command File Name? question. Respond with the name of your command file. In the example installation, the response is START.CTL. After the contents of this file are printed, you will see the prompt of your primary run-time system, either Ready or angle bracket (>).

You are now finished with your installation. Store your distribution kits and backup tape or disk in a safe place.

Note

Remember to use the UTILTY program to add your swap files and any other system files you created in Phase 2. If you do not add these files, particularly the swap files, your system will not work. See the *RSTS/E System Manager's Guide* for instructions on how to add these files.

Conditional Tasks

You perform the tasks in this section according to the needs of your installation. Part One of this manual tells you when to perform these tasks.

The tasks fall into the following categories:

- Hardware-Related Tasks – tasks associated with the HARDWR option of INIT.SYS.
- Device-Related Tasks – tasks associated with the SET option of INIT.SYS.
- Memory Allocation-Related Tasks – tasks associated with the memory allocation table suboptions of INIT.SYS. You can access these suboptions through the DEFAULT or START options of INIT.SYS.
- File Manipulation-Related Tasks – tasks associated with the REFRESH option of INIT.SYS.
- Software Boot-Related Task – the task associated with the BOOT option of INIT.SYS.

Hardware-Related Tasks (HARDWR Suboptions)

Besides providing options for system generation, INIT.SYS also has HARDWR suboptions for performing tasks related to the hardware your RSTS/E monitor supports.

These suboptions affect your system disk, not your installed monitor. Thus, if you add or remove hardware, you may need to use these suboptions again. However, if you merely install a different monitor, you need not use these suboptions again.

The hardware-related tasks are:

- List the Hardware Configuration Table (HARDWR LIST)
- Disable a Device Controller (HARDWR DISABLE)
- Enable a Device Controller (HARDWR ENABLE)
- Declare a Nonstandard Controller Address (HARDWR CSR)
- Declare a Nonstandard Vector Assignment (HARDWR VECTOR)
- Set All Controller Addresses and Vector Assignments to the Standard, and Enable All Devices (HARDWR RESET)
- Declare DM11–BB and DH11 Associations (HARDWR DM)
- Associate a Disk Type With a Controller (HARDWR UNITS)
- Specify AC Line Frequency (HARDWR HERTZ)
- Specify CPU Switch Register Characteristics (HARDWR SWITCH)

You need not perform all of these tasks, only those applicable to your installation. You need not perform these tasks in the order that they appear here. Generally, you perform these tasks before installing your SYSGEN monitor; that is, before performing the tasks in Phase 3.

Go to the task(s) that apply to your installation.

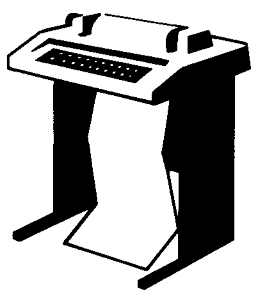
List the Hardware Configuration Table (HARDWR LIST)

This task explains how to list the *hardware configuration table*. This table shows the current hardware configuration and allows you to verify any changes you have made.

You should perform this task if:

- You want to list the current hardware configuration table.
- You need to list the table to see what changes you have made to your hardware configuration.

Terminal Session



To list your hardware configuration type HARDWR at the Option: prompt and LIST at the HARDWR suboption? prompt.

```
Option: HARDWR

HARDWR suboption? LIST

Name    Address Vector  Comments
TTO:    177560  060
RL:     174400  160     Units: 0(RL02) 1(RL01) 2(RL01) 3(RL02)
RM:     177440  210     Units: 0(RK06) 1(RK06) 2(RK07)
TC:     177340  214
TU:     172440  224     Units: 0TE16 @TM03 *00

KW11L   177546  100
KW11P   172540  104
SR      177570
DR      177570


Hertz = 60.

Other: Cache

Hardwr suboption? (LF)
```

Explanation — In the example installation, LIST prints the hardware configuration. (Note that LIST prints only a partial list of the hardware configuration table if you have not installed a monitor or have not performed any of the other tasks in this section.) When you exit from the HARDWR suboption? prompt, INIT.SYS scans the entire hardware configuration and reboots the disk.

If you have changed any of the configured hardware, LIST prints the number of changes that HARDWR will make when you exit from the option. Because there are no changes pending in the example installation, LIST does not print anything.

The hardware configuration table contains one line for each device controller that exists on the system. The table also contains an additional line, printed in parentheses, for each controller that has changes pending. This line appears whether or not the controller has a listing line. Thus, if you declare a nonstandard characteristic for a controller that does not yet exist on the system, HARDWR prints a parenthetical change line noting the change. In addition, the table contains a line for controllers that are currently disabled or nonexistent.

Each line has four columns. The first column contains the name and number of the device controller. The second column includes the address of the controller's CSR set, and the third column contains the controller's vector address. Note that if the device has two vectors, HARDWR prints the lower address; an asterisk (*) precedes a nonstandard CSR or vector address.

In a parenthetical change line, the Address column contains either a nonstandard address or the word SYSTEM. SYSTEM means that INIT.SYS will find the CSR set according to the standard fixed and floating address rules when it bootstraps the system disk. (See Appendix C for a discussion of fixed and floating address rules.) The third column in a change line is blank or contains the nonstandard vector address that you specified.

The fourth column, for any line, supplies information about the controller. Table 17, the hardware comments table, summarizes the comments that may be in the listing for each controller.

Following the hardware configuration table, LIST prints several lines of information. The information reported depends on what hardware your monitor supports and the changes (if any) you have made to the hardware. Table 18 summarizes what you might see on your hardware configuration table.

Response — Type EXIT or press LINE FEED to return to the Option: prompt.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any more tasks in this section, continue with Phase 3.

Table 17: Hardware Comments Table

Device	Comment and Meaning
ALL	Disabled Device is (or will be) disabled.
ALL	Not found Device has a nonstandard CSR set, but did not respond when you last bootstrapped the system.
RF	n platters where n is the number of disk platters present.
RS	BAE= +xxx BAE indicates that the device controller supports 22–bit addressing and has a Bus Address Extension register at the specified offset from its CSR base. units: m(RS03)... t(RS04) m through t are unit numbers of drives that exist on the controller (8 are possible). The disk type appears in parentheses after each unit number. Following the disk type is IL, if that unit interleaves sectors.
RK	RK05F units: n/m n and m are the even and odd unit numbers of the RK05F drive. RK05F units: none No RK05F units are on the system.
RL	units: m(RL01)... p(RL01) m through p are unit numbers of drives that exist on the controller (4 are possible). The disk type appears in parentheses after each unit number.
RM	units: m(RK07)... t(RK07) m through t are unit numbers of drives that exist on the controller (8 are possible). The disk type appears in parentheses after each unit number.
RP	RP03 units: m...t m through t are unit numbers of RP03 disks that exist on the controller. (8 are possible.) Unit numbers of RP02 drives are not listed.
RB,RR	BAE= +xxx BAE indicates that the device controller supports 22–bit addressing and has a Bus Address Extension register at the specified offset from its CSR base. units: m(RM02, RM03, RM05, RM80, RP04, RP05, RP06)... t(RM02, RM03, RM05, RM80, RP04, RP05, RP06) m through t are unit numbers of drives that exist on the controller (8 are possible). The disk type appears in parentheses after each unit number. Following the disk type is DP, if that unit is a dual-ported disk.
RU	units: m(RA60, RA80, RA81)... t(RA60, RA80, RA81) units: m(RC25, RX50)... t(RC25, RX50) unit: m(RD51)

(continued on next page)

Table 17: Hardware Comments Table (Cont.)

Device	Comment and Meaning
TU	BAE= +xxx BAE indicates that the device controller supports 22–bit addressing and has a Bus Address Extension register at the specified offset from its CSR base. units: m(TU16@TM02#X)... t(TU16@TM02#X) m through t are unit numbers of drives that exist on the controller (8 are possible). The tape type, formatter type, and the formatter number appear in parentheses after each unit number. The TU16, TE16, TU45, and TU77 represent the valid device types for the TU controller and the TM02 and TM03 are the valid formatter types. The formatter number (#X) can be any number from 0 to 7.
DM	DHn DH11 controller number n is logically associated with this DM11–BB unit. No DH11 No DH11 controller is logically associated with this DM11–BB unit.

Table 18: Summary Hardware Configuration Table

Mnemonic		Line and Meaning
KW11–L		177546 100 If the system has a KW11–L clock, its address and vector are reported.
KW11–P		172540 104 If the system has a KW11–P clock, its address and vector are reported.
SR		177570 VOLATILE DISABLED If the CPU has a Switch Register, its address is reported. If you have used the SWITCH suboption to specify that the Switch Register is VOLATILE or DISABLED, that choice is reported.
SR		VOLATILE DISABLED The CPU does not have a Switch Register, but you have used the SWITCH suboption to ENABLE or DISABLE it.
(SR		DISABLED) ENABLED VOLATILE There is a pending change from the SWITCH suboption.
DR		177570 If the CPU has a Display Register, its address is reported.
HERTZ	50 60	The system's AC line frequency is always reported.

(continued on next page)

Table 18: Summary Hardware Configuration Table (Cont.)

Mnemonic	Line and Meaning
(HERTZ = 50) 60	There is a pending change to the system's AC line frequency.
CIS	The CPU has the Commercial Instruction Set (CIS) option.
FPU	The CPU has the Floating Point Processor (FPP) option.
FIS	The CPU has the Floating Instruction Set (FIS) option (PDP–11/35 and 11/40 only).
SL	The CPU has a stack limit register.
MED	The CPU has the Maintenance Examine/Deposit instruction (PDP–11/60 only).
CACHE	The CPU has main memory cache.
CACHE W/ADDRESS	The CPU retains address information on a memory fault.
22–BIT ADDRESSING	The CPU supports more than 124KW of memory.
SYSTEM ID = nnnnn	The contents of the CPU identification register are reported, if the register exists.

☞ Go to any other task in this section according to the needs of your installation.

☞ If you do not need to perform any more tasks in this section continue with Phase 3.

Disable a Device Controller (HARDWR DISABLE)

This task explains how to disable a device controller; that is, make it unavailable for use. For example, the RM controller controls all RK06 and all RK07 disk drives. If you disable the RM controller, you disable all RK06 and RK07 disk drives.

You should perform this task if:

- You need to disable a controller that needs repairs.
- You need to disable an erroneously detected controller. For example, you may have installed a TS11 magnetic tape drive at a nonstandard CSR address of 177170. However, INIT.SYS expects to find the RX01/RX02 flexible diskette controller at this address. If you do not use the CSR suboption to declare the TS11 as having a nonstandard CSR, then you must disable the device by disabling the RX (really TS11) controller. In some cases, INIT.SYS interprets a nonstandard device (a device not supported by RSTS) as a normal PDP–11 device. This means INIT.SYS enables the nonexistent PDP–11 device.

Terminal Session

To disable a controller, use the DISABLE suboption of HARDWR. This terminal session lists the questions that DISABLE asks, explains them, and gives you some possible responses. After you understand the questions, type a response at your console terminal. The manual provides a response (printed in red) next to the question. In many cases, your response will differ from the one in the manual.

Press RETURN after a question or prompt to obtain an online explanation. The common HARDWR suboption error messages appear in Table 19, which appears in the Specify CPU Switch Register Characteristics Task. If your error message does not appear there, see Appendix A.

```
Option:  HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks in this section.

Response — Type HARDWR or HA.

```
HARDWR suboption? DISABLE
```

Explanation — HARDWR prints the HARDWR suboption? prompt.

Response — Type DISABLE or DI to disable a controller.

HARDWR DISABLE

```
Controller to disable? ?
```

Explanation — DISABLE asks for the name of the controller to disable. Before you do that, however, it may be useful to list the valid controller names.

Response — Type ? (a question mark), as in the example installation, to list the valid controller names.

```
Name     Max no   Description

 TT         1     Console terminal

 RF         1     RF11 fixed-head disk

 RS         1     RS03/RS04 fixed-head disk

 RK         1     RK05/RK05F disk

 RL         1     RL01/RL02 disk

 RM         1     RK06/RK07 disk

 RP         1     RP02/RP03 disk

 RB         1     RP04/RP05/RP06 disk

 RR         1     RM02/RM03/RM05/RM80 disk

 RU         2      MSCP class disks

 TC         1     TC11 DECtape

 TS         8     TS11/TSV05/TU80 magtape

 TM         1     TU10/TE10/TS03 magtape

 TU         1     TU16/TE16/TU45/TU77 magtape

 PR         8     Paper tape reader

 PP         8     Paper tape punch

 LP         8     Line printer

 RX         4     RX11 flexible diskette

 CR         8     CR11/CM11 card reader

 CD         8     CD11 card reader

 KL        16     KL11/DL11A/DL11B single-line interface

 DL        31     DL11C/DL11D single-line interface

 DE        31     DL11E single-line interface
```

(continued on next page)

```
DP      31   DP11 synchronous line interface

DC      32   DC11 single-line interface

KG       8   KG11 CRC arithmetic unit

DM      16   DM11-BB modem control for DH11

DJ      16   DJ11 16 line multiplexer

DH      16   DH11 16 line multiplexer

DU      16   DU11 single-line synchronous interface

D1      16   DUP11 single-line synchronous interface

XM      16   DMC11/DMR11 interprocessor link

DZ      16   DZ11/DZV11 8 line multiplexer

XK      16   KMC-11 microprocessor

XD      16   DMP11/DMV11 interprocessor link

XN      16   DN11 automatic calling unit interface

DD       4   TU58 DECtape II

Controller to disable? RL
```

Explanation — The first column of this list contains the name of the controller. The second column shows the maximum number of each type of controller that a RSTS/E monitor can support. The third column describes the devices controlled by the controller.

After DISABLE prints the list of valid controllers, it asks for the name of the controller to disable.

Response — Type the two-character name and unit number of the controller you need to disable. Controllers are numbered from 0 to the maximum number possible, minus 1. You can omit the controller number only if the maximum number of that controller is one. For example, you could type RL to this question rather than RL0 because the maximum number of RL controllers that a RSTS/E monitor can support is one. On the other hand, if you need to disable the line printer controller, you have to include the number because the RSTS/E monitor can support more than one line printer controller.

Press CTRL/Z or the LINE FEED key to exit from this suboption without specifying a controller name.

In the example installation, the RL02 controller is faulty; therefore, RL is the response.

HARDWR DISABLE

```
HARDWR suboption? LF
```

Explanation — HARDWR does not immediately disable the controller specified in the previous question, but returns to the HARDWR suboption? prompt. This lets you check your responses by listing the current hardware configuration table.

Response — Type LIST or LI. Type EXIT or press LINE FEED to return to the Option: prompt. Press CTRL/C to cancel any changes and return to the Option: prompt. In the example installation, the response is LINE FEED.

HARDWR makes the indicated changes, bootstraps your system disk, and prints one of three messages:

1. `Option:`

   The Option: prompt indicates you have made no hardware changes or that INIT.SYS has previously completed a scan of the hardware configuration.

2. ```
   nn changes being made
   Rebooting...
   ```

   The value nn represents the number of changes that INIT.SYS will make after it bootstraps the system disk. INIT.SYS scans the entire hardware configuration as it reboots the system disk.

3. ```
   Enabling all devices.
   nn changes pending
   Rebooting...
   ```

   This message indicates that INIT.SYS previously completed only a partial scan of the hardware configuration. The value nn represents the number of changes you have indicated (or it means you have used the RESET suboption). INIT.SYS makes the changes and scans the entire hardware configuration as it reboots the system disk.

Go to any other task in this section according to the needs of your installation.

If you do not need to perform any more tasks in this section, continue with Phase 3.

Enable a Device Controller (HARDWR ENABLE)

This task explains how to enable a device controller, that is, make it available for use. For example, the RM controller controls all RK06 and RK07 disk drives. If you enable the RM controller, you enable all RK06 and RK07 disk drives.

This task is related to the Disable a Device Controller task. In fact, you can look at these two tasks as complements: for every controller you disable with the DISABLE suboption, you can enable with the ENABLE suboption.

You should perform this task if:

- You need to enable a controller that was previously disabled.
- You need to enable a controller automatically disabled by INIT.SYS.

Terminal Session

This terminal session lists the questions that ENABLE asks, explains them, and gives possible responses. After you understand the question, type a response at your console terminal. The manual provides a response (printed in red) next to the question. In some cases, your response will differ from the one in the manual.

Press RETURN after a question or prompt for an online explanation. The common HARDWR suboption error messages appear in Table 19, which appears in the Specify CPU Switch Register Characteristics Task. If your error message does not appear there, see Appendix A.

```
Option: HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

```
HARDWR suboption? ENABLE
```

Explanation — HARDWR prints the HARDWR suboption? prompt.

Response — To enable a controller, type ENABLE or EN.

```
Controller to enable? RL
```

Explanation — ENABLE asks for the name of the controller to enable. Before you do that, however, it may be useful to list the valid controller names by typing a question mark (?). This list contains the name of the controller, the maximum number of each type that the RSTS/E monitor can support, and a description of the controller. (See the Disable a Device Controller Task in this section for an example of this list, or better, print it on your console terminal. The manual does not show this list here.)

Response — Type the two-character name of the controller you need to enable. Controllers are numbered from 0 to the maximum number possible, minus 1. You can omit a controller number only if the maximum number supported by the RSTS/E monitor is 1, as is the case with the RL controller in the example installation. On the other hand, if you need to enable the line printer controller, you have to include the number because the RSTS/E monitor can support more than one line printer controller.

Or, press CTRL/Z to exit from this suboption without specifying a controller name.

In the example installation, the RL02 controller needed to be repaired. Therefore, the RL controller was disabled by following the instructions provided in the previous task. The repairs are complete, and the example installation wants to enable the controller that controls the RL01 and RL02 disk drives.

```
HARDWR suboption? (LF)
```

Explanation — HARDWR does not immediately enable the controller, but returns to the HARDWR suboption? prompt. This lets you check your responses by listing the current hardware configuration table.

Response — Type LIST or LI. Type EXIT or press LINE FEED to return to the Option: prompt. Press CTRL/C to cancel any changes and return to the Option: prompt. In the example installation, the response is LINE FEED. HARDWR makes the specified changes, bootstraps your system disk, and prints one of three messages. These messages are summarized in the Disable a Device Controller Task.

☞	Go to any other task in this section according to the needs of your installation.
☞	If you do not need to perform any more tasks in this section continue with Phase 3.

Declare a Nonstandard Controller Address (HARDWR CSR)

This task explains how to set a nonstandard controller address for a device controller's *Control Status Register (CSR)* set. The CSR set is the unique set of addresses on the UNIBUS associated with a particular device controller. When you bootstrap the INIT.SYS program, it checks the number of each type of controller on the system by applying standard rules for locating the CSR set. See Appendix C for a discussion of the checks performed by INIT.SYS.

You should perform this task only if:

- You need to install a controller at another address because you have nonstandard hardware.
- You need to rearrange device controller addresses.

In general, however, it is not a good idea to assign controllers nonstandard addresses because INIT.SYS may disable the controller, or it may cause the system to crash. Perform this task only as a temporary measure until you have the address assignment corrected.

Terminal Session

To declare a nonstandard controller address use CSR, a HARDWR suboption of INIT.SYS. This terminal session lists the questions, explains them, and gives possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

Press RETURN after a question or prompt for an online explanation. The common HARDWR suboption error messages appear in Table 19 of the Specify CPU Switch Register Characteristics Task. If your error message does not appear there, see Appendix A.

```
Option: HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

HARDWR CSR

```
HARDWR suboption? CSR
```

Explanation — HARDWR prints the HARDWR suboption? prompt.

Response — Type CSR to specify a nonstandard address for a device controller.

```
Controller with non-standard address?
```

Explanation — This question asks for the name of the controller that requires a nonstandard CSR address. Before you do that, however, it may be useful to list the valid controller names by typing a question mark (?). This list contains the name of the controller, the maximum number of each type that the RSTS/E monitor can support, and a description of the devices controlled by the controller. (See the Disable a Device Task in this section for an example of this list, or better, print it on your console terminal.)

Response — Type the two-character controller name and its number. Controllers are numbered from 0 to the maximum possible number of controllers, minus 1. You can omit the controller number only if the maximum number of that controller is one. For example, you could type RL to this question rather than RL0 because the maximum number of RL controllers that the RSTS/E monitor can support is one.

You can also type a question mark (?) to have HARDWR print a list of valid controller names. This list contains the name of the controller, the maximum number of each type that the RSTS/E monitor can support, and a description of the devices controlled by the controller. (See the Disable a Device Controller Task in this section for an example of this list, or better, print it on your console terminal.) In the example installation, there is no response.

```
New controller address?
```

Explanation — This question asks for the nonstandard CSR address for the controller you specified in the previous question.

Response — Type the address of the lowest register in the controller's CSR set. The address must be an even 6-digit octal number greater than 160000. In the example installation, there is no response.

Or, type REMOVE or RE to remove the nonstandard address (if you have used this option before) and revert back to the standard setting.

Press CTRL/Z to return to the HARDWR suboption? prompt without specifying a new CSR address.

```
HARDWR suboption? (LF)

Option:
```

Explanation — HARDWR does not immediately assign the address you specified to the nonstandard controller, but returns to the HARDWR suboption? prompt. This lets you check your responses by listing the current hardware configuration table.

Response — Type LIST or LI. Type EXIT or press LINE FEED to return to the Option: prompt. In the example installation, the response is LINE FEED.

After you type EXIT or press LINE FEED, HARDWR makes the specified changes, bootstraps your system disk, and prints one of three messages. These messages are summarized in the Disable a Device Controller Task.

Go to any other task in this section according to the needs of your installation.

If you do not need to perform any more tasks in this section, continue with Phase 3.

Declare a Nonstandard Vector Assignment (HARDWR VECTOR)

This task tells how to specify a nonstandard vector address for a device controller.

Note

This task is for DIGITAL field service representatives, who might have to perform it during hardware installation.

You should perform this task only if:

- You need to specify a nonstandard vector address for a device controller because INIT.SYS cannot determine its vector.
- The hardware configuration includes more than one card reader or paper tape reader / punch.

A controller's vector address directs the central processor to the proper routines when that controller requests an interrupt. When you bootstrap the system, INIT.SYS checks each device controller's vector address assignment by forcing each device to interrupt. INIT.SYS checks these addresses against a table of reserved locations. If a device does not respond, INIT.SYS prints a message at your console terminal and disables the device.

INIT.SYS also checks whether more than one device has the same vector address. If so, INIT.SYS prints a message:

Vector for Device XXn: (vvv) already in use – device disabled.

where:

vvv represents the octal address of the incorrect vector. INIT.SYS then disables all devices except the first one it finds.

The following are reserved locations for hardware, and cannot be used as device vector assignments:

Address	RSTS/E Usage
0–2	Detection of jumps to 0 and traps to 0
4–36	System trap vectors
40–56	Reload start addresses, failure HALT
100–102	KW11–L line frequency clock vector
104–106	KW11–P programmable crystal clock vector
110–112	Jump to 0 handling
114–116	Memory parity trap vector
144–146	Crash dump handling
234–236	Statistics handling
240–242	PIRQ trap vector
244–246	FPP or FIS exception trap vector
250–252	Memory Management Unit trap vector

Terminal Session

To declare a nonstandard vector assignment use VECTOR, a HARDWR suboption of INIT.SYS. This terminal session lists the questions, explains them, and gives possible responses. After you understand the question, type a response at your console terminal. In some cases, your response will differ from the response shown in red in the example installation.

Press RETURN after a question or prompt to obtain an online explanation. The common HARDWR error messages appear in Table 19 of the Specify CPU Switch Register Characteristics Task. If your error message does not appear there, see Appendix A.

```
Option: HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

```
HARDWR suboption? VECTOR
```

Explanation — HARDWR prints the HARDWR suboption? prompt.

Response — Type VECTOR or VEC.

```
Controller with non-standard vector?
```

Explanation — This question asks for the name of the controller that requires a nonstandard vector address.

Response — Type the two-character controller name and its number. Controllers are numbered from 0 to the maximum possible number of controllers, minus 1. You can omit the controller number only if the maximum number of that kind of controller is one. For example, you could type RL to this question rather than RL0 because the RSTS/E monitor supports only one RL controller.

You can also type a question mark (?) to have HARDWR print a list of valid controller names. This list contains the name of the controller, the maximum number of each type that the RSTS/E monitor can support, and a description of the controller. (See the Disable a Device Controller Task in this section for an example of this list, or better, print it on your console terminal.) In the example installation, there is no response.

```
New vector address?
```

HARDWR VECTOR

Explanation — This question asks for the nonstandard vector address for the controller you specified in the previous question.

Response — Type the nonstandard vector address, which is the 3–digit octal address of the lowest vector for the device controller. The address must be an even number. (See the chart at the beginning of this task for reserved addresses.) In the example installation, there is no response.

Type REMOVE or RE to remove a nonstandard vector address and return to the standard address.

Press CTRL/Z to return to the HARDWR suboption? prompt without specifying a new vector address.

```
HARDWR suboption? (LF)

Option:
```

Explanation — HARDWR does not immediately assign the nonstandard vector address to the controller, but returns to the HARDWR suboption? prompt. This lets you check your responses by listing the current configuration table.

Response — Type LIST or LI. Type EXIT or press LINE FEED to return to the Option: prompt. In the example installation, the response is LINE FEED. After you type EXIT or press LINE FEED, HARDWR makes the specified changes, bootstraps your system disk, and prints one of three messages. These messages are summarized in the Disable a Device Controller Task.

> Go to any other task in this section, according to the needs of your installation.
>
> If you do not need to perform any more tasks in this section, continue with Phase 3.

Set All Vector and CSR Addresses to the Standard, and Enable All Devices (HARDWR RESET)

You should perform this task only if you have made no changes to your hardware, that is, you have not assigned any nonstandard CSR or vector addresses. You can perform this task before installing your SYSGEN monitor (a task in Phase 3) to get a complete list of your hardware.

You use the HARDWR suboption RESET to accomplish this. The RESET option causes INIT.SYS to reboot your system disk and perform a complete hardware scan. Thus, INIT.SYS returns all CSR and vector addresses to their standard addresses, enables all devices, and associates each DM11–BB unit with the DH11 multiplexer that has the same unit number.

Terminal Session

This terminal session tells you how to use RESET.

```
Option: HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

```
HARDWR suboption? LIST
```

Explanation — Before using RESET, always list the current hardware configuration to see if there are any CSR or VECTOR changes. (See the List Hardware Configuration Table Task in this section if you want to see an example of the hardware configuration table. The table is not shown here.)

Response — Type LIST or LI.

```
HARDWR suboption? RESET
```

HARDWR RESET

Explanation — After LIST prints the current hardware configuration, it returns to the HARDWR suboption? prompt.

Response — Type RESET or RE.

```
HARDWR suboption?
```

Explanation — RESET returns all device characteristics to the standard CSR and VECTOR addresses. Then it returns to the HARDWR suboption? prompt.

Response — Type LIST or LI to list the current hardware configuration table. (The hardware configuration table is not repeated in the example installation.) After you list the hardware configuration table, type EXIT or press LINE FEED to return to the Option: prompt.

> Go to any other task in this section according to the needs of your installation.
>
> If you do not need to perform any more tasks in this section continue with Phase 3.

Declare DM11–BB and DH11 Associations (HARDWR DM)

You should perform this task if the DM11–BB modem controllers are not associated with the correct DH11 multiplexers.

This task explains how to associate each DM11–BB modem controller with the correct DH11 multiplexer. To perform this task use DM, a HARDWR suboption of INIT.SYS.

The DH11 multiplexer allows you to connect from 1 to 16 terminals to your PDP–11. In other words, the DH11 multiplexer has 16 lines, numbered from 0 to 15.

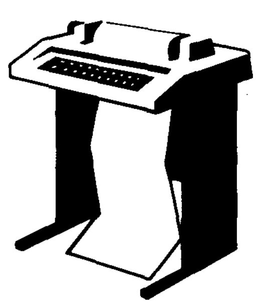
The DM11–BB modem controller allows you to connect a dial-up telephone to the DH11 multiplexer. A DM11–BB modem controller also has 16 lines. A one-to-one relationship exists between these two pieces of hardware, such that a PDP–11 can have only as many DM11–BB modem controllers as there are DH11 multiplexers. (Thus, a PDP–11 can support a maximum of 16 DH11 multiplexers.)

DM11–BB modem controllers and DH11 multiplexers must meet the following conditions:

- A DM11–BB controller's lines can be connected to modem lines on only one DH11 multiplexer. For example, you could not connect the DM11–BB controller lines to DH11 units 0 and 1.
- A DM11–BB controller's line numbers must be the same as the line numbers of its associated DH11 multiplexer. For example, DM11–BB line number 4 can be connected only to DH11 line number 4.

The RSTS/E monitor cannot determine which DM11–BB modem controller is associated with a specific DH11 multiplexer (assuming of course that there is more than one DH11 multiplexer). Therefore, the RSTS/E monitor assumes that DM11–BB unit number 0 is associated with DH11 multiplexer unit 0. The RSTS/E monitor does not require that DM11–BB and DH11 unit numbers be the same. So, you could connect DM11–BB unit number 2 to DH11 unit number 4.

Terminal Session



This terminal session explains how to use the DM suboption.

```
Option:
```

HARDWR DM

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

```
HARDWR suboption? DM
```

Explanation — HARDWR prints the HARDWR suboption prompt.

Response — Type DM, as in the example installation.

```
DH for DM0 (0, NX)?
```

Explanation — This question asks for the unit number of the DH11 multiplexer you want to associate with DM11–BB unit 0. NX means that the unit is nonexistent. The DM suboption requests DH11 unit numbers for all 16 possible DM11–BB units whether or not the system includes 16 units. Therefore, you can logically associate a DH11 unit number with a DM11–BB unit that is not on the system, but is expected in the future.

Response — Type the unit number or press LINE FEED to accept the default. In the example installation, there is no response. The example installation does not need to declare any DM11–BB and DH11 associations.

Press CTRL/Z to return to the HARDWR suboption? prompt and cancel any changes.

```
HARDWR suboption? (LF)

Option:
```

Explanation — DM does not immediately assign the unit numbers of any DH11 multiplexers to their associated DM11–BB modem controllers, but returns to the HARDWR suboption? prompt. It is useful to list the hardware configuration table to verify that these changes will occur.

Response — Type LIST or LI. Type EXIT or press LINE FEED to have DM make the changes and return to the Option: prompt.

Go to any other tasks in this section according to the needs of your installation.

If you do not need to perform any more tasks in this section continue with Phase 3.

Associate a Disk Type With a Controller (HARDWR UNITS)

You should perform this task only if you need to instruct INIT.SYS to recognize a disk as a valid device, even when the disk is disabled.

This could happen as follows:

If a disk drive malfunctions, you must power the drive down, bring it offline, and call field service to fix the drive. If your RSTS/E monitor should go down and then come up again during the time the disk drive is down for repairs, INIT.SYS resets the configuration table to indicate that the disk drive is nonexistent and no longer part of the configuration.

Thus, when the disk drive is fixed and you need to reestablish it as part of your system, you must shut down your RSTS/E monitor and then restart it to allow INIT.SYS to recognize this disk drive as part of the system and add it to the configuration table.

To avoid having to shut down the monitor to recognize this device, you would use the UNITS suboption to identify the disk drives that are to remain a permanent part of your configuration table. The disk drives you specify with this option will not be deleted from the table even if they become disabled.

Note

Do not use the UNITS suboption with the MSCP controller.

Terminal Session

This terminal session explains how to use the UNITS suboption

```
Option: HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

HARDWR UNITS

```
HARDWR suboption? UNITS
```

Explanation — HARDWR prints the HARDWR suboption? prompt.

Response — Type UNITS or UN.

```
Disk to set units for?
```

Explanation — This question asks for the device designator of the disk drive you want to assign permanently to the configuration table. (You can also type the device designator of the drive you have already assigned permanently to this table to remove it from this table.)

Response — Press RETURN to have UNITS print a list of valid disk device designators. Then type the device designator of the appropriate disk. In the example installation, there is no response because the example installation does not need to recognize a disk as a valid device.

```
Unit?
```

Explanation — This question asks for the unit number of the disk you want to assign permanently to this table.

Response — Type the unit number of the drive you specified in the previous question. Possible unit numbers are 0 to the maximum allowed on the controller.

```
Type of this unit?
```

Explanation — Because several kinds of disk drives can be associated with the same device designator, you must specify the type of disk drive.

Response — Press RETURN to have UNITS print a list of valid disk types. Then press LINE FEED, if the disk drive is currently attached to the system.

You can also type REMOVE or RE to delete the disk drive you specified previously. This is the procedure you must follow to allow INIT.SYS to specifically look at the disk you specified UNITS for.

```
Dual-ported?
```

Explanation — This question appears if your response to the previous question was anything other than LINE FEED. It asks if the disk drive you specified is dual-ported.

Response — Press RETURN.

```
Can this drive be accessed by more than one computer?
```

Explanation — Although the RSTS/E monitor cannot use the dynamic dual-ported feature of these disk drives, it needs to know whether the RM02/RM03/RM05/RM80 or the RP04/RP05/RP06 disk drives are dual-ported in order to recognize them when they come online.

Response—Type YES or NO.

```
Interleaved?
```

Explanation — This question appears only if your response to the Type of this unit? question was RS03 or RS04. It asks you to specify whether the disk drive is interleaved. INIT.SYS uses this information to recognize this disk when it comes online.

Response — Type YES if this disk drive is interleaved; type NO if this disk drive is not interleaved.

```
HARDWR suboption?
```

Explanation — UNITS returns to the HARDWR suboption? prompt. It is useful to list the hardware configuration table, to verify that the changes will take place. See the List Hardware Configuration Table Task in this section if you forget how to list this table. Note that the table shows an asterisk (*) next to the device and unit you declared with the UNITS suboption.

Response — Type LIST or LI. Type EXIT or press LINE FEED to return to the Option: prompt.

☞ Go to any other task in this section according to the needs of your installation.

☞ If you do not need to perform any more tasks in this section continue with Phase 3.

Specify AC Line Frequency (HARDWR HERTZ)

You should perform this task only if you need to specify the correct AC line frequency for your system.

Terminal Session

This terminal session explains how to use the HERTZ suboption.

```
Option: HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

```
HARDWR suboption? LIST
```

Explanation — HARDWR prints the HARDWR suboption? prompt.

Response — Before you use the HERTZ suboption, you should list the hardware configuration table. Type LIST or LI. (The hardware configuration table is not shown here, but in the List Hardware Configuration Table Task in this section.)

```
HARDWR suboption? HERTZ
```

Explanation — If the table shows an incorrect AC line frequency for your installation, then you must correct it. The AC line frequency is the basis for all system timing.

Response — Type HERTZ or HE.

`New AC line hertz?`

Explanation — The question asks for the AC line frequency for your installation.

Response — Type 50 if your AC line frequency is 50 Hz (commonly used in Europe); type 60 if your AC line frequency is 60 Hz (commonly used in the United States). The line frequency always defaults to 60 Hz when you install a new monitor. If your installation requires an AC line frequency of 50 Hz, then every time you install a new monitor, you need to use the HERTZ suboption to change the frequency from 60 to 50 Hz.

To avoid having to do this, you can apply a feature patch that sets the default line frequency to 50 Hz. Thus, each time you install a monitor you need not use the HERTZ suboption. You should apply this patch before you install your SYSGEN monitor. Refer to the *RSTS/E Maintenance Notebook* for instructions on how to install this patch.

In addition, if you have previously installed a monitor with an unpatched copy of INIT.SYS, you must use the HERTZ suboption to change the AC line frequency for that monitor. (If the monitor is not currently installed, you must use HERTZ to change its default line frequency the next time you install it.) The default frequency on your system is 50 Hz if you are installing a monitor for the first time and you are using an INIT.SYS that is patched as stated in the *RSTS/E Maintenance Notebook.*

`HARDWR suboption?` LF

Explanation — After you indicate the AC line frequency, you should list the configuration table, to verify that the change will occur.

Response — Type LIST or LI to list the hardware configuration table. Type EXIT or press LINE FEED to return to the Option: prompt.

Go to any other task in this section according to the needs of your installation.

If you do not need to perform any more tasks in this section, continue with Phase 3.

Specify CPU Switch Register Characteristics (HARDWR SWITCH)

You should perform this task only if you want to specify the characteristics of your CPU's console switch register. The console switch register controls:

- The automatic restart feature of RSTS/E during system crashes
- The RSTS/E statistics package

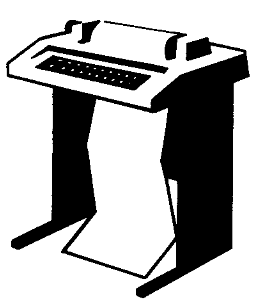
When the monitor crashes (except for power fails), it looks at the switch register. If bit 0 is set to 1, the system performs an autorestart. If bit 0 is not set to 1, (regardless of the setting of the other switches), the system does not start automatically because it looks at the contents of bit 0.

Statistics gathering in the monitor (which you select by answering Y to the Monitor statistics? configuration question) depends on bits 15 and 14 in the switch register (values 100000 and 010000, respectively). These bits have the following meaning:

Bit 15 = 1 Statistics are gathered. Bit 14 is ignored.

Bit 15 = 0 Statistics are not gathered. Bit 14 is not ignored but rather affects the contents of the statistics counters. If bit 15 equals 0 and bit 14 equals 1, the system leaves the values of the current statistics counters untouched. If bit 15 equals 0 and bit 14 equals 0, the system resets all statistical counters to zero.

Terminal Session



This terminal session explains how to use the SWITCH suboption.

```
Option: HARDWR
```

Explanation — You see the Option: prompt if the last task you performed was in Phase 2, or if you exited from the HARDWR suboption? prompt in one of the tasks you performed in this section.

Response — Type HARDWR or HA.

```
HARDWR suboption? SWITCH
```

Explanation — HARDWR prints the HARDWR suboption? prompt.

Response — Type SWITCH or SW.

```
Switch register?
```

Explanation — Because some CPUs do not have switch registers or have switch registers that cannot retain the original register contents after a power failure, SWITCH lets you put the switch register contents in one of three logical positions: ENABLE, DISABLE, or VOLATILE. The response you select and your console switch register setting determine how your system recovers after a system crash. Systems that crash due to power failure have restart capabilities only if they are configured with *nonvolatile memory*—memory that is not destroyed during power failure.

Response — Type DISABLE, ENABLE, or VOLATILE. DISABLE means RSTS/E does not look at the switch register. This means your system, by default, automatically restarts and continues to gather statistics as well. (Note that you must answer Y to the Monitor statistics? configuration question in Task 8 of Phase 4 if you want this feature.)

ENABLE means statistics gathering during timesharing responds to the setting of bits 14 and 15 in the switch register. This means that when the system crashes, RSTS/E looks at the switch register after the crash to see if it should restart.

VOLATILE means statistics gathering during timesharing responds to the setting of bits 14 and 15 in the switch register. VOLATILE has the same meaning as ENABLE except that when power fails, RSTS/E always tries to restart automatically. The ability to restart a RSTS/E system after a power failure depends on the hardware memory configured on your system. Systems with volatile memory cannot perform autorestart, regardless of the switch contents. By specifying VOLATILE, systems with a volatile switch register but with nonvolatile memory can perform restarts after power failure.

```
HARDWR suboption? (LF)
```

Explanation — After you specify the switch register characteristics it is useful to list the hardware configuration table.

Response — Type LIST or LI to list the hardware configuration table. Type EXIT or press LINE FEED to return to the Option: prompt, as in the example installation.

☞ Go to any other task in this section according to the needs of your installation.

☞ If you do not need to perform any more tasks in this section continue with Phase 3.

Table 19: HARDWR Error Messages

Suboption	Message and Meaning
CSR	ADDRESS MUST BE AN EVEN OCTAL NUMBER GREATER THAN 160000. You specified an invalid address. Type an address that meets the requirements.
DISABLE	CANNOT DISABLE CONSOLE TERMINAL You tried to disable the console terminal.
DISABLE	CONTROLLER ALREADY DISABLED You tried to disable a disabled controller.
ENABLE	CONTROLLER NOT DISABLED You tried to enable an enabled controller.
DISABLE, ENABLE,CSR, VECTOR	CONTROLLER NUMBER MISSING You did not specify a controller number for a device that has multiple controllers.
DISABLE, ENABLE,CSR, VECTOR	CONTROLLER NUMBER MUST BE LESS THAN nn The controller number you typed is larger than the maximum of nn.
DM	DH11 ALREADY ASSIGNED TO A DM11-BB The DH11 unit you specified is already assigned to a DM11–BB.
DISABLE, ENABLE,CSR, VECTOR	INVALID CONTROLLER NAME The first two characters you typed did not name a valid device controller. Type ? to obtain a list of valid controller names and try again.
DISABLE, ENABLE,CSR, VECTOR	INVALID CONTROLLER NUMBER The controller number you typed is not an integer. Type the number in the correct format.
DM	INVALID RESPONSE The unit number you specified is not a decimal number from 0 to 15.
VECTOR	VECTOR MUST BE AN EVEN OCTAL NUMBER LESS THAN 1000. You specified an invalid address. Type an address that meets the requirements.

Device-Related Tasks (SET Suboptions)

The INIT.SYS program, in addition to providing options for the tasks associated with system generation, also provides options for the tasks related to specifying characteristics of device units supported by the installed monitor. You may need to perform one or more of these tasks during system generation or during day-to-day system management.

You complete these device-related tasks by using the SET suboptions associated with INIT.SYS. During system generation, you can perform these tasks after you perform Task 1 in Phase 7. The SET suboptions affect the settings of your installed monitor. Thus, if you install a different monitor, you need to use the SET suboptions again if you want to obtain the device characteristics you established with the previously installed monitor.

The device-related tasks you might have to perform during system generation or during day-to-day system management are:

- List Status of Devices (SET LIST)
- Enable Modem Control for Keyboards (SET MODEM)
- Disable Modem Control for Keyboards (SET LOCAL)
- Establish Line Printer Characteristics (SET LP)
- Disable a Device Unit (SET DISABLE)
- Enable a Device Unit (SET ENABLE)
- Set Restrictions on Use of Devices (SET PRIV)
- Remove Restrictions on Use of Devices (SET UNPRIV)

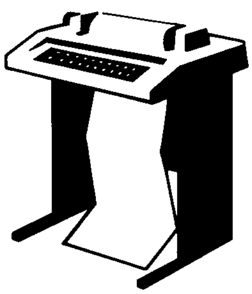
You need not perform all of these tasks, only those applicable to your installation. You need not perform these tasks in the order they appear here.

Go to the task(s) that apply to your installation.

List Status of Devices (SET LIST)

This task tells how to list the status of one or more device units supported by your installed monitor. You should perform this task if you need to verify changes you make when you perform other tasks in this section.

Terminal Session



To list the status of one or more device units, use LIST, a SET suboption of INIT.SYS. This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after the question. The common SET suboption error messages appear in Table 21, located in the Remove Restrictions on Use of Devices Task. If your error message does not appear there, see Appendix A.

```
Option: SET

SET suboption? LIST
```

Explanation — After you install your RSTS/E monitor (Task 1 in Phase 7), the Option: prompt appears. You can now use SET LIST to list the status of devices.

Response — Type SET or SE to the Option: prompt, as in the example installation. SET then displays the SET suboption? prompt. Type LIST or LI. LIST is the response in the example installation.

```
Device? DM
```

Explanation — LIST asks for the device unit or units whose status you want to know.

Response — Type the device designator and unit number to list the status of only one device unit, for example, DM0.

Type only the device designator to list the characteristics of all units of a particular device, for example, DM.

Type the device designator and two unit numbers separating them with a hyphen to list the status of a group of device units, for example, DM1–3.

Type ALL or press LINE FEED to list the status of all units for all the device types supported by your monitor.

In the example installation, the response is DM, which means LIST prints the status of all RK06 / RK07 disk drives supported by this RSTS/E monitor.

```
Name        Control    Comments

DM0         RM:
DM1         RM:
DM2         RM:

SET suboption? LF

Option:
```

Explanation — The Name column contains the device designator and unit number, which in the example installation is DM0 through DM2.

The Control column shows the controller associated with the device. In the example installation, the RM controller is associated with the RK06 / RK07 disk drives.

For terminals and RX11 diskettes, the Control column shows what line and unit a particular terminal or RX11 diskette is attached to. For example, you might see the notation: DH1:4 adjacent to KB32. This means that terminal KB32 is attached to line 4 of the second DH11 multiplexer. (DH lines are assigned numbers 0 to 15.)

For pseudo keyboards, this column contains the number of the pseudo keyboard associated with the keyboard unit. For example, you might see the notation: PK0: adjacent to KB1.

The Comments column shows the status of the unit. For example, if Disabled is in the comments column of DM0, you know that this device was disabled with the DISABLE suboption of SET.

For line printers, the comments column shows printer type (LP or LA180), current line printer settings, current width, and current case.

After LIST diplays the status of one or more device units, it returns to the SET suboption? prompt.

Response — Type EXIT or press LINE FEED to return to the Option: prompt.

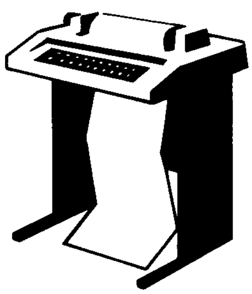
Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any more tasks in this section, go to Phase 7, Task 2 (Establish RSTS/E Monitor Defaults).

Enable Modem Control for Terminals (SET MODEM)

This task tells how to enable modem control on terminals controlled by a DH11 or DZ11/DZV11 multiplexer. You can think of this task and the Disable Modem Control for Terminals Task as complements: every modem controller you enable with MODEM, you can disable with the LOCAL suboption.

Terminal Session



To enable modem control for keyboards use MODEM, a SET suboption of INIT.SYS. This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response given in red in the example installation.

If you want an online explanation, press RETURN after the question. The common SET suboption error messages appear in Table 21 of the Remove Restrictions on Use of Devices Task, the last task in this section. If your error message does not appear there, see Appendix A.

```
Option: SET

SET suboption?
```

Explanation — After you install your RSTS/E monitor (Task 1 in Phase 7), the Option: prompt appears. You can now use SET MODEM to enable modem control for your keyboards.

Response — Type SET or SE to the Option: prompt, as in the example installation. SET then displays the SET suboption? prompt. Type MODEM or MO. Although the example installation has a DH11 multiplexer, it cannot enable modem control because the answer to the Dataset support for DH11's? question in Phase 4 was NO. Therefore, the example installation would press LINE FEED to this question to return to the Option: prompt.

```
KB?
```

Explanation — This question asks for the keyboard numbers of the terminals for which you want to enable modem control. Use the LIST suboption to obtain a list of keyboard numbers.

Response—Type the keyboard number of the terminal for which you want to enable modem control, for example, 1.

Or, type a range of keyboard numbers of the terminals for which you want to enable modem control, for example, 10–12. MODEM continues to print KB? until you press LINE FEED to return to the SET suboption? prompt. In the example installation, there is no response because the example installation cannot enable modem control for the DH11 multiplexer.

```
SET suboption?
```

Explanation — You can now use the LIST suboption to list the status of these terminals. Or, you can press LINE FEED to return to the Option: prompt.

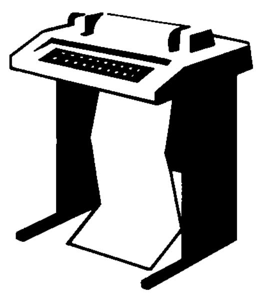
Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any more tasks in this section, go to Task 2 in Phase 7 (Establish RSTS/E Monitor Defaults).

Disable Modem Control for Terminals (SET LOCAL)

This task explains how to disable modem control on terminals controlled by a DH11 DZ11, or DZV11 multiplexer. You can think of this task and the Enable Modem Control for Terminals Task as complements: every modem controller you enable with MODEM, you can disable with LOCAL.

Terminal Session



To disable modem control for terminals, use LOCAL, a SET suboption of INIT.SYS. This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after the question. The common SET suboption error messages appear in Table 21 of the Remove Restrictions on Use of Devices Task, the last task in this section. If your error message does not appear there, see Appendix A.

```
Option: SET

SET suboption?
```

Explanation — After you install your RSTS/E monitor (Task 1 in Phase 7), the Option: prompt appears. You can now use SET LOCAL to disable modem control.

Response — Type SET or SE to the Option: prompt, as in the example installation. SET then displays the SET suboption? prompt. Type LOCAL or LO to disable modem control. (In the example, installation the response to this question would be LINE FEED, since it did not enable modem control.)

```
KB?
```

Explanation — This question asks for the keyboard numbers of the terminals for which you want to disable modem control. Use the LIST suboption to obtain a list of keyboard numbers.

Response — Type the keyboard number of the terminal for which you want to disable modem control, for example, 1.

Or, type a range of keyboard numbers of the terminals for which you want to disable modem control, for example, 10–12. LOCAL continues to print KB? until you press LINE FEED to return to the SET suboption? prompt. (Because the example installation did not enable modem control, there is no response to this question.)

```
SET suboption?

Option:
```

Explanation — You can now use the LIST suboption to list the status of these terminals. Or, you can press LINE FEED to return to the Option: prompt.

Go to any other task in this section, according to the needs of your installation.

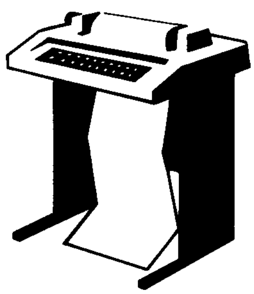
If you do not need to perform any more tasks in this section, go to Task 2 in Phase 7 (Establish RSTS/E Monitor Defaults).

Establish Line Printer Characteristics (SET LP)

This task explains how to adjust line printer characteristics.

You should perform this task if you need to change line printer characteristics, such as printer type, width, and case.

Terminal Session



To change line printer characteristics use LP, a SET suboption of INIT.SYS. This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after the question. The common SET suboption error messages appear in Table 21 of the Remove Restrictions on Use of Devices Task, the last task in this section. If your error message does not appear there, see Appendix A.

```
Option: SET

SET suboption? LP
```

Explanation — After you install your RSTS/E monitor (Task 1 in Phase 7), the Option: prompt appears. You can now use LP to specify line printer characteristics.

Response — Type SET or SE to the Option: prompt, as in the example installation. SET then displays the SET suboption? prompt. Type LP, as in the example installation.

```
Unit?
```

Explanation — This question appears only if you typed a number greater than 1 to the Printers? configuration question in Phase 4.

Response — Type the unit number of the line printer whose settings you want to change. In the example installation, there is no response because only one line printer was configured.

```
Type (NOOMITCR,CR,NOEOT,FILL,NOCONTROL,NO8BIT,BSEMULATE)? LP
```

Explanation — This question appears first if you configured only one line printer. The LP suboption asks you to specify the type of line printer. Note that the current settings appear within parentheses. (These settings are set by DIGITAL and may not be correct for your line printer.) See Table 20 for an explanation of the meaning of these settings.

Response — Press LINE FEED to retain the settings specified within the parentheses.

Or, specify the line printer type: either LP or LA180. If you specify LP, as in the example installation, the default settings are: OMITCR, NOCR, NOEOT, FILL, NOCONTROL, NO8BIT, and BSEMULATE. If you specify LA180, the default settings are: OMITCR, NOCR, NOEOT, FILL, NOCONTROL, NO8BIT, BSREAL.

If your line printer is not a standard DIGITAL line printer, you can specify one or more of the characteristics listed in Table 20 by typing the setting that appears in the left column, and separating them with commas.

Table 20: Settings for LP Suboption of SET

Setting	Meaning
RESET	Resets printer settings to: NOOMITCR, CR, NOEOT, FILL, NOCONTROL, NO8BIT, BSEMULATE.
OMITCR	Omits sending a carriage return (<CR>) if next character is a line feed (<LF>).
NOOMITCR	Always sends a <CR> to the printer.
CR	Inserts a <CR> before a <LF>, a vertical tab (<VT>), and a form feed (<FF>).
NOCR	Instructs the printer to perform an implied <CR> before a <LF>, a <VT>, and a <FF>.
FILL	Inserts fill characters after form feeds.
NOFILL	Fill characters are not required after form feeds.
CONTROL	Sends nonprinting characters to the printer.
NOCONTROL	Discards nonprinting characters or uses up arrow mode.
EOT	Sends an end-of-tape (^D) to the printer.
NOEOT	Treats an end-of-tape like other nonprinting characters.
8BIT	Sends 8–bit characters to the printer. This is a useful setting for the LN01 line printer. If you choose this setting, however, you cannot use MODE value 512%, which enables software formatting for the line printer. (See Chapter 3 of the *RSTS/E Programming Manual.*)

(continued on next page)

Table 20: Settings for LP Suboption of SET (Cont.)

Setting	Meaning
NO8BIT	Does not send 8–bit characters to the printer.
BSEMULATE	Emulates the action of 'backspace' on the printer.
BSREAL	Indicates the printer has an actual backspace (carriage moves left).
BSCONTROL	Treats a backspace like other nonprinting characters.

```
Width? (132) LF
```

Explanation — LP asks for the width setting of the printer.

Response — Press LINE FEED to accept the default of 132 or type a decimal number from 1 to 254 inclusive. In the example installation, the response is LINE FEED.

```
Lower case (yes)? LF
```

Explanation — LP then asks you to specify case setting, that is, whether you want the line printer to output characters in uppercase and lowercase or uppercase only. The default setting is uppercase and lowercase.

Response — Press LINE FEED to accept the default. Or, type NO if you want the uppercase only setting. In the example installation, the response is LINE FEED.

```
SET suboption? LF

Option:
```

Explanation — After you specify the width setting, LP returns to the SET suboption? prompt, unless you have more than one line printer. If so, LP returns to the LP? prompt.

Response — You can now use the LIST suboption to list the device characteristics of your line printer. Or, you can press LINE FEED to return to the Option: prompt, which is the response in the example installation.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform another task in this section, go to Task 2 in Phase 7 (Establish RSTS/E Monitor Defaults).

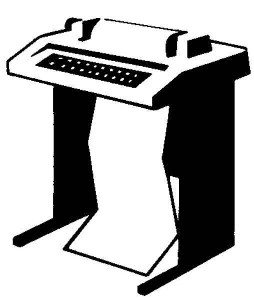
Disable a Device Unit (SET DISABLE)

This task explains how to disable one or more devices (such as disk drives, tape drives, line printer, terminals) and thus make them unavailable for timesharing. You should perform this task if:

- One or more device units have hardware problems.
- You want to configure a device that is not yet installed.You include the device or devices by answering the appropriate configuration question in Phase 4. Then, to suppress the warning messages generated when you start timesharing perform this task.
- A device previously configured is removed from the configuration.

If you attempt to access a disabled device during timesharing, the following message appears: ?Device not available. You can think of this task and the Enable a Device Unit Task as complements: for every device unit you disable with DISABLE, you can enable with the ENABLE suboption of SET.

Terminal Session



To disable a device and make it unavailable for timesharing, use DISABLE, a SET suboption of INIT.SYS.

This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after the question. The common SET suboption error messages appear in Table 21 of the Remove Restrictions on Use of Devices Task, the last task in this section. If your error message does not appear there, see Appendix A.

```
Option: SET

SET suboption? DISABLE
```

Explanation: — After you install your RSTS/E monitor (Task 1 in Phase 7), the Option: prompt appears. You can now use DISABLE to disable any faulty devices.

Response — Type SET or SE to the Option prompt, as in the example installation. SET then displays the SET suboption? prompt. Type DISABLE or DI; the response in the example installation is DISABLE.

```
Device? DL
```

SET DISABLE

Explanation — DISABLE asks for a device designator. You can disable any device unit except the console terminal (KB0:).

Response — Type the device designator of the device. In the example installation, the response is DL.

```
Unit? 1
```

Explanation — DISABLE asks you to specify which unit or units of this device you want to disable.

Response — To disable a single unit of this device, type its unit number, for example, 1.

To disable more than one unit of this device, type a range of unit numbers separated by a hyphen, for example, 1–4.

In the example installation, the response is 1, which means unit 1 of the RL01 disk drive will be disabled.

```
Unit? (LF)
```

Explanation — DISABLE asks if you want to specify another unit or range of unit numbers for this device.

Response — Type another unit number or range of unit numbers. Or, press LINE FEED to return to the Device? question, which is the response in the example installation.

```
Device? (LF)
```

Explanation — This question appears again if you press LINE FEED to the Unit? question.

Response — Type another device designator or press LINE FEED to return to the SET suboption? prompt, which is the response in the example installation.

```
SET suboption? (LF)

Option:
```

Explanation — You can now use the LIST suboption to list the status of the devices you disabled. Or, you can press LINE FEED to return to the Option: prompt, which is the response in the example installation.

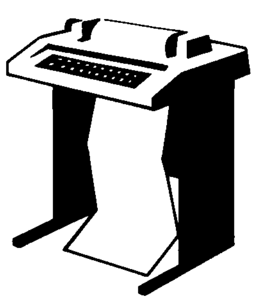
☞ Go to any other task in this section, according to the needs of your installation.

☞ If you do not need to perform another task in this section, go to Task 2 in Phase 7 (Establish RSTS/E Monitor Defaults).

Enable a Device Unit (SET ENABLE)

This task explains how to enable a device unit and thus make it available for timesharing. You should perform this task if you need to enable a device unit that has been previously disabled with the DISABLE suboption of SET. In fact you can think of this task and the Disable a Device Unit Task as complements: every device unit you enable with ENABLE, you can disable with the DISABLE suboption of SET.

Terminal Session



To enable a device unit and make it available for timesharing, use ENABLE, a SET suboption of INIT.SYS.

This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

If you want an online explanation, press RETURN after the question. The common SET suboption error messages appear in Table 21, located in the Remove Restrictions on Use of Devices Task, the last task in this section. If your error message does not appear there, see Appendix A.

```
Option: SET

SET suboption? ENABLE
```

Explanation: — After you install your RSTS/E monitor (Task 1 in Phase 7), the Option: prompt appears. You can now use SET ENABLE to enable any previously disabled devices.

Response — Type SET or SE to the Option: prompt, as in the example installation. SET then displays the SET suboption? prompt. Type ENABLE or EN; the response in the example installation is ENABLE.

```
Device? DL
```

Explanation — ENABLE asks for the device type.

Response — Type the device designator of the device type. Or, type ALL to automatically enable all units of all device types. In the example installation, the response is DL.

```
Unit? 1
```

Explanation — ENABLE asks which unit or units of this device you want to enable.

Response — To enable a single unit of this device, type its unit number, for example, 1.

To enable more than one unit of this device, type a range of unit numbers separated by a hyphen, for example, 1–4.

In the example installation, the response is 1. This means that RL01 disk drive unit 1, disabled in the previous task, is now enabled.

```
Unit? (LF)
```

Explanation — ENABLE asks for another unit or range of units for this device.

Response — Type another unit or range of unit numbers. Or, press LINE FEED to return to the Device? question, which is the response in the example installation.

```
Device? (LF)
```

Explanation — This question appears again if you press LINE FEED to the Unit? question.

Response — Type another device designator or press LINE FEED to return to the SET suboption? prompt, which is the response in the example installation.

```
SET suboption? (LF)
Option:
```

Explanation — You can now use the LIST suboption to list the device characteristics of the units you enabled. Or, you can press LINE FEED to return to the Option: prompt, which is the response in the example installation.

Go to any other task in this section, according to the needs of your installation.

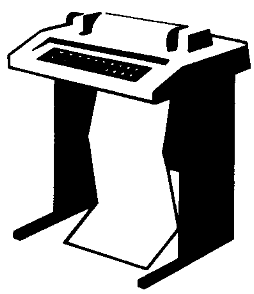
If you do not need to perform another task in this section, go to Task 2 in Phase 7 (Establish RSTS/E Monitor Defaults).

Set Restrictions on Use of Devices (SET PRIV)

This task explains how to place restrictions on the use of one or more device units supported by your RSTS/E monitor. You can restrict the use of any device unit, except disk drives or the *null device*, a nonexistent device used by the RSTS/E monitor for certain device handling functions. To *restrict a device unit* means to make it available only to privileged users.

You should perform this task if you want to make one or more device units available only to privileged users.

Terminal Session



To restrict a device unit and make it available to only privileged users, use PRIV, a SET suboption of INIT.SYS. You can think of this task and the Remove Restrictions on Use of Devices Task as complements: for every device unit you restrict with PRIV, you can remove that restriction with the UNPRIV suboption of SET.

This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

To print an online explanation, press RETURN after the question. The common SET suboption error messages appear in Table 21 of the Remove Restrictions on Use of Devices Task, the last task in this section. If the error message does not appear there, see Appendix A.

```
Option: SET

SET suboption? PRIV
```

Explanation — After you install your RSTS/E monitor (Task 1 in Phase 7), the Option: prompt appears. You can now use SET PRIV to make one or more device units available only to privileged users.

Response — Type SET or SE to the Option: prompt, as in the example installation. SET then displays the SET suboption? prompt. Type PRIV, as in the example installation.

```
Device? KB
```

Explanation — PRIV asks for the device type. You can restrict any device type except disks and the null device.

Response — Type the device designator of the device type you want to restrict. In the example installation, the response is KB. This means nonprivileged users cannot access a particular terminal.

```
Unit? ALL
```

Explanation — PRIV asks which unit or units of this device type you want to restrict.

Response — To restrict a single unit of this device, type its unit number, for example, 1.

To restrict more than one unit of this device, type a range of unit numbers separated by a hyphen, for example, 1–4.

To restrict all units of this device, type ALL. If you type ALL, PRIV returns to the Device? question; otherwise, it returns to the Unit? question.

In the example installation, the response is ALL. This means all terminal units cannot be accessed by nonprivileged users.

```
Device? LF
```

Explanation — PRIV makes the specified changes and asks you to specify another device type. (If you did not indicate ALL to the previous question, then Unit? appears. You can specify another unit or range of unit numbers. Or, press LINE FEED to return to the Device? question.)

Response — Type the device designator of another device type. Or, press LINE FEED to return to the SET suboption? prompt, which is the response in the example installation.

```
SET suboption? LF
Option:
```

Response — You can now use the LIST suboption to list the device characteristics of the device unit or units you restricted. Or, you can press LINE FEED to return to the Option: prompt, which is the response in the example installation.

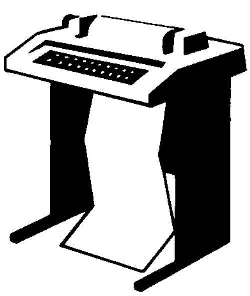
> Go to any other task in this section, according to the needs of your installation.
>
> If you do not need to perform another task in this section, go to Task 2 in Phase 7 (Establish RSTS/E Monitor Defaults).

Remove Restrictions on Use of Devices (SET UNPRIV)

This task explains how to remove restrictions on the use of one or more device units supported by your RSTS/E monitor. To *remove restrictions on a device unit* means to make it available to nonprivileged users.

You should perform this task if you want to make one or more device units available to nonprivileged users.

Terminal Session



To remove restrictions on a device unit and make it available to nonprivileged users, use UNPRIV, a SET suboption of INIT.SYS. You can think of this task and the previous task as complements: every device unit you restrict with the PRIV suboption, you can remove that restriction with UNPRIV.

This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response shown in red in the example installation.

To obtain an online explanation, press RETURN after a question. The common SET suboption error messages appear in Table 21 of this task. If the error message does not appear there, see Appendix A.

```
Option: SET

SET suboption? UNPRIV
```

Explanation — After you install your RSTS/E monitor, the Option: prompt appears. You can now use SET UNPRIV to make one or more device units available to non-privileged users.

Response — Type SET or SE to the Option: prompt, as in the example installation. SET then prints the SET suboption? prompt. Type UNPRIV, as in the example installation.

```
Device? KB
```

Explanation — UNPRIV asks for the device type.

Response — Type the device designator of the device type whose units you want to remove restrictions from. In the example installation, the response is KB. Or, type ALL to remove restrictions from all device units. If you specify ALL, UNPRIV returns to the SET suboption? prompt rather than the next question.

```
Unit? ALL
```

Explanation — UNPRIV asks which unit or units of this device you want to make available to nonprivileged users.

Response — To remove restrictions from a single unit of this device, type its unit number, for example, 1.

To remove restrictions from more than one unit of this device, type a range of unit numbers separated by a hyphen, for example, 1–4.

To remove restrictions from all units of this device, type ALL. If you type ALL, UNPRIV returns to the Device? question; otherwise, it returns to the Unit? question.

In the example installation, the response is ALL. This means all terminal units restricted in the previous task are now accessible to nonprivileged users.

```
Device? (LF)
```

Explanation — UNPRIV makes the specified changes and asks for another device type. (If you did not indicate ALL to the previous question, then the Unit? question appears. You can specify another unit or range of unit numbers. Or, press LINE FEED to return to the Device? question.)

Response — Type the device designator of another device type. Or, press LINE FEED to return to the SET suboption? prompt. In the example installation, the response is LINE FEED.

```
SET suboption? (LF)

Option:
```

Response — You can now use the LIST suboption to list the device characteristics of the device units you removed restrictions from. Or, you can press LINE FEED to return to the Option: prompt, which is the response in the example installation.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform another task in this section, go to Task 2 in Phase 7 (Establish RSTS/E Monitor Defaults).

Table 21: SET Error Messages

Suboption	Message and Meaning
DISABLE	`CAN'T DISABLE KB0:` You specified KB0:, which cannot be disabled.
MODEM, LOCAL	`INVALID KEYBOARD NUMBER` The keyboard number you typed is greater than the maximum allowed.
MODEM, LOCAL, LP	`INVALID RESPONSE` The number you typed is in an incorrect format.
ENABLE, DISABLE, PRIV, UNPRIV	`INVALID RESPONSE` The device you specified is not configured in the installed monitor SIL. Use the LIST suboption to obtain a list of valid device names.
ENABLE, DISABLE, LP, PRIV, UNPRIV	`INVALID UNIT NUMBER` The unit number you typed is not a decimal number or is too large for the installed SIL. If you typed a range of unit numbers, they must be in ascending order.
MODEM	`KBnn:CANNOT HAVE MODEM CONTROL` KBnn: is not on a DH11 or DZ11 interface. Therefore, it cannot have modem control.
PRIV, UNPRIV	`NOT POSSIBLE ON DISK UNIT` You cannot use PRIV or UNPRIV on a disk device.

Memory Allocation-Related Tasks

The INIT.SYS program, in addition to providing options for the tasks associated with system generation, also provides you with memory allocation suboptions for performing memory allocation-related tasks. You may need to perform these tasks during system generation, or during day-to-day system management.

During system generation, you can perform these tasks during Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

These suboptions affect the settings of your installed monitor. Thus, if you install a new monitor, you may need to use the memory allocation suboptions again to adjust the new monitor's memory allocation table.

Specifically, the tasks you might have to perform during system generation or during day-to-day system management are:

- List Memory Allocation Table (LIST)
- List the Parity Memory Configuration (PARITY)
- Reset the Memory Allocation Table (RESET)
- Lock a Portion of Memory (LOCK)
- Unlock a Portion of Memory (UNLOCK)
- Position the Primary Run-Time System (RTS)
- Allocate Memory to the Extended Buffer Pool (XBUF)
- Allocate Memory to the Small Buffer Pools (BUFFERS)

You need not perform all of these tasks, only those applicable to your installation. Unless otherwise indicated, you need not perform these tasks in the order they appear here.

Go to the task(s) that apply to your installation.

List Memory Allocation Table (LIST)

This task explains how to list the *memory allocation table*, which shows the allocation of each block of memory. You have seen this table before, during Phases 3 and 7 of system generation, where you established defaults for the SYSGEN and RSTS/E monitors. When you tailor a monitor, DEFAULT establishes the monitor defaults and automatically prints the memory allocation table.

You should perform this task during system generation if:

- You want to print the most current memory allocation table.
- You want to print the table after performing any of the other memory allocation-related tasks.

Terminal Session

To list the memory allocation table use LIST, a memory allocation suboption of the INIT.SYS program. Press RETURN after a question or prompt for an online explanation. The common memory allocation table error messages appear in Table 14, located in Task 2 of Phase 7. If you make an error and it does not appear there, see Appendix A.

```
Table suboption? LIST
```

Explanation — You see the Table suboption? prompt after you answer Installation name?, a DEFAULT question.

Response — Type LIST or LI.

```
Memory allocation table:

   0K: 00000000 - 00223777 (  37K) : EXEC
  37K: 00224000 - 00237777 (   3K) : RTS (RSX)
  40K: 00240000 - 00757777 (  84K) : USER
 124K: 00760000 - End              : NXM

Table suboption?
```

Explanation — Your table may not show the same values as the one in the example installation. You read this table as follows:

- The first column contains the start range (in K words) of memory. You read this column vertically. In the example installation, the range starts at 0K words and ends at 124K words.
- The second and third columns contain the starting and ending octal addresses for the range of memory. In the example installation, 00000000 to 00223777 are the starting and ending octal addresses for the RSTS/E monitor.
- The fourth column contains the amount of memory this range occupies in K words. In the example installation, the RSTS/E monitor occupies 37K words of memory.
- The fifth column specifies what occupies a particular range of memory:
  - EXEC – represents the RSTS/E monitor, which always starts at 0K words.
  - RTS – represents the primary run-time system; LIST prints your primary run-time system in parentheses. In the example installation, the primary run-time system is RSX.
  - USER – represents memory available for user jobs.
  - LOCKED – represents memory unavailable for use (appears if you use the LOCK suboption).
  - XBUF – represents memory reserved for the extended buffer pool (appears only if you use the XBUF suboption).
  - NXM – represents memory that does not exist on this PDP–11. If LIST shows any nonexistent memory in use, DEFAULT prints a warning message. Conversely, if LIST shows any existent memory as not in use, DEFAULT also prints a warning message.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any other tasks in this section, type EXIT or press LINE FEED to continue with Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

List the Parity Memory Configuration (PARITY)

This task explains how to identify and locate the types of parity memory. These types are parity memory and interleaved parity memory. You should perform this task if you are a DIGITAL field service representative who needs to verify the memory configuration during the installation of a PDP–11. *Parity memory* is memory that can detect certain errors.

Interleaved parity memory is memory in which alternate banks respond to sequential memory addresses, as in the following:

```
Parity Register                       Parity Register

00                                    02

BANK 0                                BANK 1

Addresses                             Addresses

000000                                000002
000004                                000006
000010                                000012
```

Note that parity register 00 responds to the first address (000000), parity register 02 responds to the next address (000002), and so forth.

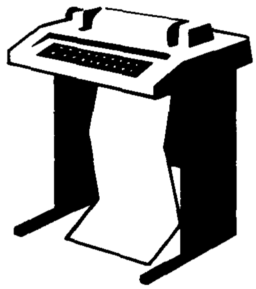
Core memory might have interleaved parity memory because it is a destructive readout device. The central processor or DMA device requests data. The RSTS/E monitor reads the requested data from a memory bank located in core memory. After the cental processor or DMA device receives the requested data, this memory bank remains busy until the RSTS/E monitor restores to it the original data. During this *restore cycle*, the RSTS/E monitor can perform other functions, including another read memory access in another bank.

If core memory has interleaved parity memory, the probability is low that the RSTS/E monitor will access the same bank of memory on the next memory cycle. This allows some overlap of memory read operations, resulting in faster program execution.

ECC MOS memory can have interleaved parity memory because on a write operation it takes time for the memory controller to determine what error-correction bits to store with the data. After the memory bank has accepted the data and the RSTS/E monitor allows the central processor or DMA device to continue, the memory bank remains busy until it has stored the data and new ECC bits. Because ECC MOS memory exhibits interleaved parity memory, the probability is low that the RSTS/E monitor will access the same bank of memory on the next memory cycle. This allows some overlap of memory write operations, thus resulting in faster program execution.

Nonparity memory is not supported by the RSTS/E monitor.

Terminal Session



To list the parity memory configuration, use PARITY, a memory allocation suboption of the INIT.SYS program. Press RETURN after a question or prompt for an online explanation. The common memory allocation table error messages appear in Table 14, located in Task 2 of Phase 7. If you make an error and it does not appear there, see Appendix A.

```
Table suboption? PARITY
```

Explanation — You see the Table suboption? prompt after you answer Installation name?, a DEFAULT question.

Response — Type PARITY or PA.

```
Parity register usage:

 0K: 00000000 - 00177777 (  32K) : 00
32K: 00200000 - 00757777 (  92K) : 10

Table suboption?
```

Explanation — In the example installation, PARITY shows the memory configuration for a PDP–11/34. Your parity memory depends on the type of PDP–11 you have. After PARITY prints the parity memory configuration, it returns to the Table suboption? prompt.

The following defines the parity type codes you might see listed. The values nn and mm are the last two octal digits of the address of the parity register that controls that section of memory. Up to sixteen parity registers can exist. They are in the address range 772100 to 772136. When the system detects a parity error, the parity register responsible for that section of memory usually contains information on the location of the last error discovered. The code NA indicates that the parity register contains no error address information.

Symbol	Meaning
NO	Nonparity memory.
NXM	Nonexistent memory.
nn mm	Interleaved parity memory with address information.
nn	Parity memory with address information.
nn(NA)	Parity memory with no address information.
nn(ECC)	Memory with ECC hardware.
nn(ECC) mm(ECC)	Interleaved memory with ECC hardware.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any other tasks in this section, type EXIT or press LINE FEED to continue with Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

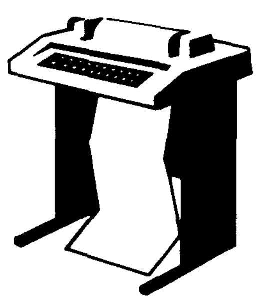
Reset Memory Allocation Table (RESET)

This task explains how to remove any changes made to the memory allocation table, for example, locked portions of memory, reserved memory for the extended buffer pool, and nonstandard placement of the run-time system.

You should perform this task only if you want to set up the memory allocation table according to the following:

- Place the primary run-time system in low memory, immediately after the monitor.
- Release any memory you previously allocated to the extended buffer pool.
- Release to user memory any memory you previosly locked.
- Find any new memory and allocate it to user memory.

Terminal Session



To reset the memory allocation table use RESET, a memory allocation suboption of the INIT.SYS program.

```
Table suboption? LIST
```

Explanation — You see the Table suboption? prompt after you answer the Installation name? question asked by DEFAULT.

Response — Before you reset the memory allocation table it is useful to list the current one. Type LIST or LI.

```
Memory allocation table:

  0K: 00000000 - 00223777 (  37K) : EXEC
 37K: 00224000 - 00237777 (   3K) : RTS (RSX)
 40K: 00240000 - 00333777 (  15K) : XBUF
 55K: 00334000 - 00757777 (  69K) : USER
124K: 00760000 - End              : NXM

Table suboption? RESET
```

Explanation — LIST shows that in the example installation there are 15K words of memory reserved for the extended buffer pool. (Assume that the example installation already performed the Allocate Memory to the Extended Buffer Pool Task, which is explained in this section.)

Response — Type RESET or RE.

```
Table suboption? LIST
```

Explanation — The suboption immediately resets the memory allocation table and returns to the Table suboption? prompt.

Response — It is useful to list the current memory allocation table after you use the RESET suboption, thus, type LIST, as in the example installation.

```
Memory allocation table:

  0K: 00000000 - 00223777 (  37K) : EXEC
 37K: 00224000 - 00237777 (   3K) : RTS (RSX)
 40K: 00240000 - 00757777 (  84K) : USER
124K: 00760000 - End              : NXM

Table suboption?
```

Explanation — Note that RESET released to the user area of memory the memory previously reserved for the extended buffer pool.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any other tasks in this section, type exit or press LINE FEED to continue with Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

Lock a Portion of Memory (LOCK)

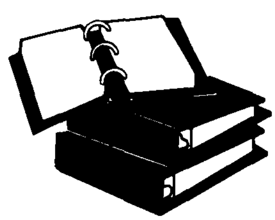
This task explains how to lock certain portions of memory, which prevents the use of that memory during timesharing. Normally, you perform this task during day-to-day system management, not during system generation.

You should perform this task only if:

- You need to lock a portion of defective memory. If sufficient undamaged memory remains, you can start the monitor for normal timesharing.
- You want to start the RSTS/E monitor with less memory than is physically available. This could be useful for developing applications that can run on a smaller memory configuration.

To lock a portion of memory, use LOCK, a memory allocation suboption of the INIT.SYS program. This task is divided into two parts: a preparation session and a terminal session. The preparation session provides background information on when and how to use LOCK. The terminal session provides an example.

Preparation Session



Certain types of memory failures affect only one word of memory; other types affect larger sections or even the entire hardware bank. You must carefully analyze any memory failure to determine the 1K section of memory to lock. Additionally, after you lock memory, list the memory allocation table to ensure that sufficient contiguous user memory is available to run your installation's programs.

Before you lock a portion of memory, you should be aware of the following restrictions:

- You cannot lock memory used by the monitor.
- You cannot lock memory currently allocated to the primary run-time system until you relocate it to a usable area of memory (memory that is unlocked and available for use). You relocate the primary run-time system by using the RTS memory allocation table suboption.
- You cannot lock memory currently reserved for the extended buffer pool (XBUF) until you relocate it to a usable area of memory.
- You cannot lock a full bank of memory, until you locate all of the 4, 8, 16, 32, 64, or 128 contiguous 1K sections that make up the hardware bank. If the bad memory is interleaved, you must lock an amount of memory equal to twice its length.

If you attempt to lock any of these areas of memory, LOCK prints the message: Part of that area is already in use.

RSTS/E can continue running with certain types of memory failures. The error handling routines in the monitor log parity errors when they are detected by the hardware. The recovery procedures depend on the use of the section of memory that failed. Consider the following four cases of memory failure and recovery procedures.

In the first case, a parity error occurs when the monitor is running. Since continued system operation would be risky, the monitor logs the error, takes a crash dump (if the crash dump facility is enabled), and reloads the system. When the system restarts, you should use the ANALYS program to extract the error log information from the CRASH.SYS file. The ERRDIS report, which the monitor automatically appends to the ANALYS report, provides sufficient information to identify the section that should be locked out. If the error occurred in the primary run-time system or extended buffer area of memory, you can relocate these items and lock the section. If the error was in monitor memory, the hardware must be repaired or reconfigured. In either case, a hard failure may prevent the system from running at all; thus, you can run neither ANALYS nor ERRDIS. The only recourse in such cases is to run memory diagnostics to locate the problem. If the failure was transient, you can shut down the system to lock out memory or you can continue timesharing. If possible, memory diagnostics should be run to reproduce the failure.

In the second case, a parity error occurs when a user job is running. The parity error handling routines determine whether a single user job is affected (that is, resides in the malfunctioning section) or more than one user job is affected. If more than one user job is affected, the system is reloaded as described previously. If a single user job is affected, the system aborts that user job with the error message ?MEMORY PARITY FAILURE. The monitor logs the error, automatically locks out the section of memory from future use (for the duration of the timesharing session), and the system continues running. You should lock out the bad section of memory (until repaired), using the LOCK suboption the next time you start the system.

In the third case, multiple parity errors occur in rapid succession. RSTS/E halts at location 54 (56 is displayed) if a second parity error occurs while the system is processing the first parity error. Field service will use memory diagnostics to locate the failing memory.

The fourth case concerns a memory cache parity error. If the hardware memory cache malfunctions and causes a parity error, the hardware again retrieves the needed word from main memory and causes a warning parity trap to occur. RSTS/E logs this type of error. If the error occurs twice within one minute, RSTS/E disables the part of the cache causing the malfunction. RSTS/E continues running, but with degraded performance. The system does not print a message, but two successive errors within the same minute in the ERRDIS print-out should alert you.

On systems without parity or ECC memory, the software cannot detect or locate a memory failure. Programs may get incorrect results, memory management errors may occur, or any number of random problems may happen. At worst, the system may crash with misleading clues as to the cause.

Terminal Session

To lock a portion of memory, use LOCK, a memory allocation table suboption of INIT.SYS. Press RETURN after a question or prompt to obtain an online explanation. The common memory allocaton table error messages appear in Table 14, located in Task 2 of Phase 7. If you make an error and it does not appear there, see Appendix A.

```
Table suboption? LOCK
```

Explanation — You see the Table suboption? prompt after you answer the Installation name? question asked by DEFAULT.

Response — Type LOCK or LO.

```
Lock address is? 57K
```

Explanation — LOCK asks you to specify the address or range of addresses you want to lock.

Response — Type the absolute address as a four- to eight-digit octal address. The octal number must be a multiple of 4000 (8) that is less than or equal to 16774000.

Or, type the address as a decimal number followed by the letter K. The decimal number must be in the range from 0 to 1919.

Or, specify a range of addresses by typing either two addresses separated by a hyphen (for example, 45K–47K) or an address followed by a plus sign and a number that represents the size of the range (for example, 45K+3.)

In the example installation, the response is 57K.

```
Table suboption? LIST
```

Explanation — After you specify an address, LOCK returns to the Table suboption? prompt.

Response — Type LIST or LI to list the memory allocation table and check that you have locked the correct area of memory.

```
Memory allocation table:

  0K: 00000000 - 00233777 (  39K) : EXEC
 39K: 00234000 - 00247777 (   3K) : RTS (RSX)
 42K: 00250000 - 00343777 (  15K) : XBUF
 57K: 00344000 - 00347777 (   1K) : LOCK
 58K: 00350000 - 00757777 (  66K) : USER
124K: 00760000 - End              : NXM

Table suboption?
```

Explanation — The memory allocation table shows that 1K of memory is now locked.

☞ Go to any other task in this section, according to the needs of your installation.

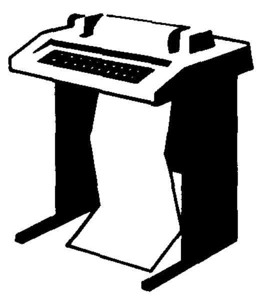
☞ If you do not need to perform any other tasks in this section, type EXIT or press LINE FEED to continue with Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

Unlock a Portion of Memory (UNLOCK)

This task explains how to unlock certain portions of memory to make the memory available for use during timesharing by user jobs, the primary run-time system, or the extended buffer pool (XBUF). Normally, you perform this task during day-to-day system management rather than during system generation.

You should perform this task if you need to unlock a portion of memory you previously locked with the LOCK suboption. To unlock a portion of memory use UNLOCK, a memory allocation suboption of the INIT.SYS program.

Terminal Session



This terminal session explains how to unlock a portion of memory. Press RETURN after a question or prompt to obtain an online explanation. The common error messages appear in Table 14, located in Task 2 of Phase 7. If you make an error and it does not appear there, see Appendix A.

```
Table suboption? UNLOCK
```

Explanation — You see the Table suboption? prompt after you answer the Installation name? question asked by DEFAULT.

Response — Type UNLOCK or UN.

```
Unlock address is? 57K
```

Explanation — UNLOCK asks you to specify the address or range of addresses you want to unlock.

Response — Type the absolute address as a four- to eight-digit octal address. The octal number must be a multiple of 4000 (8) that is less than or equal to 16774000.

Or, type the address as a decimal number followed by the letter K. The decimal number must be in the range from 0 to 1919.

Or, specify a range of addresses by typing either two addresses separated by a hyphen (for example, 45K–47K) or an address followed by a plus sign and a number that represents the size of the range (for example, 45K+3.)

In the example installation, the response is 57K.

```
Table suboption? LIST
```

Explanation — After you specify an address, UNLOCK returns to the Table sub-option? prompt.

Response — Type LIST or LI to list the memory allocation table and check that you have unlocked the correct area of memory.

```
Memory allocation table:

   0K: 00000000 - 00233777 (  39K) : EXEC
  39K: 00234000 - 00247777 (   3K) : RTS (RSX)
  42K: 00250000 - 00343777 (  15K) : XBUF
  57K: 00344000 - 00757777 (  67K) : USER
 124K: 00760000 - End              : NXM

Table suboption?
```

Explanation — Note that UNLOCK removes the 1K area of memory that was locked in the previous task.

☞ Go to any other task in this section, according to the needs of your installation.

☞ If you do not need to perform any other tasks in this section, type EXIT or press LINE FEED to continue with Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

Position the Primary Run-Time System (RTS)

This task explains how to position the primary run-time system (BASIC–PLUS or RSX) anywhere in the first 124K of memory. Normally, DEFAULT automatically positions the primary run-time system immediately after the RSTS/E monitor, in the lowest physical memory addresses.

You should perform this task if:

- You need to position the primary run-time system to avoid defective memory.
- You want to position the BASIC–PLUS primary run-time system in high-speed memory, if your system has different types of memory.

Terminal Session

To position the primary run-time system use RTS, a memory allocation suboption of INIT.SYS. This terminal session explains how to use RTS. Press RETURN after a question or prompt to obtain an online explanation. The common error messages appear in Table 14, located in Task 2 of Phase 7. If you make an error and it does not appear there, see Appendix A.

```
Table suboption? LIST
```

Explanation — You see the Table suboption? prompt after you answer the Installation name? question asked by DEFAULT.

Response — Before you position the primary run-time system, it is useful to list the memory allocation table. Type LIST, as in the example installation.

```
Memory allocation table:

   0K: 00000000 - 00233777 (  39K) : EXEC
  39K: 00234000 - 00247777 (   3K) : RTS (RSX)
  42K: 00250000 - 00757777 (  82K) : USER
  124K:00760000 - End              : NXM

Table suboption? RTS
```

Response — Type RTS, as in the example installation.

```
New Run Time System address is? 121K

Table suboption? LIST
```

Explanation — RTS asks you to specify the address where you want to position the primary run-time system.

Response — Type the address as a decimal number followed by the letter K. The decimal number must be in the range from 0 to 1919.

Or, specify a range of addresses by typing either two addresses separated by a hyphen (for example, 45K–47K) or an address followed by a plus sign and a number that represents the size of the range (for example, 45K+3).

There must be enough free contiguous space for the primary run-time system between the starting address you specify and 124K. In the example installation, the response is 121K.

After you specify the address, RTS returns to the Table suboption? prompt. Type LIST to list the memory configuration table again to see that the monitor positioned the primary runtime system correctly.

```
Memory allocation table:

   0K: 00000000 - 00233777 (  39K) : EXEC
  39K: 00234000 - 00743777 (  82K) : USER
 121K: 00744000 - 00757777 (   3K) : RTS (RSX)
 124K: 00760000 - End              : NXM


Table suboption?
```

Explanation — Note where the primary run-time system now resides.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any other tasks in this section, type EXIT or press LINE FEED to continue with Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

Allocate Memory to the Extended Buffer Pool (XBUF)

This task explains how to reserve memory for the extended buffer pool. This task has two parts: a preparation session and a terminal session. The preparation session provides background information to help you determine how much memory to reserve for the extended buffer pool. The terminal session explains how to use XBUF (an INIT.SYS memory allocation table suboption) to reserve this memory.

Preparation Session

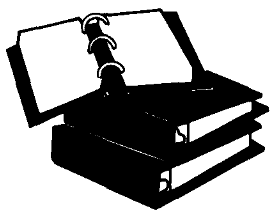


Figure 9 shows that memory is divided into:

- Monitor memory (EXEC) – an area of memory reserved for your RSTS/E monitor. Monitor memory in the example installation occupies 37K words. The size of your monitor memory may differ.
- Run-time system memory (RTS) – an area of memory reserved for your primary run-time system. In the example installation, the primary run-time system is RSX and occupies 3K words. The size of your run-time system memory will be larger if your primary run-time system is BASIC–PLUS.
- Extended buffer pool (XBUF) – an area of user memory reserved for *extended buffers*. An extended buffer is a block of storage located in the extended buffer pool that can range in size from 32 words to the maximum size of the extended buffer pool. In the example installation, the size of the extended buffer pool is 15K words (see Figure 9). The extended buffer pool occupies user memory; thus, releasing 15K words from the extended buffer pool would increase user memory to 84K words.
- User memory (USER) – an area of memory reserved for user jobs. In the example installation, user memory occupies 69K words. The size of your user memory may differ.

When the monitor needs an extended buffer to store information, it looks in the extended buffer pool. When the information stored in the extended buffer is no longer needed, the monitor returns the extended buffer to the extended buffer pool for reuse.

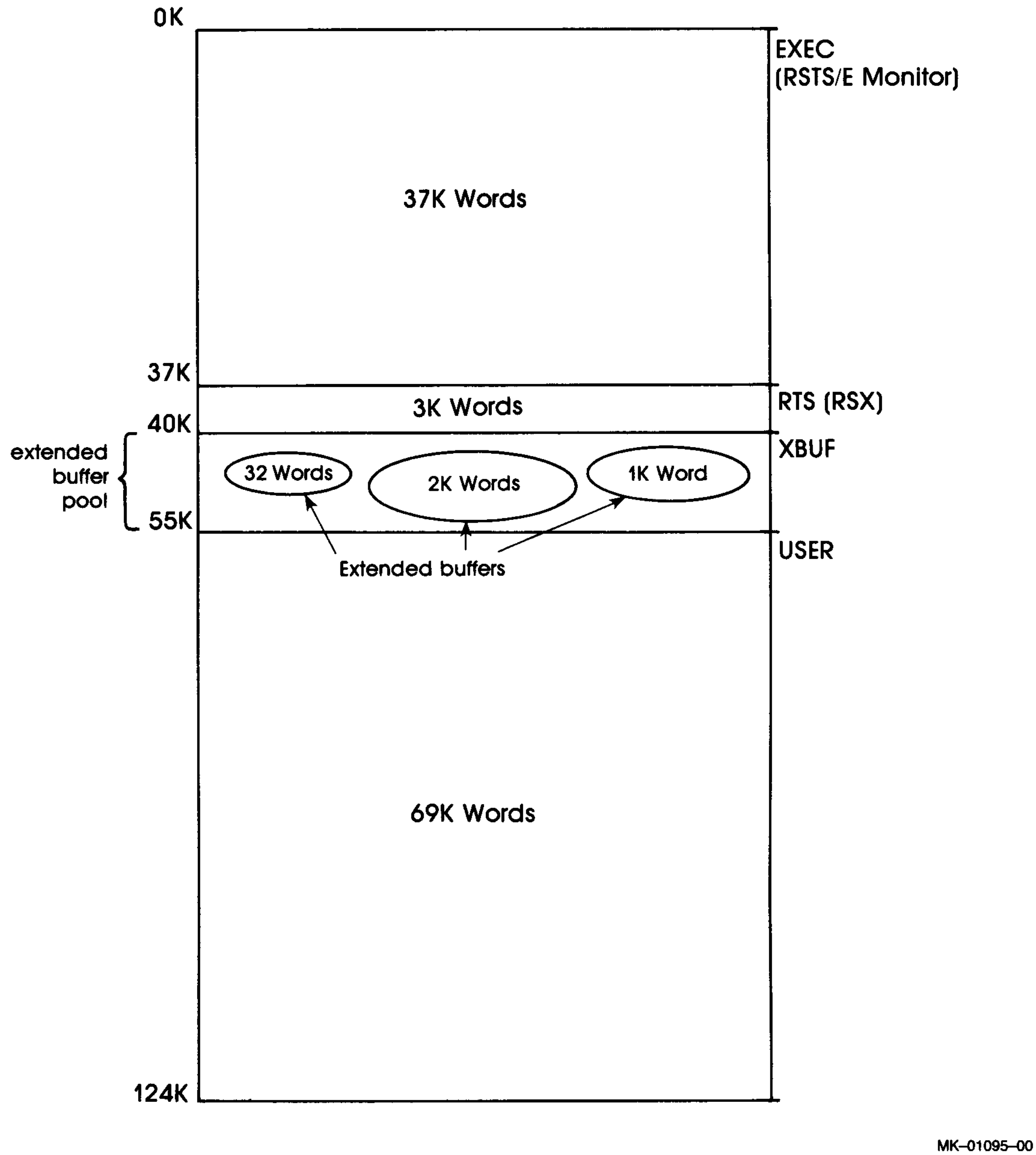


Figure 9: Extended Buffer Pool for Example Installation

The size of the extended buffer pool depends on the type of processing and the amount of memory on your system. Allocating enough memory to the extended buffer pool increases the number of available extended buffers, which has the following advantages:

- The monitor can perform data and/or directory caching (if you selected these features) more frequently. This means the monitor stores certain data and directory-related information in the extended buffers. This reduces the number of times disk input/output occurs, which results in improved system response.
- The monitor can perform line printer caching (if you selected this feature) more frequently. This means the monitor stores line printer output in the extended buffers. This reduces the stalling frequency of the line printer when printing data.
- The monitor can store some kinds of information in either extended buffers or in general small buffers (explained in the next task). Because the number of general small buffers is limited, the monitor uses extended buffers whenever they are available to reduce the demand for general small buffers.

This preparation session discusses guidelines for determining the amount of user memory you should reserve for the extended buffer pool with respect to:

- Message send/receive code
- Line printers
- Data caching
- Directory caching
- DECnet/E software
- RJ2780 software
- 2780/3780 software

Message Send/Receive Code

The RSTS/E monitor uses extended buffers to store messages generated by programs that use the message send/receive code. You might want to use the following as a guide in determining how many messages are generated for a typical system:

- Error logger – 2 messages
- OPSER – 2 messages
- QUEMAN – 2 messages
- 1 line printer spooler – 2 messages
- 1 batch spooler – 2 messages

The example installation plans for 10 messages (as listed in the above guideline). Each message requires N words of extended buffers

where:

N is the length of the message in words plus 4 words, rounded to the next multiple of 32 words. A message always uses at least 32 words of extended buffers. Each message can range from 32 to 288 words.

The example installation estimates that each message will use 28 words of extended buffers. The example installation also estimates that the average number of messages sent and waiting to be received at any one time is 10. Therefore, the example installation needs 280 words (10 messages * 28 words) to accommodate 10 messages at 28 words each.

Line Printers

The RSTS/E monitor uses extended buffers (or general small buffers) to store characters awaiting printing on a line printer. (You must have answered Y to the Extended data buffering for LP? question in Phase 4.) You should allow 2.5K words of memory for the extended buffer pool for each line printer. The example installation plans to reserve 3K words (2.5K words for one line printer, and another .5K words to accommodate messages that use the message send/receive code, which was figured previously).

Data Caching

The monitor uses extended buffers to store the activities resulting from data caching. Data caching is a software feature that reduces the number of data transfers from disk to memory, thereby improving response times. (You have data caching only if you answered Y to the Data Caching? question in Phase 4.)

A general guideline is to allocate about 5% of total memory to the extended buffer pool to accommodate data caching. (If you choose data caching, you must also choose directory caching. The general guideline is to allocate 10% of total memory for directory caching. Thus, if you support both data and directory caching you should allocate 15% of total memory to the extended buffer pool.) However, do not exceed 100K words for this purpose. Because the example installation did not select data caching, no memory is reserved for the extended buffer pool for this purpose.

Note

The monitor uses extended buffers (or general small buffers) for data and directory caching only when they are not needed for other purposes.

Directory Caching

The monitor uses extended buffers to store the activities resulting from directory caching, a software feature that accelerates file processing. (You have directory caching only if you answered Y to the Directory Caching? question in Phase 4.) If you also selected data caching, then you must also select directory caching and reserve memory in the extended buffer pool for this purpose. Directory caching uses extended buffers that are 256 words in size, and at most can occupy 175K words of memory in the extended buffer pool.

If you allocate more than 8K words to the extended buffer pool, the monitor will not use general small buffers for directory caching, thereby reducing CPU overhead. A general guideline is to allocate about 10% of memory to the extended buffer pool to accommodate directory caching. However, do not exceed 100K words for this purpose.

In the example installation, directory caching (and not data caching) was chosen. Therefore, the example installation plans to allocate 12K words (10% * 124K words) to the extended buffer pool to accommodate directory caching.

DECnet/E Software

The monitor uses extended buffers to store messages generated by DECnet/E software. (If you do not reserve memory for the extended buffer pool, or if the extended buffer pool is filled, the RSTS/E monitor uses general small buffers to store these messages.) See the *DECnet/E Installation Guide* for information on how much memory to reserve for the extended buffer pool. Because the example installation is not using DECnet/E, no memory is reserved in the extended buffer pool for DECnet/E.

RJ2780 Software

The monitor uses extended buffers to store messages generated by the RJ2780 software. This software requires 1K–word of memory for the extended buffer pool. See the RJ2780 documentation. Because the example installation is not using RJ2780, no memory is reserved for RJ2780 in the extended buffer pool.

2780/3780 Software

See the 2780/3780 documentation for extended buffer pool considerations. Because the example installation is not using 2780/3780 software, no memory is reserved in the extended buffer pool for this item.

Note

You must be able to fit at least two jobs at SWAP MAX (or the average job size, if known) in memory. If you cannot do this, then you may have to reduce the amount of memory you allocated to the extended buffer pool. In the example installation, two jobs at SWAP MAX requires 64K words (2 jobs * 32K). Because the USER area of memory is 69K words, no adjustment need be made.

Extended Buffer Pool Requirements for Example Installation

The following summarizes the amount of memory reserved for the extended buffer pool in the example installation:

- Message send / receive code – .5K word
- Directory caching – 12K words
- Line printer driver – 2.5K words

Thus, the example installation will reserve 15K words for the extended buffer pool.

Figure 10 summarizes the items requiring extended buffers, and the approximate amounts of memory each requires. Space is provided to enter the size needed for your installation. Use this worksheet as a guide to reserving memory for the extended buffer pool. Remember, you can determine the optimal size only through experimentation.

Items Requiring Extended Buffers	Approximate Size (in words)	Your Size
*Contents of messages sent and waiting to be received.	N words of extended buffer space, where N = length of each message rounded to next multiple of 32 words. Ranges from 32 to 288 words for each message.	______
*Line Printer Driver	2.5K words per line printer.	______
Data Caching	5% of total memory to accommodate data caching. Do not exceed 100K words. (If you choose data caching, you must also choose directory caching.)	______
*Directory Caching	10% of total memory to accommodate directory caching. Do not exceed 100K words.	______
DECnet/E	See *DECnet/E Installation Guide.*	______
RJ2780	Minimum 1K word.	______
2780/3780 Software	See 2780/3780 documentation.	______
**Total		______

* The RSTS/E monitor can also use general small buffers to store these items.

** Reduce the extended buffer pool if two jobs at SWAP MAX will not fit in the USER area of memory.

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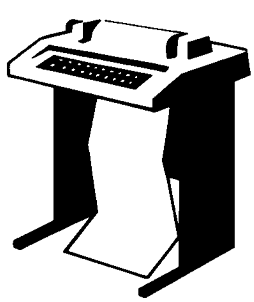
Figure 10: Extended Buffer Pool Worksheet

Terminal Session



To reserve memory for the extended buffer pool, use XBUF, a memory allocation table suboption. Press RETURN after a question or prompt to obtain an online explanation. The common memory allocation table error messages appear in Table 14, located in Task 2 of Phase 7. If you make an error and it does not appear there, see Appendix A.

```
Table suboption? XBUF
```

Explanation — You see the Table suboption? prompt after you answer the Installation name? question asked by DEFAULT in Phase 7.

Response — Type XBUF, as in the example installation.

```
Extended buffer address range is? 40K+15
```

Explanation — XBUF asks for the address or range of addresses you want to reserve for the extended buffer pool. Like the monitor and the primary run-time system, the extended buffer pool must reside within the first 512K words (00100000 (16K) to 03777700 (511K)) of memory. The memory allocation table designates the extended buffer pool as XBUF. You can reserve only a contiguous range of addresses for the extended buffer pool.

Study the memory allocation table printed by DEFAULT before answering this question. Also refer to the Extended Buffer Pool Worksheet for the size of your extended buffer pool.

Response — You can enter the addresses in one of two ways:

- Specify a range of addresses by typing two addresses separated by a hyphen (for example, 44K–59K).
- Specify an address followed by a plus sign (+) and a number that represents the size of the range (for example, 44K+15).

To release previously allocated memory for the extended buffer pool to user memory, type RESET.

Because the example installation needs to reserve 15K words for the extended buffer pool, the response is 40K+15.

```
Table suboption? LIST
```

Explanation — After you respond, XBUF returns to the Table suboption? prompt.

Response — Type LIST or LI to list the memory allocation table and check that you have reserved the correct area in memory.

```
Memory allocation table:

   0K: 00000000 - 00223777 (  37K) : EXEC
  37K: 00224000 - 00237777 (   3K) : RTS (RSX)
  40K: 00240000 - 00333777 (  15K) : XBUF
  55K: 00334000 - 00757777 (  69K) : USER
 124K: 00760000 - End              : NXM

Table suboption?
```

Explanation — The memory allocation table shows the size and location of the memory you have reserved for the extended buffer pool.

Note

During start-up, INIT.SYS uses an 8K word area of memory to complete the loading of the monitor. This 8K word area is allocated from either RTS or USER (see the memory allocation table). If INIT.SYS cannot find an 8K word area of memory, it prints the error message: Need at least 8KW nonmonitor memory below 124K to start.

If your primary run-time system is 8K words or larger (BASIC–PLUS), there is no problem. If your primary run-time system is smaller than 8K words, as in the example installation, then the monitor uses any combination of RTS and USER memory, if the RTS memory is adjacent to user memory. Otherwise, the monitor uses USER memory.

☞ Go to any other task in this section, according to the needs of your installation.

☞ If you do not need to perform any other tasks in this section, type EXIT or press LINE FEED to continue with Task 2 (Establish RSTS/E Monitor Defaults) in Phase 7.

Allocate Memory to the Small Buffer Pools (BUFFERS)

This task explains how to reserve more memory for the small buffer pools. You should perform this task to determine if your RSTS/E monitor needs more small buffers to run efficiently.

This task has two parts: a preparation session and a terminal session. The preparation session provides background information to help you determine how much memory to reserve for the small buffer pools. The terminal session explains how to use BUFFERS (an INIT.SYS memory allocation table suboption) to allocate this memory.

Preparation Session

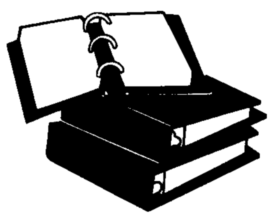


Figure 11 shows that memory is divided into:

- Monitor memory (EXEC) – an area of memory reserved for the RSTS/E monitor. Monitor memory in the example installation occupies 37K words. Note that the size of the monitor increases to 39K words after the example installation allocates 2K words for the FIP small buffer pool. The size of your monitor may differ.
- Run-time system memory – an area of memory reserved for your primary run-time system. In the example installation, the primary run-time system is RSX and occupies 3K words. Note that the size of your run-time system memory will be larger if your primary run-time system is BASIC–PLUS.
- User memory (USER) – an area of memory reserved for user jobs. In the example installation, user memory occupies 69K words. Note that the size of USER memory decreases to 67K words after the example installation allocates 2K words for the FIP small buffer pool. The size of your user memory may differ.
- Extended buffer pool (XBUF) – an area of memory reserved for the extended buffer pool. (See the previous task for a discussion of the extended buffer pool.)

Figure 11 also shows that monitor memory contains the:

- *General small buffer pool* – an area of monitor memory that contains *general small buffers*. Note that there are two types of general small buffer pools: one that is created as a result of answering the Small buffers? configuration question in Phase 4, and one that is created using the BUFFERS suboption. You can create this second small buffer pool only if you have a hardware feature on your CPU called *data space*. Data space is available only on a PDP–11/44, 11/45, 11/50, 11/55, or 11/70 and only if you do not use RJ2780 software.

  Because the example installation's CPU is a PDP–11/34, data space is not available; therefore, the only way to increase the number of small buffers is to do another system generation and respond to the Small buffers? question with a larger number.

- *FIP small buffer pool* – an area of monitor memory that contains *FIP small buffers*. There are also two types of FIP small buffer pools: one that you can create with the BUFFERS suboption alone, and the other you can create with the BUFFERS suboption and with data space. Figure 11 illustrates these two FIP small buffer pools.

The RSTS/E monitor uses general small buffers as a temporary storage area for such things as:

- The input and output of characters
- Data transfers
- Send/receive messages
- File processing requests
- Information on open files
- CCL command definitions

In contrast to general small buffers, FIP small buffers are used only to store open files information and CCL command definitions. When the monitor needs a small buffer to store open files or CCL command definitions information, it looks in the FIP small buffer pool for a FIP small buffer. This leaves the supply of general small buffers free to store other kinds of activity that the FIP small buffers cannot handle. If there are no free FIP small buffers, the monitor uses general small buffers to store the open files information and CCL command definitions. When the information stored by either small buffer is no longer needed, the monitor returns the small buffer to the appropriate small buffer pool for reuse.

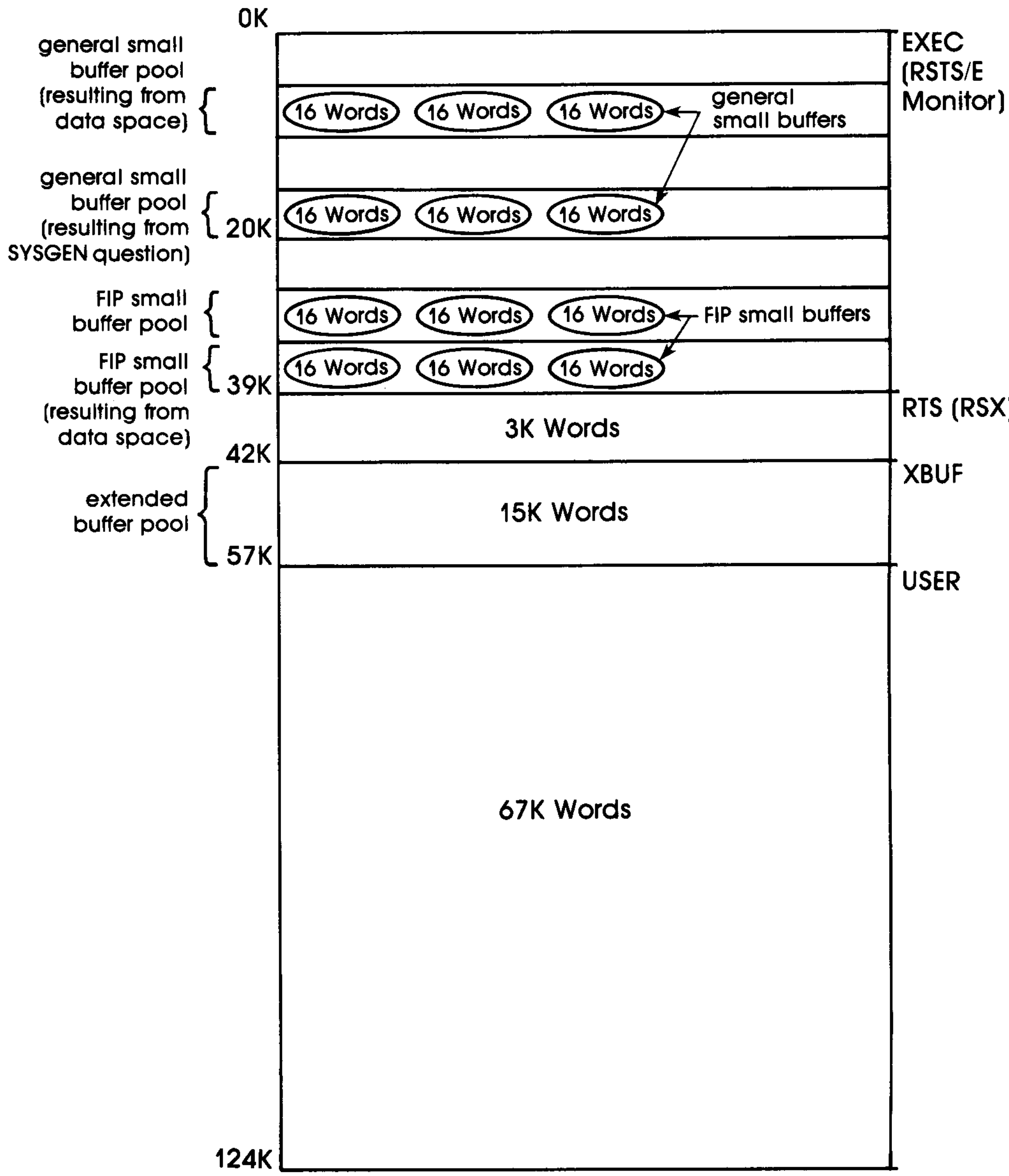


Figure 11: General and FIP Small Buffer Pools

The general small buffer supply is critical to your system's performance. The number of free general small buffers varies from second to second. When this number is less than 75, the following occurs:

- Jobs begin to stall, until some small buffers become available to process the jobs' requests. Thus, performance suffers seriously.
- The monitor discards error information destined for the error logger.

- The ?No logins error message appears when users try to log in. (This usually happens when the number of general small buffers falls below 40.)
- Batch jobs do not start. (This usually happens when the number of general small buffers falls below 40.)
- Programs begin to fail with the message ?No buffer space available.

The number of general small buffers should stay well above 75 for good system performance. Because FIP small buffers reduce the demand on general small buffers, the number of FIP small buffers may drop to zero without any loss to system performance.

The /F (free) switch of the SYSTAT program displays the number of available general small buffers and FIP small buffers as well as other system statistics. The VT50PY (for VT100 and VT52 terminals) display programs give the same display as the SYSTAT program. The *RSTS/E System User's Guide* describes SYSTAT; the *RSTS/E System Manager's Guide* describes the VT50PY display program.

The rest of this preparation session discusses guidelines for determining how many small buffers you need with respect to:

- Jobs
- CCL command definitions
- Auxiliary run-time systems
- Resident libraries
- Open files
- Message receivers
- List of messages sent and waiting to be received
- Contents of messages sent and waiting to be received
- Terminals
- Line printers
- Paper tape punches
- EMT logger

Jobs

The monitor uses general small buffers to store information about each job. Allow three general small buffers per job. In the example installation, the number of general small buffers for the maximum number of jobs is 81 (3 general small buffers * 27 jobs).

CCL Command Definitions

The monitor uses general or FIP small buffers to store CCL command definitions. Allow one general or FIP small buffer for each defined CCL command. See the *RSTS/E System Manager's Guide* for a description of CCL command definitions and the UTILTY program, which you use to define CCL commands. In the example installation, the estimated number of general or FIP small buffers for CCL commands is 41 (for the sample CCL.CMD command file).

Auxiliary Run-Time Systems

The monitor uses general small buffers to store information about auxiliary run-time systems that you add with the UTILTY program. Allow one general small buffer for each auxiliary run-time system. In the example installation, the number of general small buffers for the auxiliary run-time systems is three (for BASIC–PLUS, RT11, and DCL).

Resident Libraries

The monitor uses general small buffers to store resident libraries. Allow one general small buffer for each resident library. In the example installation, the number of general small buffers for resident libraries is seven (for seven RMS resident libraries).

Open Files

The monitor uses general or FIP small buffers to store descriptions of open files. The monitor uses FIP small buffers first, if they are available. A program can open a file on more than one I/O channel, and more than one program can open the same file at the same time. For each program allow:

- One general or FIP small buffer for each open file.
- One general or FIP small buffer for each channel on which the file is open; however, you need two general or FIP small buffers for each channel on which the file is open if you use *update mode*. See the *RSTS/E Programming Manual* for a discussion of update mode.

In the example installation, the number of general or FIP small buffers is 135 (2 open files * 27 jobs and 3 open channels * 27 jobs).

List of Message Receivers

The monitor uses general small buffers to store a list of message receivers. Many system programs (including QUEMAN, ERRCPY, BATCH, SPOOL, and OPSER) receive messages through the send/receive system function calls. These system function calls need one general small buffer for each message receiver. In the example installation, the number of general small buffers for message receivers is five (four for the standard RSTS/E spooling package and one for the error logger).

Messages Sent and Waiting To Be Received

You need one general small buffer for each message sent and two general small buffers for each receiving job. In the example installation, the number of general small buffers for this item is 10.

Contents of Messages Sent and Waiting To Be Received

The monitor stores the contents of messages sent in general small buffers if it cannot use extended buffers. If you did not include this item when you reserved memory for the extended buffer pool, you should include it in your general small buffers calculation. The number of messages that the monitor can store in the general small buffer pool depends on the size of the messages and the speed with which the receiving job processes them.

You need N general small buffers for each message

where:

$$N = \frac{(\text{length of message in bytes} + 8)}{32}$$

For example, you might figure that the average message contains 25 to 56 bytes, which will occupy two general small buffers. If your system processes many messages, you can improve system performance by allocating memory to the extended buffer pool for these messages. In the example installation, no general small buffers are reserved for this item, because memory was reserved in the extended buffer pool.

Terminals

The monitor uses general small buffers to store:

- Characters written by a job and awaiting display on a terminal.
- Characters typed by a user and waiting to be read by a job.
- Characters written by a job and awaiting printing on a hard-copy terminal. You should allow:
  - Five general small buffers for each interactive terminal, several more if echo control and FMS are used
  - Ten general small buffers for each hard-copy terminal

In the example installation, the response is 70 (5 * 14 terminals).

Line Printers

The RSTS/E monitor uses general small buffers (or the extended buffer pool) to store characters awaiting printing on a line printer. (You must have answered Y to the Extended data buffering for LP? question in Phase 4.) If you reserved memory in the extended buffer pool for line printers, you need not specify any small buffers, as in the example installation. If you need general small buffers for this purpose, specify 20 for each line printer.

Paper Tape Reader/Punch

The monitor uses general small buffers to store characters awaiting punching on a paper tape reader/punch. Allow for 10 general small buffers for each paper tape punch. In the example installation, no general small buffers need be figured because there are no paper tape readers/punches.

EMT Logging

The monitor uses general small buffers to store messages generated by EMT logging. (You are concerned with this only if you answered Y to the EMT logging? question in Phase 4.) You should specify 1 general small buffer if you have EMT logging. In the example installation, there is no response because EMT logging was not selected.

Margin of Safety

After you finish calculating how many small buffers you will need, you should add 80 general small buffers to assure that the number of general small buffers remains above 75.

To summarize the example installation's general and FIP small buffer requirements:

Item	General	General or FIP
Jobs	81	
CCL Commands		4
Run-time systems	3	
Resident libraries	7	
Open files		54
Open channels		81
Send/ receive	15	
Terminals	70	
Margin of safety	80	
Total	256	176

The summary shows that the example installation needs 432 small buffers, but 176 of these could be either FIP or general small buffers; therefore, the example installation should have enough small buffers.

Figure 12 summarizes the items requiring general and/or FIP small buffers and the approximate number each requires. Space is provided to enter the number you need for your installation. Use the worksheet as a guide for calculating the number of general and FIP small buffers. You can determine the optimal number only through experimenting with your system.

Items Requiring General or FIP Small Buffers	Approximate Number	Number for Your Installation
Jobs	3 general small buffers per job.	______
CCL commands	1 general or FIP small buffer per CCL command.	______
Auxiliary run-time systems	1 general small buffer per run-time system.	______
Resident libraries	1 general small buffer per library.	______
Open files	1 general or FIP small buffer per open file; plus 1 general or FIP small buffer per channel on which the file is open; 2 general or FIP small buffers per channel if update mode is used.	______
List of message receivers	1 general small buffer per message receiver.	______
List of messages sent by one job waiting to be received by another job	1 general small buffer per message sent; 2 general small buffers per receiving job.	______
*Contents of messages sent and waiting to be received	N general small buffers for each message, N = (length of message in bytes + 8)/32.	______
Terminals	5 general small buffers per terminal (several more if echo control or FMS is used); 10 general small buffers per hard-copy terminal.	______
*Line printers	20 general small buffers per line printer if you did not reserve memory in the extended buffer pool for this item.	______
Paper tape reader/punch	10 general small buffers per paper tape punch.	______
EMT logging	1 general small buffer.	______
Margin of safety	80 general small buffers.	______
Total		______

* The RSTS/E monitor can also use extended buffers to store these items.

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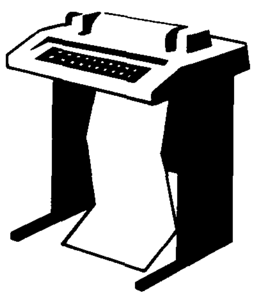
Figure 12: General and FIP Small Buffer Pool Worksheet

Terminal Session



You can increase the memory reserved for the small buffer pool during Phase 7 of system generation or during day-to-day system management.

The terminal session shows you how to increase or decrease this memory with the use of BUFFERS. You access BUFFERS by first specifying the DEFAULT option of INIT.SYS. Consider the following when deciding when to increase the memory reserved for the small buffer pool:

- You should provide an adequate supply of small buffers for periods of heavy system use. Thus, you should assume that the system is using the maximum number of jobs, all terminals, and all printers.
- The number of small buffers a program uses depends on what it is doing. For example, a program that opens twelve files at once requires more buffers than other programs. This manual offers guidelines, but you must follow and adjust these guidelines according to the needs of your installation.
- Some software features use buffers momentarily, but it is difficult to calculate how many small buffers you will need for momentary use. Thus, DIGITAL recommends that you add 80 small buffers to your final figure. Seventy-five of these 80 go towards keeping the number above 75 most of the time.

Press RETURN after a question or prompt to obtain an online explanation. The common memory allocation table error messages appear in Table 14, located in Task 2 of Phase 7. If you make an error and it does not appear there, see Appendix A.

```
Table suboption? BUFFERS
```

Explanation — You see the Table suboption? prompt after you answer the Installation name? question asked by DEFAULT.

Response — Type BUFFERS or BU.

```
How many K-words of extra buffer space (0K-2K) <0K>? 2K
You have 327 general + 142 FIP small buffers.
Adjusting memory table


Memory allocation table:

  0K: 00000000 - 00233777 (  39K) : EXEC
 39K: 00234000 - 00247777 (   3K) : RTS (RSX)
 42K: 00250000 - 00343777 (  15K) : XBUF
 57K: 00340000 - 00757777 (  67K) : USER
124K: 00760000 - End              : NXM

Table suboption? (LF)
```

BUFFERS

Explanation — BUFFERS prints the range you can specify for your system. In the example installation, the range is 0K–words to 2K–words. The default value is zero when you answer this question for the first time. The next time you select the BUFFERS suboption, the default value is the value you selected the last time you answered the question.

The range is larger for systems with processors that have data space. If you have data space, you can use the BUFFERS suboption to increase the memory reserved for the small buffer pool to accommodate more general and FIP small buffers. If you do not have data space, you can increase the memory reserved for the small buffer pool to accommodate only FIP small buffers. (You must perform another system generation to add more general small buffers if you do not have data space.)

Response — Type the number of K–words to reserve for the small buffer pool. DIGITAL recommends you specify the maximum. You can lower this later if you discover your system continually has over 250 free small buffers.

After your response, BUFFERS prints the number of general and FIP small buffers that your system will have available for use during timesharing. Of the memory added, BUFFERS creates as many general small buffers as it can (if you have data space) and gives the remaining space to FIP small buffers. In the example installation, the response of 2K accommodates 124 FIP small buffers.

When you increase memory for the small buffer pool, the size of the monitor increases and the size of user memory decreases. DEFAULT positions the primary run-time system and the extended buffer pool at the lowest available addresses, and then it lists the memory allocation table.

The following should help you further in answering this question. Remember that in Task 6 of Phase 4 you answered the Small buffers? configuration question. DIGITAL recommended you accept the default response, which indicated how many general small buffers you currently had. Because the size of the RSTS/E monitor is always rounded up to a multiple of 1K–word, there is usually some extra space. The RSTS/E monitor fills this extra space with FIP small buffers.

Remember also that the SYSBAT.SAV program, which you ran in Phase 5, printed a table that shows how many general and FIP small buffers you currently have. In addition, the table tells you how many you can add in Phase 7. Figure 13 shows the table that SYSBAT printed for the example installation. The table tells how many general and FIP small buffers you can add if you have data space and how many FIP small buffers you can add if you do not have data space. Because the example installation does not have data space, it can only increase memory for the FIP small buffer pool to accommodate more FIP small buffers. However, the table also states that the example installation can answer 679 to the Small buffers? configuration question if it performs another system generation.

Study the table SYSBAT printed for your installation.

```
Resident monitor size is 37K. By increasing this size
with the DEFAULT option of INIT, you can get additional
small buffers. This table shows the number and type of
small buffers you can get with each size change.

Additional                   Number of buffers
K-words of      With Data Space                  Without Data Space
buffer space     General    FIP                    General    FIP
----------------------------------------------------------------------
0K                  327       0                       327        0
1K                  386       4                       327       64
2K                  455       0                       327      124
3K                  514       4                       ---      ---
4K                  514      68                       ---      ---
5K                  514     132                       ---      ---
6K                  514     196                       ---      ---
7K                  514     254                       ---      ---

If you choose to run SYSGEN again, you may specify up
to 679 small buffers for this system. Doing so will
increase some of the buffer counts in the table.
```

Figure 13: Small Buffer Table Printed by SYSBAT

A K–word is equal to 64 small buffers; however, when you select the maximum number, the last K–word generally contains fewer than the 64 maximum. When selecting the amount of extra buffer space, you should determine how many buffers the last K–word contains and decide if you want to allocate 1K–word of memory for the number of buffers you gain. For example, if the difference between specifying 2K– or 3K–words of extra buffer space gives you only 10 more small buffers, it may not be worth the cost of 1K–word of physical memory.

Go to any other task in this section, according to the needs of your installation.

If you do not need to perform any other tasks in this section, type EXIT or press LINE FEED to continue with Task 2, (Establish RSTS/E Monitor Defaults) in Phase 7.

File-Related Tasks

During Phase 2 of system generation you were instructed to perform two file-related tasks: listing the file status table and creating your system files. You can also perform two other file-related tasks, either during system generation, or during day-to-day system management.

You complete these file-related tasks by using the REFRESH suboptions associated with INIT.SYS. The tasks you might have to perform are:

- Changing Account [0,1] File Characteristics (REFRESH FILE)
- Expanding the Bad Block File (REFRESH BADS)

You need not perform all of these tasks, only those applicable to your installation. Unless otherwise indicated, you need not perform these tasks in the order they appear here.

Go to the task(s) that apply to your installation.

Changing Account [0,1] File Characteristics (REFRESH FILE)

This task tells how to create, delete, or mark as deletable (or nondeletable) the files that reside in account [0,1]. You should perform this task if:

- You need to delete obsolete run-time system files (files with file types of RTS).
- You need to mark other files (usually application files that you create) as deletable or nondeletable.

Note

You can never modify the characteristics of the INIT.SYS, ERR.ERR, and installed monitor SIL files, which are located on the system disk.

Terminal Session

To change the characteristics of files in account [0,1], use FILE, a REFRESH suboption of INIT.SYS. This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In many cases, your response will differ from the response in red in the example installation.

If you want an online explanation, press RETURN after the question. The common REFRESH suboption error messages appear in Table 9, located in Task 10 of Phase 2. If your error message does not appear there, see Appendix A.

```
Option: REFRESH
15-DEC-82? (LF)
11:00 AM? (LF)
Disk? DM
Unit? 0
Rebuild? NO

REFRESH suboption? FILE
```

Explanation — As you did in Phase 2, you answer the questions asked by REFRESH. Then the REFRESH suboption? prompt appears.

Response — Type FILE or FI.

```
File name?

File exists. Delete it?
```

Explanation — The next question asks for the name of the file whose characteristics you want to change.

Response — Respond with a file name and type. If the file exists in account [0,1], FILE asks if you want to delete it. Type YES or NO. If your response is NO, FILE asks the next question. In the example installation, there is no response because no files need to be changed.

```
Size?
```

Response — To retain the current size, type OLD or press LINE FEED. Note that if you type any other response to this question, REFRESH may reallocate the file and you will lose the data.

```
Base?
```

Response — To retain the current location, type OLD or press LINE FEED. Note that if you type any other response to this question, REFRESH may reallocate the file and you will lose the data.

```
Deletable?
```

Explanation — This question asks if you want to mark a file as deletable or nondeletable. This feature is useful for installations that need to create other files. For example, you may want to mark as nondeletable some important accounting files. During day-to-day system management you use the PIP.SAV program to transfer these files to account [0,1]. Then you shut down your system and use the FILE suboption to mark these files as nondeletable.

Response — Type NO if you want to mark the file as nondeletable; type YES if you want to mark the file as deletable. Or, type OLD or press LINE FEED to retain the current status.

```
File name? (LF)

REFRESH suboption?
```

Response — Type another file name or press LINE FEED to return to the REFRESH suboption? prompt. To return to the Option: prompt type LINE FEED again. Or, specify another REFRESH suboption.

> ☞ If you need to perform it, go to the other task in this section.
>
> ☞ Otherwise, continue with Phase 3 of system generation.

Expand the Bad Block File (REFRESH BADS)

This task tells how to list the bad blocks currently in the bad block file (BADB.SYS) and how to add bad blocks to this file.

You should perform this task when blocks need to be removed from service because they have gone bad.

Terminal Session

To list the bad blocks and to add bad blocks to the BADB.SYS file, use BADS, a REFRESH suboption of INIT.SYS.

This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type a response at your console terminal. In many cases, your response will differ from the response given in the example installation, which is printed in red next to the question.

If you want an online explanation, press RETURN after the question. The common REFRESH suboption error messages appear in Table 9, located in Task 10 of Phase 2. If your error message does not appear there, see Appendix A.

```
Option: REFRESH
15-DEC-82? (LF)
11:00 AM? (LF)
Disk? DM
Unit? 0
Rebuild? NO

REFRESH suboption?
```

Explanation — As you did in Phase 2, you answer the questions asked by REFRESH. Then the REFRESH suboption? prompt appears.

Response — Type BADS, BAD, or BA. In the example installation, there is no response because the example installation has no need to add bad blocks to the BADB.SYS file.

```
Bads?
```

Explanation — The next question asks if you want to list the bad blocks or if you want to add bad blocks to the bad block file.

Response — To list the current contents of BADB.SYS, type LIST. BADS prints the contents or a message declaring that there are no bad blocks on this disk.

```
Bads?
```

Explanation — BADS returns to the Bads? question.

Response — Type ADD to add bad blocks to BADB.SYS.

```
Block number?
```

Response — Type the logical block number (in decimal) of the bad block. This number can range from 1 to the disk size minus 1. You can obtain the logical block number of a bad block from the ERRDIS printout of the disk error.

```
Really add logical block XXXX to BADB.SYS?
```

Response — This question asks if the number you specified is the one you want added to BADB.SYS. Type YES to add it. If your response is YES, BADS allocates the pack cluster in which the block resides to BADB.SYS. (Be careful, the allocation of a cluster to BADB.SYS is irrevocable.)

Type NO if you do not want to add it to this file. If you type NO, BADS repeats the Block number? question.

```
Bads?

Disk is being rebuilt - wait ...

REFRESH suboption?
```

Response — To return to the Option: prompt, press LINE FEED again. If you added any bad blocks, REFRESH rebuilds the disk. The rebuilding operation allows you to delete all files that contain bad blocks.

> If you need to perform it, go to the other task in this section.
>
> Otherwise, continue with Phase 3 of system generation.

Bootstrap-Related Task

During Phase 1 of system generation you were instructed to bootstrap your distribution tape or disk by activating a hardware bootstrap loader. (The hardware bootstrap loaders are described in Appendix E.) You can also simulate the hardware bootstrap loaders by using the BOOT option of INIT.SYS.

Bootstrapping Devices (BOOT)

This task tells how to bootstrap magnetic tape and disk devices. You should perform this task if:

- You need to load another PDP–11 monitor into memory from disk or tape.
- You need to reload an altered copy of INIT.SYS after you have patched it on disk.

Terminal Session

To bootstrap a magnetic tape or disk use BOOT, an INIT.SYS option. This terminal session provides the questions, explains them, and gives you some possible responses. After you understand the question, type the response at your console terminal. In many cases, your response will differ from the response given in the example installation, which is printed in red next to the question.

If you want an online explanation, press RETURN after the question. The common BOOT error messages appear in Table 22. If your error message does not appear there, see Appendix A.

```
Option: BOOT
Boot device:
Boot unit:
```

Response — Type BOOT or BO to the Option: prompt. BOOT then asks for the device designator and unit number of the tape or disk you want to boot. You can press RETURN to the Boot device: prompt to get a list of bootable devices. If you press LINE FEED the system disk is bootstrapped. BOOT automatically determines the system device and unit number. This is useful for loading a patched version of INIT.SYS.

After booting the device, BOOT returns to the Option: prompt.

☞ Continue with system generation.

Table 22: BOOT Error Messages

Message and Meaning
`NOT A VALID BOOT DEVICE` The device you named is not a valid bootable device or you specified a unit number for a DF disk. Press RETURN for a list of devices that can be bootstrapped.
`SORRY, BUT THAT DEVICE DOESN'T EXIST` The device name you typed is valid, but the device does not exist on this PDP–11.

How to Perform an Upgrade

Performing a system generation to upgrade a previous version of RSTS/E (V7.1, V7.2, or earlier) to RSTS/E version 8.0 is similar to building a new RSTS/E monitor, which is described in Part One of this manual. Part Two of this manual outlines a number of tasks you perform to upgrade a previous version of RSTS/E to version 8.0. You should be familiar with the following system programs before attempting the upgrade:

- BACKUP
- REACT
- MONEY
- PIP

BACKUP, REACT, and MONEY are described in the *RSTS/E System Manager's Guide*. PIP is described in the *RSTS/E User's Guide*. You should also be familiar with the following INIT.SYS program options, which are discussed in Part One of this manual:

- SET LIST
- HARDWR LIST
- DEFAULT
- START

Figure 13 is a flowchart that outlines how to do a system generation to upgrade an existing RSTS/E monitor. Keep the flowchart handy when you are performing the upgrade.

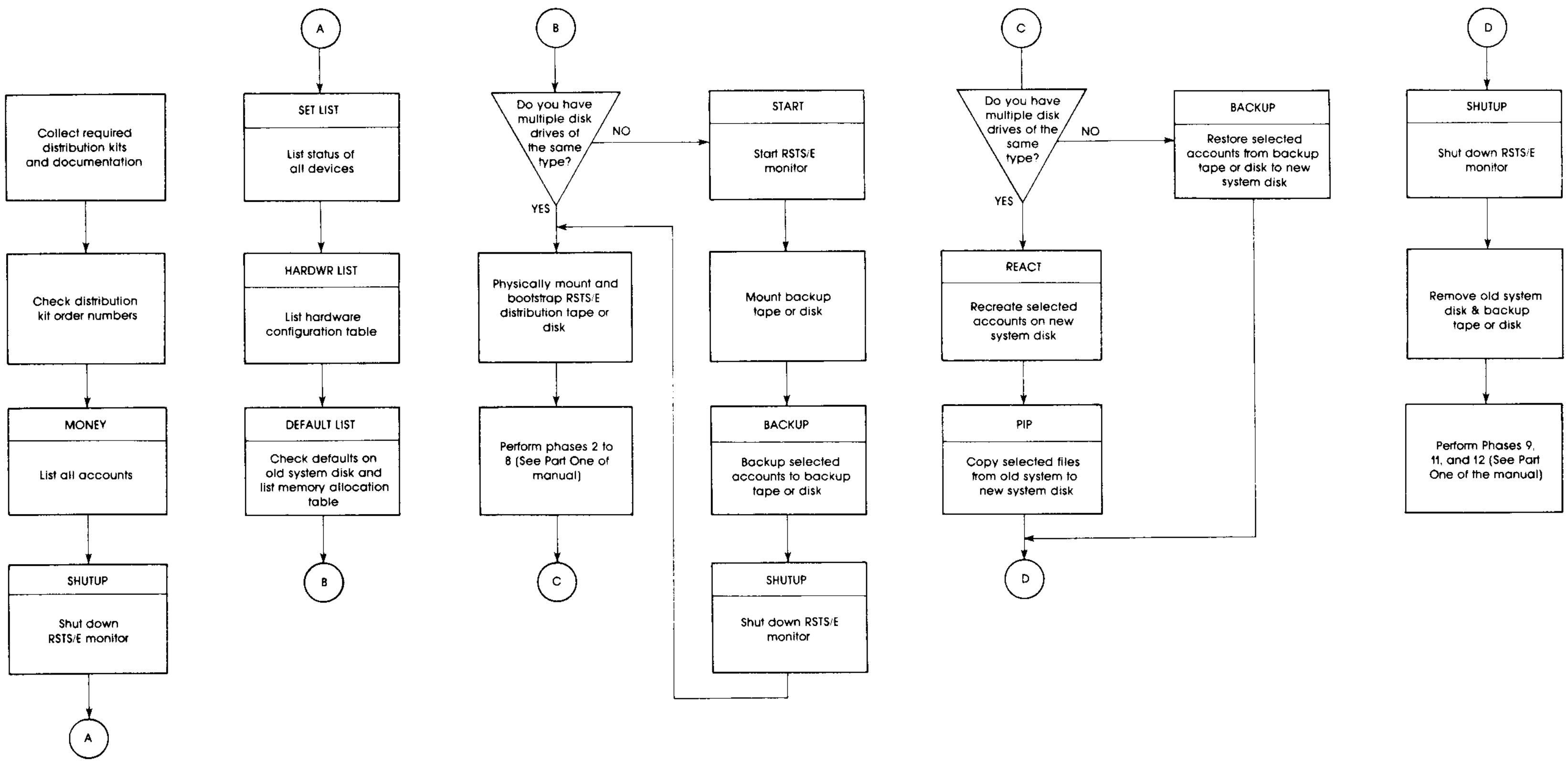


Figure 14: Performing a System Generation to Upgrade a RSTS/E Monitor

The following lists the steps you should do for the upgrade. Because you may use other methods to perform an upgrade, DIGITAL has supplied a Reader's Comments form at the end of this section. Please use this form to tell us how you perform an upgrade system generation.

1. Collect required distribution kits and documentation. (See Phase 1 Task 1 in Part One of this manual.)

2. Check distribution kit order numbers. (See Phase 1 Task 2 in Part One of this manual.)

3. List all of your accounts, using the MONEY system program. You will use this list to determine which accounts to transfer to your new system disk.

4. Shut down your RSTS/E monitor, using the SHUTUP system program.

5. Use the LIST suboption of SET to list all of your devices. This list may be useful when you specify device characteristics on your new system disk.

6. Use the LIST suboption of HARDWR to list the hardware configuration table. The hardware configuration table may be useful when you specify hardware characteristics on your new system disk.

7. Use the DEFAULT option to check the defaults on your old system disk. Wher you get to the Table suboption? prompt, answer YES. Then use the memory allocation table suboption LIST to list the current memory allocation table. Exit from the memory allocation table suboptions and complete the DEFAULT questions. You can use these lists to help you establish defaults and make changes to the memory allocation table for the new system disk.

8. If you do not have multiple disk drives of the same type, use the START option of INIT.SYS to start your RSTS/E monitor. (If you have multiple disk drives of the same type, go to step 12.) When you get to the Command File Name? question, press CTRL/C. By pressing CTRL/C, you prevent any user from inadvertently logging in and making changes to files. Pressing CTRL/C gets you into account [1,2], where you can run the system programs required for the upgrade.

   After you press CTRL/C, you see the angle bracket prompt (>), if your primary run-time system is RSX or the Ready prompt, if your primary run-time system is BASIC–PLUS.

9. Physically mount a backup tape; or, physically and logically mount a backup disk.

10. Transfer selected accounts to the backup tape or disk, using the BACKUP system program. (If BACKUP is located on a disk other than your system disk, logically mount that disk first. Then, run BACKUP from that disk.) Use the list of accounts printed by MONEY to determine which accounts to transfer to the backup tape or disk. You might consider transferring all accounts except *.SYS in account [0,1] and the accounts that contain system programs associated with the BUILD, SPLER, BIGPRG, BACKUP, DEVTST, DCL, and HELP control files.

The *.SYS account in account [0,1] contains the swap files and any other system files you may have created. You will create new swap files and other system files during the upgrade. Likewise, you will process these control files again during the upgrade; thus, there is no need to transfer them to your backup tape or disk.

Be sure to print a list of all the accounts you transferred to the backup tape or disk. When you do the backup, remember that BACKUP does not transfer empty accounts. As a result, BACKUP will not recreate these empty accounts on your new system disk. For example, if account [50,50] is an empty account, BACKUP will not restore it to your new system disk. Therefore, you will have to recreate the empty account on your new system disk using the REACT program.

After you back up selected accounts, remove the backup tape or disk.

11. Shut down your RSTS/E monitor, again using SHUTUP, and physically remove your old system disk.

12. Physically mount your RSTS/E distribution tape or disk. (See Phase 1 Task 3A in Part One of this manual for instructions and an example of how to mount and bootstrap a distribution tape; see Phase 1 Task 3B in Part One of this manual for instructions and an example of how to mount and bootstrap a distribution disk.)

13. See Part One of this manual and do all of the tasks associated with Phases 2 to 8. When you get to Phase 8, see the *RSTS/E Release Notes* for a list of bundled and optional software (for example, RMS–11, BASIC–PLUS–2, and so forth) that you might need to rebuild.

14. If you do not have multiple disk drives of the same type, mount your backup tape or and disk and run BACKUP to restore the accounts you saved earlier to your new system disk. Answer NONE to the Supersede? question to avoid restoring files that have already been created on your new system disk.

15. If you have multiple disk drives of the same type, physically and logically mount your original system disk. Then recreate selected accounts on your new system disk, using the REACT system program.

    After you recreate all of your selected accounts, copy the accounts from your old system disk to your new system disk, using the PIP system program. Use the no supersede (/NOS) switch to ensure that PIP does not copy a file that already exists. Use the watch (/W) switch to have PIP display the names of the files it is copying to your new system disk. See the *RSTS/E User's Guide* for instructions on how to use PIP.

16. Shut down your RSTS/E monitor using the SHUTUP system program.

17. Remove your old system disk and backup tape or disk (if used).

18. See Part One of this manual and do all the tasks associated with Phases 9, 11, and 12.

Reader's Comments For Upgrade Instructions

Note: This form is for document comments only. DIGITAL will use comments submitted on this form at the company's discretion. If you require a written reply and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Did you find the instructions on how to perform an upgrade adequate and applicable to your system? ______

Would you care to list the steps you take when performing an upgrade? ______

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How to Perform an Online System Generation

You can build additional version 8.0 RSTS/E monitors and/or BASIC–PLUS run-time systems online, using a previously generated V8.0 monitor.

Note

> You cannot perform an online system generation to build a version 8.0 RSTS/E monitor or BASIC–PLUS run-time system from a version 7.2 or earlier monitor.

You can use the monitors and run-time systems you build as replacements for the previous monitor and run-time systems; or, you can store them on the system disk for occasional use.

To perform an online system generation, you should already have done several system generations. You should be familiar with the INIT.SYS program options and the SYSGEN and SYSBAT programs, which are discussed in Part One of this manual. You should also be familiar with the UTILTY system program, described in the *RSTS/E System Manager's Guide*. Figure 14 is a flowchart that shows the tasks necessary to perform an online system generation. Keep the flowchart handy when you are performing an online system generation.

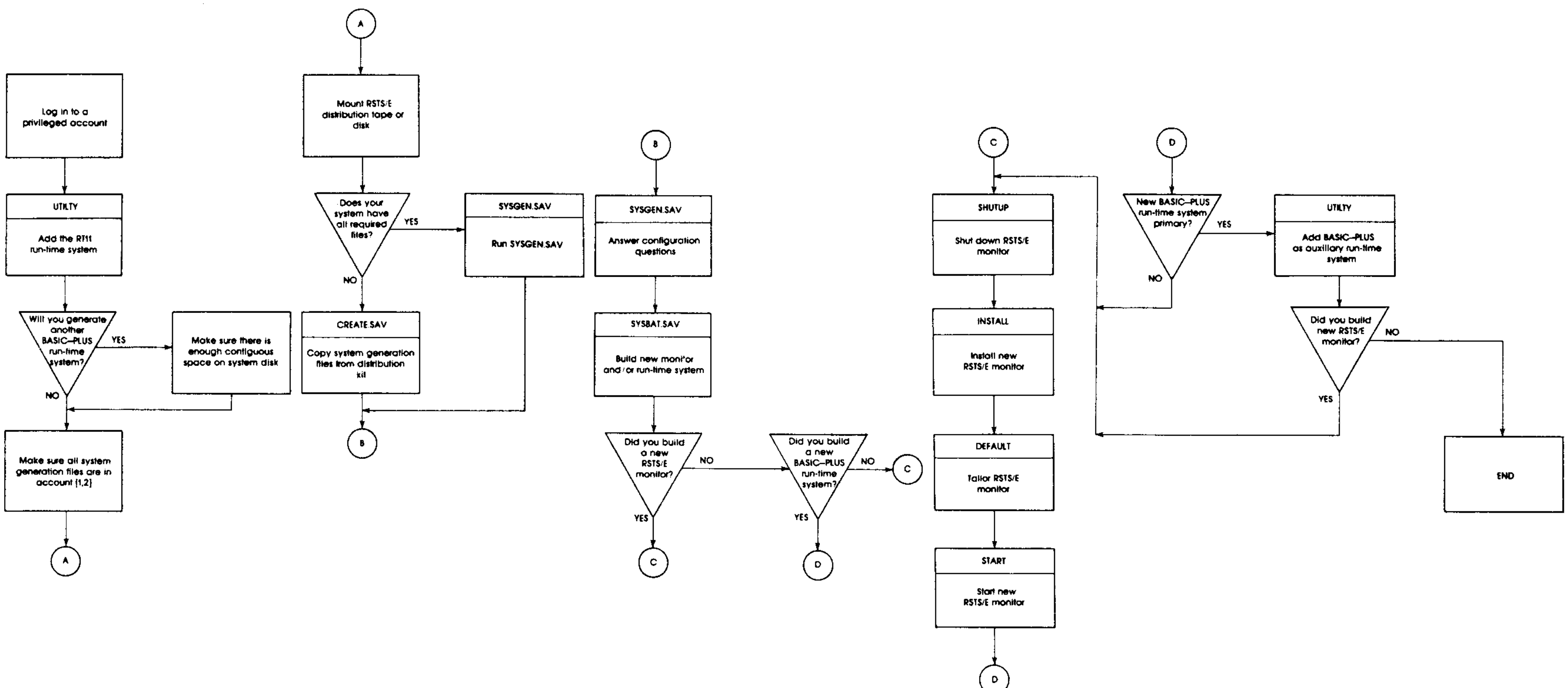

Figure 15: Online System Generation

The following lists the tasks you should do for the online system generation. Because you may use other methods to perform an online system generation, DIGITAL has supplied a Reader's Comments form at the end of this section. Please use this form to tell us about how you perform an online system generation.

1. Log in to a privileged account.
2. Add RT11 as a run-time system, using the UTILTY system program.
3. If you plan to generate another BASIC–PLUS run-time system, make sure the system disk has about 70 contiguous blocks of space to accommodate it. Use the BASIC–PLUS OPEN statement with the contiguous MODE specification (16) to open a file of the approximate size of the additional BASIC–PLUS run-time system. If you want to check to make sure you have enough contiguous space, use this PIP command to create a file of 70 blocks:

   ```
   PIP X.X/SI:70/MO:16= NL:
   ```

   If PIP creates the file, you have enough contiguous space. Delete the file using the command:

   ```
   PIP X.X/DE
   ```

   If PIP fails to create the file, you do not have enough contiguous space on the system disk. You must delete or transfer files to free contiguous space.
4. Make sure your system disk contains these system generation files in the system library account [1,2]. The following is a partial list:
   - SYSGEN.SAV
   - SYSBAT.SAV
   - MACRO.SAV
   - CREF.SAV
   - PIP.SAV
   - LINK.SAV
   - SILUS.SAV
   - HOOK.SAV
   - ERR.STB
5. Mount the version 8.0 RSTS/E distribution tape or disk. (Use the MOUNT command to logically mount the RSTS/E distribution kit if it is a disk. Specify the /RO switch to make the distribution disk a read-only device.)
6. If your system disk does not have all the required system generation files, type the command: RUN dev: $CREATE.SAV to copy the remaining system generation files to your system disk (dev: represents the device designator of your RSTS/E distribution kit). (Note that this will cause CREATE.SAV to overlay existing versions of the system generation files.)

   The CREATE.SAV program then chains to the SYSGEN.SAV program, which asks the configuration questions.

7. If your system disk has all the required system generation files, type: RUN $SYSGEN, which asks the configuration questions.

8. Answer the Generate monitor? and Generate BASIC–PLUS? configuration questions according to whether you want both the monitor and run-time system, only the monitor, or only a run-time sytem. Specify a different name to the Monitor name? question if you want to keep your current monitor as a backup.

   Specify a different name to the BASIC–PLUS RTS name? question if you want to keep the current BASIC–PLUS run-time system. (See Phase 4 in Part One of this manual for instructions on answering the configuration questions.)

9. After you answer all the questions, type RUN $SYSBAT to build the monitor and/or BASIC–PLUS run-time system. (See Phase 5 in Part One of this manual for more detailed instructions.)

10. If you built a new BASIC–PLUS run-time system, decide whether you want it as a primary or auxiliary run-time system. If you want it as an auxiliary run-time system, use the UTILTY program to add it as an auxiliary run-time system. If you also built a monitor, go to Step 11; otherwise, you are finished.

    If you want BASIC–PLUS as a primary run-time system, continue with Step 11. If you make the new BASIC–PLUS run-time system your primary run-time system, make sure you make the necessary changes to LOGIN.BAC. Otherwise, you will not be able to start RSTS/E again.

11. After SYSBAT builds the monitor and/or BASIC–PLUS run-time system, shut down the SYSGEN monitor. (See Phase 6 in Part One of this manual for more detailed instructions.)

12. Use the INSTALL option of INIT.SYS to install the new RSTS/E monitor.

13. Tailor the new RSTS/E monitor. (See Phase 7 in Part One of this manual for instructions on how to tailor the RSTS/E monitor.)

14. Use the START option to start the new RSTS/E monitor.

RSTS/E
System Generation Manual
AA–2669G–TC

Reader's Comments For Online Instructions

Note: This form is for document comments only. DIGITAL will use comments submitted on this form at the company's discretion. If you require a written reply and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Did you find the instructions on how to perform an online system generation adequate and applicable to your system? ______________________________

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Would you care to list the steps you take when performing an online system generation? ______

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System Generation Error Messages A

A.1 Initialization Code Error Messages

The RSTS/E system initialization code routines make many checks to ensure the consistency of system structures. Initialization routines compare existing structures with their definitions and with references in other parts of the system. The checks must be successful; if not, the routines detect a consistency error, which indicates that the system is corrupted.

The initialization routines may also encounter errors while attempting to execute initialization options. The error text for many of these errors is preceded by the message FATAL RSTS/E SYSTEM INITIALIZATION ERROR. The initialization code prints a descriptive error message and returns to the Option: prompt. If such an error occurs, follow the error recovery procedures in Table A–1. If these procedures are unsuccessful, consult your DIGITAL Software Support Specialist.

For many of the errors, no recovery procedures exist. If such an error occurs, you should submit a Software Performance Report (SPR) as noted in the recovery procedures column for that error message.

Table A–1: Initialization Code Error Messages

Message and Recovery Procedure
`ACCOUNT [1,2] MISSING FROM OUTPUT DISK` Reinitialize the disk as a system disk and create the library account.
`BAD [0,1] DIRECTORY` Reboot the system disk and retry the operation. If the retry fails, use DSKINT to reinitialize the disk.
`BADB.SYS NOT FOUND - RESULTS UNPREDICTABLE` Reboot the system disk and retry the operation. If the retry fails, use DSKINT to reinitialize the disk.
`BUFF.SYS NOT FOUND OR TOO SMALL-DECTAPE DISABLED` Warning message only. Shut down the system and use REFRESH to create the file at the required size.
`CANNOT REFRESH THIS DISK` Reinitialize the disk.
`CANNOT START WITH THIS SWAP MAX AND MEMORY TABLE` Use DEFAULT to change the swap max and/or memory allocation table.

(continued on next page)

Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`CLUSTER 1 (REQUIRED FOR MFD) CONTAINS A BAD BLOCK` If the pack cluster size for the disk is greater than the device cluster size, use DSKINT to reinitialize the disk with a lower pack cluster size. If the error recurs, use a different disk.
`CLUSTER ALLOCATED TO [P,PN] filnam.typ IS NOT ON A PACK CLUSTER BOUNDARY` REBUILD asks whether to delete the file, then confirms your response.
`[P,PN] CLUSTER MAP IN UFD DISAGREES WITH MFD` REBUILD asks whether to zero the account and confirms your response.
`DEFAULT RTS HAS INVALID SIZE PARAMETERS` Regenerate the run-time system.
`DEFAULT RTS NOT FOUND OR INVALID` Ensure that a valid run-time system is on the system disk. Regenerate the run-time system if necessary.
`DEVICE xx: DOES NOT INTERRUPT - DEVICE DISABLED` Use HARDWR to set the correct vector address for xx: or call the DIGITAL field service engineer.

`DEVICE CONTROLLER TABLE (DDCTBL) DECLARES TOO MANY UNITS FOR CONTROLLER`
`SIL CANNOT BE INSTALLED`
Submit an SPR.

`DEVICE CONTROLLER TABLE (DDCTBL) HAS AN ILLEGAL FORMAT`
`SIL CANNOT BE INSTALLED`
Submit an SPR. You may have a corrupt distribution kit.

`DEVICE ERROR WHEN TRYING TO BOOTSTRAP DEVICE` Ensure that the device is online and ready. If the error recurs, try a different device.
`DEVICE HUNG OR WRITE-LOCKED` Ensure that the device is online and ready. If the error recurs, try a different device.
`DEVICE XD0: CSR MUST BE DECLARED WITH HARDWR, CSR SUB-OPTION - DEVICE DISABLED` Use the CSR suboption of HARDWR to set the correct CSR address for XDn:. The XD device is not located at a DIGITAL standard CSR assignment.
`DEVICE XD0: TIMED-OUT ON INTERNAL MICRO-DIAGNOSTIC CHECK - DEVICE DISABLED` Call your DIGITAL field service engineer. The error message indicates that INIT encountered a device time-out error. You can determine the actual device type by checking byte 4 of the CSR set.
`DIRECTORY ENTRY FOR [P,PN] filnam.typ CONTAINS PACK CLUSTER NUMBER WHICH IS TOO BIG` REBUILD asks whether to delete the file and confirms your response.
`DIRECTORY ERROR DETECTED IN RDB` Reinitialize the disk.
`DIRECTORY ERROR - FILE NOT FOUND` Reinitialize the disk.
`[0,1] DIRECTORY NOT FOUND` Reinitialize the disk.

(continued on next page)

Table A-1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`DISK BLOCK 0 (REQUIRED FOR BOOTSTRAPS) IS BAD` Reinitialize the disk. If the error recurs, use a different disk.
`DISK ERROR DURING DSKINT BUILD PHASE` Reinitialize the disk. If the error recurs, use a different disk.
`DISK HUNG OR DATA ERROR DURING OVERLAY` Ensure that the device is online and ready. If the error recurs, try a different device.
`DISK STRUCTURE IS IRREVOCABLY CORRUPT` Reinitialize the disk.
`DOUBLY ALLOCATED BLOCK FOUND AT DEVICE CLUSTER nn. THE BLOCK IS ALLOCATED TO [p,pn] filnam.typ AND [p,pn] filnam.typ` REBUILD lets you choose the file to delete, then confirms your response.
`DRIVE NOT READY:` Ensure that the disk drive is online and READY. Press LINE FEED to retry the operation. Type any other character to abort the operation.
`DSKINT ERROR - ATTEMPT TO FORMAT UNFORMATTABLE DISK` Submit an SPR.
`DSKINT OR SYSGEN ERROR - DSKINT ALLOCATION FAILURE` Submit an SPR.
`EOF READING INIT.SYS` Submit an SPR.
`ERR FILE INVALID` Copy the file ERR.ERR from the distribution medium to the system disk and use the DEFAULT option to install ERR.ERR as the system default.
`ERR FILE NOT FOUND` Copy the file ERR.ERR from the distribution medium to the system disk and use the DEFAULT option to install ERR.ERR as the system default.
`ERROR DETECTED WHILE READING ERROR RECORD SECTOR #n` Warning message only. Error occurred during reading of factory error records. Disregard the error message.
`ERROR - KB INTERFACES OUT OF SEQUENCE` Regenerate your monitor. If the problem recurs, submit an SPR.
`ERROR-NO SETUP FOR DISK xx:` Regenerate your monitor. If the problem recurs, submit an SPR.
`ERROR-UNKNOWN DISK xx:` Regenerate your monitor. If the problem recurs, submit an SPR.
`EXCESSIVE BAD CLUSTERS` If you need to use the current disk, use DSKINT to increase the pack cluster size. If the error recurs, use a different disk.
`FATAL DISK ERROR DURING CONTROL RESET` Retry the DSKINT. If the error recurs, call the DIGITAL field service engineer to repair the disk drive.
`FATAL ERROR - NO SMALL BUFFERS LEFT` Regenerate the system and configure more small buffers.

(continued on next page)

Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
FATAL I/O DURING OVERLAY Ensure that the device is online and ready. If the error recurs, try a different device.
xxx FILE NOT FOUND WHEN REMOVING IT Warning message only. xxx is SIL, RTS, or ERR. The initialization code did not find a file when trying to make it deletable.
[P,PN] filnam.typ HAS A BAD BLOCK REBUILD asks whether to delete the file and confirms your response.
[P,PN] filnam.typ HAS FIRST DCN OUT OF RANGE REBUILD asks whether to zero the account and confirms your response.
[P,PN] filnam.typ HAS INVALID ACCOUNTING ENTRY LINK REBUILD asks whether to delete the file and confirms your response.
filnam.typ HAS ILLEGAL FORMAT AND CANNOT BE COPIED Submit an SPR if DIGITAL supplied the file on the distribution medium. Regenerate your system monitor if the system generation process created the file.
FORMATTING FAILURE: Press LINE FEED to retry. Type anything else to abort the DSKINT and return to the Option: prompt. Ensure that the disk drive is write enabled. This error may indicate a bad disk pack or a bad disk drive.
[P,PN] HAS A BAD BLOCK REBUILD asks whether to delete the account and confirms your response.
[P,PN] HAS HOLES IN CLUSTER MAP REBUILD asks whether to zero the account and confirms your response.
[P,PN] HAS INCONSISTENT CLUSTER MAPS REBUILD asks whether to zero the account and confirms your response.
[P,PN] HAS INVALID CLUSTER SIZE REBUILD asks whether to delete the account and confirms your response.
ILLEGAL CONTROLLER FOR TU58 Submit an SPR.
ILLEGAL INTERFACE INDEX nn Regenerate your monitor. If the error recurs, submit an SPR.
INIT BUG - BAD DISK INDEX Submit an SPR and a copy of INIT.SYS.
INIT BUG - CAN'T ALLOCATE FILE 2ND TIME Submit an SPR and a copy of INIT.SYS.
INIT BUG - CAN'T CHECK PARITY Submit an SPR and a copy of INIT.SYS.
INIT BUG - CAN'T FIND [0,1] AGAIN Submit an SPR and a copy of INIT.SYS.
INIT BUG - CAN'T FIND FILE TO DELETE Submit an SPR and a copy of INIT.SYS.
INIT BUG - REBUILD FAILED TO FIND ALLOCATION ERROR Submit an SPR and a copy of INIT.SYS.
INIT BUG - DIDN'T GET SAME CLUSTER 2ND TIME Submit an SPR and a copy of INIT.SYS.

(continued on next page)

Table A-1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`INIT BUG - DIDN'T GET SAME FILE CLUSTER 2ND TIME` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - DON'T KNOW HOW TO START` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - FAILED TO CREATE FILE` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - FAILED TO FIND FILE AGAIN` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - FAILED TO FIND FILE JUST CREATED` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - FILE EXISTS WHEN TRYING TO CREATE` Submit an SPR and a copy of INIT.SYS.
`INIT BUG -xxx-file type FILE NOT FOUND 2ND TIME` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - xxx - FILE NOT FOUND WHEN REMOVING IT` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - FILE SIZE COMPUTED WRONG` Ensure that the system device you are using contains a valid system. If so, submit an SPR and a copy of INIT.SYS.
`INIT BUG - FLOAT TABLE ERROR` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - INSTALL NOT SYNCHRONIZED at xxxxxx` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - NO SATT.SYS AT WIPEOUT TIME` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - NO UFD FOUND IN CREATE` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - RNB TO WRONG DISK` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - SATT.SYS NONEXISTENT AT TIME OF WOMP` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - SET NEW TABLE TOO SMALL` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - UNKNOWN BAE DEVICE` Submit an SPR and a copy of INIT.SYS.
`INIT BUG - START LINKED TOO LOW` Submit an SPR and a copy of INIT.SYS.
`INIT LINK BUG - DEFBUF NOT ALIGNED` Submit an SPR.
`INIT LINK BUG - DSTBL TOO LOW` Submit an SPR.
`INIT LINK BUG - FIBUF NOT ALIGNED` Submit an SPR.

(continued on next page)

Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`INIT LINK BUG - INSBUF NOT ALIGNED` Submit an SPR.
`INIT LINK BUG - SATBUF NOT ALIGNED` Submit an SPR.
`INIT.SYS NOT FOUND - RESULTS ARE UNPREDICTABLE` Reboot the system disk and retry the operation. If the retry fails, reinitialize the disk.
`INPUT FILE MISSING FROM SYSTEM DEVICE` Retry the procedure that generated the error. If the error recurs, submit an SPR.
`INSTALLED MONITOR DOES NOT SUPPORT THIS SYSTEM DISK` Regenerate a monitor that supports the system disk or use the COPY option to transfer the monitor to a disk it supports.
`INSTALLED SIL INVALID` The installed SIL is invalid as a monitor SIL. Use the INSTALL option to install a valid SIL.
`INVALID DATA IN ERROR RECORD SECTOR #n` Warning message only. The error occurred during reading of factory error records. Disregard the error message.
`INVALID RETRIEVAL ENTRIES FOR FILE [p,pn] filnam.typ - FIXED BY REBUILD` Warning message. REBUILD truncates the file.
`I/O TO UNOPENED FILE` Submit an SPR.
`[P,PN] IS NOT A VALID ACCOUNT NUMBER` REBUILD asks whether to delete the account and confirms your response.
`MEMORY ADDRESSING PROBLEM` Either the memory subsystem or the memory management hardware failed.
`MFD NAME ENTRY CONTAINS A BAD LINK. REBUILD WILL DELETE ALL [1,1] FILES AND ALL ACCOUNTS BEYOND [p,pn] filnam.typ` REBUILD confirms your response.
`MONITOR SIL CHANGED - REINSTALL IT` Use the INSTALL option to install the monitor SIL.
`MONITOR SIL NOT FOUND` Use the INSTALL option again to install the SIL. If the error recurs, submit an SPR.
`MT, MS, MM ERROR OR INVALID FORMAT ON TAPE` Ensure that the tape drive heads are clean and correctly aligned. If the error recurs, try using a different drive.
`NO LIBRARY ACCOUNT ON THIS DISK` Reinitialize the disk and create a library account.
`NO ROOM FOR DIRECTORY ON OUTPUT DISK` Delete files, reinitialize the disk to create sufficient contiguous space on the disk for the file, or use a different disk.
`NO ROOM FOR FILE ON OUTPUT DISK` Delete files, reinitialize the disk to create sufficient contiguous space on the disk for the new file, or use a different disk.

(continued on next page)

Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`NO ROOM FOR 2 JOBS IN SWAP.SYS` Use REFRESH to increase the size of SWAP.SYS so that it can accommodate two jobs of size SWAP MAX.
`NOT ENOUGH ROOM IN LOW MEMORY FOR MONITOR` Generate a smaller monitor. INIT cannot find enough contiguous, physical memory to place the monitor in low memory. Before printing this message, INIT attempts to position the monitor in the memory table, tries to reset the table, and prints the message ADJUSTING MEMORY TABLE at your terminal. When INIT cannot find enough space for the monitor, it prints the "not enough room" message and returns to the Option: prompt. You can then begin to generate a smaller monitor.
`NOT ENOUGH ROOM IN MEMORY FOR RUN TIME SYSTEM` Generate a smaller run-time system or monitor. INIT cannot find enough physical memory for the run-time system. Before printing this message, INIT attempts to position the run-time system in the memory table, tries to reset the table, and prints the message ADJUSTING MEMORY TABLE at your terminal. When INIT cannot find enough space, it prints the "not enough room" message and returns to the Option: prompt. The prompt allows you to begin generating a smaller run-time system or monitor.
`NOT EVERYTHING FITS IN MEMORY WITH THIS MEMORY TABLE. RESETTING MEMORY TABLE AND ELIMINATING EXTRA BUFFERS` This message can occur after you select a bigger primary run-time system, allocate extra small buffers, or install a monitor patch that reduces monitor size.
`ONE OR MORE SYSTEM FILES MISSING` Reinitialize the disk.
`OPTION ATTEMPTED DURING BOOTSTRAP PHASE` Rebootstrap the system and retry the operation. If the retry fails, submit an SPR.
`OPTION NOT AVAILABLE` The option you requested is not available until you bootstrap the system disk.
`OUTPUT DISK IS DIRTY - CANNOT PROCEED` Use REFRESH to rebuild the disk or use DSKINT to reinitialize the disk.
`OUTPUT DISK IS NOT A SYSTEM DISK` Reinitialize the disk as a system disk.
`OVERLAY HANDLER IN ERROR` Submit an SPR and a copy of the SIL.
`OVR NOT IN SIL` Regenerate the monitor.
`PACK CLUSTER SIZE IS NOT 1, 2, 4, 8, OR 16` Reinitialize the disk.
`PARITY CSR FOUND, BUT NOT RELATING TO MEMORY` Call the DIGITAL field service engineer.
`PARITY CSR CONTROLS MORE THAN 31K` Call the DIGITAL field service engineer.
`PERMANENTLY MAPPED REGION OF MONITOR IS TOO LARGE` Regenerate to create smaller monitor. Configure fewer small buffers or fewer devices.
`PRIORITY OF xx:INTERRUPT (PRn) IS TOO HIGH - DEVICE DISABLED` Call the DIGITAL field service engineer to install the device correctly.

(continued on next page)

Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
QUESTION ATTEMPTED DURING AUTO-RESTART If the system disk needs rebuilding, start the system by typing START or LINE FEED, thereby rebuilding the disk. If any other problem occurs, submit an SPR.
REQUESTED DISK DRIVE NOT FOUND Request a disk that is on the system.
REQUIRED MODULE xxxxxx HAS INVALID LENGTH Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx HAS INVALID TRANSFER ADDRESS Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx HAS WRONG LOAD ADDRESS Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx IS IMPROPERLY LINKED Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx IS MISSING A REQUIRED SYMBOL Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx NOT FOUND IN SIL Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx OUT OF SEQUENCE IN SIL Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx TOO LARGE Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED MODULE xxxxxx TOO SMALL Regenerate the monitor. If the error recurs, submit an SPR.
REQUIRED SYMBOL xxxxxx MISSING FROM MONITOR Regenerate the monitor. If the error recurs, submit an SPR.
RL DISK MUST BE STRAPPED FOR 22-BIT ADDRESSING The system contains a QBUS and has more than 256KB of memory, thus requiring 22–bit addressing. The system also contains an RL disk controller, but the controller is not set up for 22–bit addressing. The controller must be an RLV12, and it must be strapped for 22–bit addressing.
RSTS/E REQUIRES AT LEAST 64K WORDS OF MEMORY Your configuration is too small for the system.
RSTS/E REQUIRES EIS! Correct the hardware configuration to include EIS instructions.
RSTS/E REQUIRES A CLOCK! Correct the hardware configuration to include a KW11P or KW11L clock.
RSTS/E REQUIRES MEMORY MANAGEMENT HARDWARE! Correct the hardware configuration to include a memory management unit.
SATT.SYS IS OVER 16 BLOCKS LONG If the file structure on the disk is sound, submit an SPR and a copy of the disk. Otherwise, reinitialize the disk.
SATT.SYS NON-EXISTENT AT TIME OF READ If the file structure on the disk is sound, submit an SPR. Otherwise, reinitialize the disk.
SATT.SYS NOT FOUND - RESULTS UNPREDICTABLE Reboot the system and retry the operation. If the error recurs, reinitialize the disk.

(continued on next page)

Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`filnam.SIL NOT FOUND - PLEASE INSTALL A SIL` The SIL that you previously installed is not on the disk. Use the INSTALL option to install a monitor SIL.
`SWAP.SYS NOT CONTIGUOUS OR TOO SMALL` Use the REFRESH option to create a contiguous SWAP.SYS of the correct size.
`SWAP.SYS NOT PRESENT IN [0,1]` Use the REFRESH option to create SWAP.SYS in [0,1].
`SYMBOL xxxxxx NOT FOUND IN MONITOR SYMBOL TABLE` Regenerate the monitor. If the problem recurs, submit an SPR.
`SYSTEM DISK DISABLED IN MONITOR` Use the SET option to enable the system disk device.
`TOO MANY BAE DEVICES` Submit an SPR.
`TOO MANY BLOCKS IN DEVICE CONFIGURATION TABLE` Regenerate the monitor.
`TOO MANY xx: CONTROLLERS GENERATED` Ensure that any edits to CONFIG.MAC are correct. If there are no editing errors, regenerate the system.
`TOO MANY RH OR UNIBUS DEVICES` Submit an SPR.
`TOO MANY SUBLINES FOR nn:` Ensure that any edits to CONFIG.MAC are correct. If there are no editing errors, regenerate the system.
`TOO MANY UNIBUS DEVICES ON THIS 11/70` First, disable unnecessary devices with HARDWR or SET. If the error condition persists, use DEFAULT to lock all memory addresses above 124K. (The computer runs in 18–bit addressing mode instead of 22–bit addressing mode.) If the error condition is present after you lock memory, or if the computer has 124K or fewer words of memory, submit an SPR.
`TOO MUCH MODIFICATION TO MONITOR REQUIRED` Regenerate to produce a monitor that is more closely configured to your system hardware.
`TU58 DEVTBL PACKET MISSING` Submit an SPR.
`TWO MAGTAPE UNITS HAVE THE SAME UNIT NUMBERS` Examine unit switches on magnetic tape drives and ensure that no two have the same unit number.
`UFD HAS SIZE TOO LARGE FOR FILE [p,pn] filnam.typ - FIXED BY REBUILD` Warning message only. REBUILD corrects the condition.
`UFD HAS SIZE TOO SMALL FOR FILE [p,pn] filnam.typ - FIXED BY REBUILD` Warning message only. REBUILD corrects the condition.
`[0,1] UFD NOT FOUND` Reinitialize the disk.
`UNABLE TO CREATE REQUESTED FILE(S)` Delete some files and retry the procedure, or request smaller files. Also, try using the FILE suboption of REFRESH to create files one at a time.

(continued on next page)

Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`UNEXPECTED OVERLAY TRAP` Submit an SPR.
`UNEXPECTED TRAP THROUGH THE VECTOR AT nnn. TRAP OCCURRED FROM PC = nnnnnn.` Submit an SPR.
`UNKNOWN DEVICE BOOTED` Submit an SPR.
`UNKNOWN RH CONTROLLER PRESENT` Call the DIGITAL field service engineer to correct the hardware configuration.
`UNRECOVERABLE DISK ERROR ON xxn:` Ensure that the disk is mounted and write enabled (if necessary). If the disk is properly mounted, this error indicates a fatal disk error. Reformat and reinitialize the disk, or use a different disk.
`USER-DEFINED ADDRESS FOR DEVICE xxn: NOT FOUND - DEVICE DISABLED` Use HARDWR to set the correct CSR address for xx:, or call the DIGITAL field service engineer.
`USING KW11L CLOCK` Warning message only. The installed SIL's defaults indicate a KW11P clock is preferred, but the KW11P clock is not present. RSTS/E uses the KW11L clock instead.
`USING KW11P CLOCK AT LINE FREQUENCY` Warning message only. The installed SIL is configured for KW11L clock, but the KW11L clock is not present. RSTS/E uses the KW11P clock instead.
`VECTOR FOR DEVICE xx: (nnnn) ALREADY IN USE - DEVICE DISABLED` Use HARDWR to set the correct vector address for xx:, or call the DIGITAL field service engineer.
`VECTOR TABLE FULL` Submit an SPR.
`WARNING - BAD BLOCK DOUBLY ALLOCATED TO BADB.SYS` Warning message only.
`WARNING - BOOTED DEVICE IS AT A NON-STANDARD CSR ADDRESS` The initialization code successfully bootstrapped the device. The device is at a DIGITAL non-standard CSR address, but the device has not been declared at the non-standard CSR address. Before starting your RSTS/E monitor, use CSR (a HARDWR suboption) to declare this device at the non-standard address.
`WARNING - DCN IN BADB.SYS TOO BIG` Warning message only. The file structure on the disk being rebuilt appears invalid.
`WARNING **DBn: IS DUAL PORTED, PROCEED WITH CAUTION` Warning message only.
`WARNING - DCN IN BADB.SYS NOT ON PACK CLUSTER BOUNDARY` Warning message only.
`WARNING - xxx FILE NOT FOUND - PLEASE SET DEFAULTS` The SIL you are installing specifies a primary run-time system or error message file that is not present. Use the DEFAULT option to specify a valid file.
`WARNING - FILE filnam.typ NOT FOUND WHEN REMOVING OLD SIL` Warning message only.

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Table A–1: Initialization Code Error Messages (Cont.)

Message and Recovery Procedure
`WARNING-LINK IN BADB.SYS IS BAD. BAD BLOCKS MAY BE LOST.` Warning message only.
`WARNING - MAIN MEMORY (cache) DISABLED AT STARTUP. RSTS/E WILL NOT USE (cache). SYSTEM MAY RUN SLOWLY.` Warning message only. (cache) is CACHE, CACHE GROUP 0, or CACHE GROUP 1.
`WARNING - MAIN MEMORY (cache) IS FAILING REPEATEDLY. RSTS/E WILL NOT USE (cache). SYSTEM MAY RUN SLOWLY.` Warning message only. (cache) is CACHE, CACHE GROUP 0, or CACHE GROUP 1.
`WARNING - NO SET UP FOR DEVICE xx` Submit an SPR. You may have either a corrupt distribution kit or incompatible versions of INIT.SYS and the monitor .SIL.
`WARNING - ODT IN THE SIL IS IN AN ILLEGAL FORMAT` Warning message only.
`WARNING - SUBLINES FOR xx: ARE OUT OF SEQUENCE` Warning message only, but the system may crash. Regenerate the monitor.
`XDn: DISABLED - LINE EXCEEDS CONTROLLER (XDn:) MAXIMUM` This is a descriptive message only. No action is necessary. With the XD controller, it is possible to generate a monitor with DMPs and run the monitor on a system that has DMVs instead of DMPs. While the DMV physically supports a maximum of 12 lines, any RSTS/E system that was generated with DMPs could exceed this maximum. This error message tells you that the limit was exceeded.

A.2 RT11 Run-Time System Error Messages

The RT11 run-time system can generate the errors described in Tables A–2 and A–3.

Table A–2: Recoverable RT11 Run-Time System Errors

Message and Meaning
`?ADDR?` You specified an illegal address with an E, D, or B command.
`?BAD LOAD?` RT11 encountered an error when reading the program into memory.
`?BAD PPN?` You typed an illegal PPN in response to a LIB or PPN command.
`?BAD START ADDRESS?` The program start address was odd or out of bounds.
`?FIL NOT FND?` The specified file cannot be found.
`?FILE?` You specified no file name or an illegal file name with the R, RUN, or GET command.

(continued on next page)

Table A–2: Recoverable RT11 Run-Time System Errors (Cont.)

Message and Recovery Procedure
?ILL CMD? You typed an illegal command. The command includes an unrecognized command, a syntax error in a command string, a command line longer than 510 characters, or an attempt to change to an illegal size (2 <size> swap max for this job).
?ILL DEV? The command string includes an illegal device name.
?NO RESTART? You typed the RESTART command, but the program cannot be restarted.
?OVR CORE? The program is too large to fit into memory.

Table A–3: RT11 Run-Time System Fatal Execution Errors

Message and Meaning
?M-BPT TRAP The program issued a BPT instruction, but the job has an illegal vector location.
?M-FP TRAP A floating point trap occurred.
?M-HALT The program halted.
?M-ILL EMT The program issued an invalid monitor call.
?M-IOT TRAP The program issued an IOT instruction, but the job has an illegal vector location.
?M-OVLY ERR The RT11 run-time system encountered an error while reading a program overlay. This message may indicate a hardware error.
?PROGRAM LOST - SORRY An unrecoverable error occurred. The run-time system resets user core image.
?M-TOO MANY OPEN CHANNELS The job attempted to open more than 15 channels or attempted to open two DECtape files at once.
?M-TRAP TO 4 The program trapped to the vector at location 4.
?M-TRAP TO 10 The program trapped to the vector at location 10.
?M-TRAP TRAP The job issued the TRAP instruction, but the job has an illegal vector location.

A.3 BATCH Error Messages

During the execution of the batch streams associated with CREATE.SAV and SYSBAT.SAV, two types of errors may occur. The RT11 run-time system returns most errors. The batch program translates these errors to their BASIC–PLUS equivalents and prints the BASIC–PLUS error message text. You can find a discussion of BASIC–PLUS error messages in the *BASIC–PLUS Language Manual.* The batch program itself may generate several other errors. Table A–4 summarizes these errors.

Table A–4: BATCH Error Messages

Message and Meaning
`CREATE NOT RUN FROM DISTRIBUTION MEDIUM` The CREATE program can be run only from the distribution medium.
`DEVICE NOT MOUNTED` The batch stream attempted to dismount a device that was not mounted.
`ERROR CHAINING TO $SYSGEN.SAV` The CREATE program could not find the $SYSGEN.SAV file.
`ERROR DURING PSEUDO KEYBOARD INPUT` An error occurred during input to the pseudo keyboard.
`ERROR DURING PSEUDO KEYBOARD OUTPUT` An error occurred during output to the pseudo keyboard.
`ERROR OPENING OR READING $LOGIN.SAV` The CREATE program could not find the $LOGIN.SAV file on the distribution medium, or an error occurred while reading the file.
`ERROR OPENING OR READING SYSGEN.CTL FILE` The SYSBAT program could not find the SYSGEN.CTL file, or an error occurred while reading the file.
`INVALID CARD` A line contained a command in an incorrect format.
`INVALID SWITCH` A switch used in the command field or in the specification field is undefined or in an incorrect format.
`JOB FAILED TO LOG IN` The job cannot log in because the LOGIN program or the requested account was missing.
`LOGINS HAVE NOT BEEN ENABLED` Logins must be enabled before the batch stream can be processed.
`MOUNT ERROR` The volume to be mounted is not correct (pack IDs do not match) or the device is already in use.
`TOO MANY MOUNTED DEVICES` The job requested the mounting of more than twelve devices.
`TWO MAGTAPE UNITS HAVE THE SAME UNIT NUMBERS TU16/TE16/TU45/TU77` Examine unit switches on magnetic tape drives and ensure that no two have the same unit number.

Device Testing Package (DEVTST) B

The Device Testing Package (DEVTST) exercises hardware on the RSTS/E system during normal time-sharing operations. DEVTST is used to simulate hardware errors on the system.

B.1 Introduction to DEVTST

DEVTST is a package of programs that provides the customer, System Manager, or DIGITAL Field Service personnel with tests that verify the reliability of RSTS/E supported hardware. Execution of any DEVTST program is limited to users with privileged accounts. Operational data, conventions, complete device testing information, and error messages are explained in this chapter. After execution of individual DEVTST exercisers, users should check the System Error Log for additional errors; for more information on the System Error Log refer to the *RSTS/E System Manager's Guide*.

The DEVTST exercisers are tests that can be initiated whenever hardware trouble is suspected. These device exercisers generate excess activity in an attempt to make the hardware fail during operation.

The DEVTST package should be used in conjunction with the RSTS/E error package as described in the *RSTS/E System Manager's Guide*. The Error Logging facility provides the means for determining detailed information on hardware errors. In addition, the DEVTST programs return error messages that may be useful in determining the failure; however, these messages are not as specific as the information provided by the System Error Log.

The following conventions are used throughout the DEVTST package dialogue:

< >	Indicates the default answer.
( )	Shows all possible replies.
[ ]	Gives an optional reply; for example, ASC[II] means enter ASC, ASCI, or ASCII.
ALT MODE or ESC	Either key moves the program back one question. If you type this key as a response to the first question, DEVTST will stop execution and return to the RSTS/E command level.
CTRL/Z	Pressing CTRL/Z causes the program to stop execution and return to RSTS/E command level. CTRL/Z is detected only when the system checks for new input.

CTRL/C	Pressing CTRL/C causes the program to stop execution immediately and return to a command level.
RET	Use the RETURN key to terminate the input line.
Detach <NO>	All of the device exercisers have the ability to detach; this allows you to run an exerciser while keeping your terminal free for other operations.
–1	Negative one, when used as a value for number of iterations, pages, or lines, tells the program to run indefinitely, or until you press CTRL/C.

B.2 DEVTST Operating Procedures

To run a DEVTST program contained within the system library account [1,2], type:

```
RUN $program name
```

For example:

```
RUN $KBEXER
```

To run a DEVTST program from another privileged account, type:

```
RUN [account number]program name
```

where program name is one of the tests in Table B–1. Table B–1 lists the program names and the hardware they test.

For example:

```
RUN [1,215]KBEXER
```

Table B–1: DEVTST Programs

Program Name	Hardware Tested
CPEXER	CPU
CPUTST	CPU
DSKEXR	File-structured disk
DSKSEK	Non-file-structured disk
DTEXER	DECTAPE
DXEXER	Diskette
KBEXER	Terminal
LPEXER	Line printer
MTEXER	Magnetic tape
PPEXER	Paper tape punch
PREXER	Paper tape reader

A complete list of RSTS/E supported hardware, including designators and the associated devices, appears in Table B–2.

Table B–2: RSTS/E Device Designators

Device Designator	Device
DC:, DF:, DS:, DK:, DL:, DM:, DP:, DR:, DB:, DU:, or SY:	RSTS/E public disk structure
SY0:	System disk (the unit that was bootstrapped)
DF0:	RF11 disk (all platters)
DS0: to DS7:	RS03/RS04 fixed-head disk units 0 through 7
DK0: to DK7:	RK05 disk cartridge units 0 through 7
DL0: to DL3:	RL01/RL02 disk cartridge units 0 through 3
DM0: to DM7:	RK06/RK07 disk cartridge units 0 through 7
DP0: to DP7:	RP02/RP03 disk pack units 0 through 7
DR0: to DR7:	RM02/RM03/RM05/RM80 disk units 0 through 7
DB0: to DB7:	RP04/RP05/RP06 disk pack units 0 through 7
DU0: to DU7:	RA60, RA80, RA81, RC25, RD51, RX50 disk units 0 through 7
PR:	High-speed paper tape reader
PP:	High-speed paper tape punch
CR:	CR11 punched or CM11 mark sense card reader
CD:	CD11 punched card reader
MT0: to MT7:	TE10/TU10/TS03 magnetic tape units 0 through 7
MS0: to MS3:	TS11/TSV05/TU80 magnetic tape units 0 through 3
MM0: to MM7:	TE16/TU16/TU45/TU77 magnetic tape units 0 through 7
LP0: to LP7:	Line printer units 0 through 7
DT0: to DT7:	TU56 DECtape units 0 through 7
DD0: to DD7:	TU58 DECtape II units 0 through 7

B.3 DEVTST Dialogue Errors

The following error messages may occur in DEVTST programs:

Message and Meaning

`%Warning: (Device Name) is a logical device: (Device Name) will be used.`

DEVTST determines that the device name given is a logical name for another device. DEVTST performs a logical device translation and the translated device name is used.

`?Illegal device: (Device Name) specified.`

The device name given by the user is either incorrect or a logical device name that cannot be translated (for example, incorrect characters or the wrong type of device). Retry the operation with the correct device name.

(continued on next page)

Message and Meaning
`?Open failure on (Device Name):` (Followed by an error message from Appendix A.) This error message can mean one of the following: 1. The device specified does not exist. 2. No volume was mounted on that device. 3. Another user has assigned the device. 4. The volume on the device has not been formatted. 5. The device is not on-line or the device is not write-enabled. To resolve: retry the operation using the correct option as determined by the error message received.
`?Illegal number of iterations selected.` Retry the operation using the correct number of iterations.

B.4 CPEXER

The central processor exerciser is designed to put a heavy load on the Central Processing Unit (CPU). CPEXER runs compute-bound for short bursts and then sleeps for five seconds so that average processor loading does not appreciably degrade the performance of the system. CPEXER was specifically designed to test the Floating Point Processor (FPP) option, but it also serves to verify general CPU integrity and the PDP–11/40 Extended Instruction Set (EIS) operation. There is also a test of the PEEK function for kernel addresses 0 through 22000.

The tests performed by CPEXER are described in the next section. In most of the tests, results are compared to known correct values. Two heavily compute-bound tests are included to verify consistent results of duplicate calculations. Finally, tests are included that verify FPP divide by zero trap, integer divide by zero trap, integer conversion error, and EIS operation.

B.4.1 CPEXER Tests

There are thirteen CPEXER tests included in the CPEXER program:

`SIN(X)`	Uses SIN(X) extended function
`SIN(X)`	Uses polynomial approximation to SINE function
`LOG(X)`	Uses LOG(X) extended function
`EXP(X)`	Uses EXP(X) extended function
`SQR(X)`	Uses SQR(X) extended function
`SQR(X)`	Uses Newton-Raphson method to determine the square root
`LOG(EXP(X))`	Compute-bound test

(continued on next page)

`ATN(TAN(X))`	Compute-bound test
`A=1.0/0.0`	Verifies FPP divide by zero trap
`A%=1%/0%`	Verifies integer divide by zero trap
`A%=60000`	Verifies integer conversion error
`INT(40.6621*100+0.5)/100= 40.66`	Verifies EIS operation
`PEEK(X)`	Verifies operation of PEEK function

B.4.2 CPEXER Dialogue

The following is an example of the CPEXER dialogue:

```
RUN [1,215]CPEXER
CPEXER V8.0 RSTS V8.0 Time Sharing

How many minutes to run <15>? 1

Detach <No>? N

11.9 seconds of CPU time used in 1 pass.

CPEXER finished at 03:36 PM

Ready
```

Note

The CPEXER program will build correctly only if the version of BASIC–PLUS or BASIC–PLUS–2 includes TRIG and LOG. These mathematical functions must be included during System Generation of BASIC–PLUS or the installation of BASIC–PLUS–2.

B.4.3 CPEXER Errors

This program reports four types of errors:

1. Instructions failed to execute.
2. Errors failed to trap.
3. Computation errors.
4. Computation consistency checks failed.

Check the System Error Log for reported errors. These errors may indicate hardware problems.

When type 1 errors (instruction errors) occur, CPEXER prints a two-line message: the first line gives the test that was being performed and the exact error message, and the second line indicates that the test is continuing. For example:

```
?CPEXER PEEK failed at memory location m.
-(Error Message)

Continuing......
```

where:

(Error Message)	is the RSTS/E error message from Appendix A.
m	is the memory location at which the PEEK function failed.

Examples of type 2 errors (trap failure) are:

```
?CPEXER Floating point divide by 0 didn't trap

Continuing.....

?CPEXER Integer divide by 0 didn't trap

Continuing.....

?CPEXER Forced integer conversion didn't trap

Continuing.....

?CPEXER (INT(40,6621*100=0.5))/100< >40.66

Continuing.....
```

Type 3 errors (computation errors) give the type of test (SIN, PLYNOM, LOG, EXP, SQR, or NEWTON SQR), the error in the computed value, and the location of the possible error. For example:

```
?CPEXER - SIN test failed for the following cases:
?CPEXER - Computed value of SIN( 40 ) was .643 , should be .64
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing ...

?CPEXER - PLYNOM SIN test failed for the following cases:
?CPEXER - Computed value of PLYNOM SIN ( 40 ) was .643, should be .64
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing...

?CPEXER - LOG test failed for the following cases:
?CPEXER - Computed value of LOG ( 140 ) was 4.942 , should be 4.939
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing...

?CPEXER - EXP test failed for the following cases:
?CPEXER - Computed value of EXP ( 4 ) was 54.598 , should be 54.599
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing ...

?CPEXER - SQR test failed for the following cases:
?CPEXER - Computed value of SQR ( 500 ) was 22.361 , should be 22.362
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing...
```

(continued on next page)

```
?CPEXER - NEWTON SQR test failed for the following cases:
?CPEXER - Computed value of NEWTON SQR ( 500 ) was 22.361, should be 22.362
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing...
```

Type 4 errors (consistency failure) in the CPEXER are illustrated by the examples shown below:

```
?CPEXER - EXP/LOG Consistency check failed for the following cases:
?CPEXER - EXP(LOG(...( 1 )))))))))) <> EXP(LOG(...( 1))))))))))
?CPEXER - EXP(LOG(...( 4 )))))))))) <> EXP(LOG(...( 4))))))))))
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing...

?CPEXER - ATN/TAN Consistency check failed for the following cases:
?CPEXER - ATN(TAN(...(-1.5 )))))))))) <> ATN(TAN(...(-1.5 ))))))))))
?CPEXER - CPU,EIS,FIS,FPP,MUL,DIV or SHIFT Error
Continuing...
```

B.5 CPUTST

The CPUTST dialogue first asks how many minutes you want the test to run. The program then checks for expiration of this request time at eight strategic points during each run sequence. CPUTST then clears and/or sets three 2–dimensional arrays to specified values. Matrix A is then transposed and the results placed in Matrix B. The transposition is checked by the statement A(J,I) =B(I,J) while I and J are being varied. Any error is then reported; if none are encountered, the program returns to the matrix clear instruction. The program repeats this process until the run time has expired, at which time it prints the CPU time in seconds of expended job time.

B.5.1 CPUTST Dialogue

The following is an example of CPUTST dialogue:

```
RUN [1,215]CPUTST
CPUTST V8.0 RSTS V8.0 Time Sharing

How many minutes to run <15>? 1

Detach <No>? NO

6.9 seconds of CPU time used.

CPUTST Finished at 10:59 AM

Ready
```

B.5.2 CPUTST Errors

This device exerciser reports errors as shown in the following examples:

```
?CPUTST-Error in matrix transposition routine.

?(Error message) at line mm in CPUTST V8.0.
```

where:

(Error Message)	is the RSTS/E message in the appendix of the *RSTS/E System User's Guide* for the error that occurred.
mm	is the BASIC–PLUS line number in CPUTST where the error occurred.

Check the System Error Log for reported errors. These errors may indicate hardware problems.

If your hardware does not include a floating point processor, submit a Software Performance Report (SPR) to DIGITAL whenever errors appear.

B.6 DSKEXR

This disk exerciser tests the normal operation of all file-structured disks. It is possible to run several copies of DSKEXR in order to test several drives simultaneously or to put a heavier load on any single drive. The disk must be physically and logically mounted. DSKEXR begins by asking questions to determine the disk drive to be tested and the number of test iterations to be performed. After this dialogue, the exerciser opens and extends a temporary file to a predetermined size that is dependent upon disk size and the number of free blocks. A pattern buffer is then loaded with one of four patterns (all 1's and 0's or a pattern of alternating 1's and 0's) and the file is written. Each block is then read and compared for each of the patterns. Upon completion of all iterations for each drive specified, a status report is printed.

Note

This write operation does not use current disk files to read and write. The temporary file will always be deleted after use, regardless of how the DSKEXR program is terminated. Be sure to turn off data caching before you run this test.

B.6.1 DSKEXR Dialogue

The following is an example of DSKEXR dialogue:

```
RUN [1,215]DSKEXR
DSKEXR V8.0 RSTS V8.0 Time Sharing
Disk drive to test? DB1:

Number of test iterations <8>? 1

Detach <No>? NO

No errors detected on _DB1:

Ready
```

B.6.2 DSKEXR Errors

Errors detected by DSKEXR are displayed as shown below:

```
?(Error message) error at line mm in DSKEXR V8.0.

?nn errors detected on DBn.
```

where:

(Error message)	is the RSTS/E message in the appendix of the *RSTS/E System User's Guide* for the error that occurred.
mm	is the line number where the error occurred in the DSKEXR program.
nn	is the number of errors detected by DSKEXR.

When errors are detected, do the following:

1. Ensure that the volume is physically mounted and write-enabled.
2. Ensure that the volume is logically mounted. This may be verified by the use of the $SYSTAT program (see the *RSTS/E System User's Guide*). If the disk is not mounted, use the MOUNT command of the UTILTY program (refer to the *RSTS/E System Manager's Guide*).

Caution

a. Packs mounted as unlocked public disks will be available to other system users for creation and storage of their files. Subsequent removal of a public disk may result in the elimination of these user files from the system. For this reason, DIGITAL recommends the use of a private pack if a non-system disk is to be tested.

b. Never mount a potentially bad disk on another drive until you are sure that the drive and pack are free of physical damage.

3. Persistent errors may be due to bad blocks on the pack. Any potentially bad blocks will be flagged in the System Error Log following unsuccessful access, to prevent further access to the INIT option.

B.7 DSKSEK

This disk exerciser tests the normal operation of non-file-structured disks by randomly reading blocks from the disk. It is possible to run several copies of DSKSEK in order to test several drives simultaneously or to put a heavier load on any single drive. If the disk being tested is a mounted RSTS/E file-structured disk, DSKSEK will not read the known bad blocks. Should an error occur on a read operation, it will be reported by DSKSEK and logged into the System Error Log.

Note

This is a read-only operation. Turn off data caching before you run this test.

B.7.1 DSKSEK Dialogue

The following is an example of DSKSEK dialogue:

```
RUN [1,215] DSKSEK
DSKSEK V8.0 RSTS V8.0 Time Sharing

Disk drive to test? DB0:

Number of test iterations <30>? 1

Detach <No>?

No bad block detections in 1000 sets from _DB0:

Ready
```

B.7.2 DSKSEK Errors

Errors detected by DSKSEK are displayed as follows:

```
?(Error message) error at line mm in DSKSEK V8.0.
```

where:

(Error Message)	is the RSTS/E message in Appendix A of the *RSTS/E System User's Guide.*
mm	is the BASIC–PLUS line number where the error occurred in the DSKSEK program.

When errors are detected, do the following:

1. Check to see if the volume on the testing device is physically mounted.
2. If it is, mount another scratch volume on the drive and retry the operation.

Caution

Never mount a potentially bad disk on another drive until you are sure that the drive and pack are free of physical damage.

3. If the test continues to fail, check the System Error Log to see if bad blocks are recorded.

4. If bad blocks are recorded, add them to the bad block list on the disk using INITs REFRESH BADS suboption. (See the file-related tasks located in the conditional tasks section of this manual for information on BADS.) This can only be done if the disk has been initialized (DSKINTed) as a RSTS/E disk.

5. If the problems continue, get a complete listing of the System Error Log (using the ERRDIS program).

B.8 DTEXER

The DECtape exerciser tests the normal operation of the TC11 DECtape control and TU56 DECtape drives. DTEXER opens a file on the drive being tested and fills the file with floating point numbers. The program writes 420 blocks (of a possible 578 blocks) on the tape. Numbers written on the tape are read and checked, keeping a count of incorrect values. If at the end of the test the error count is not 0, DTEXER prints the error count.

Caution

Any information previously contained on the DECtape used for this test will be destroyed.

B.8.1 DTEXER Dialogue

The following is an example of DTEXER dialogue:

```
RUN [1,10] DTEXER
DTEXER V8.0 RSTS V8.0 Time Sharing

Warning: This exerciser will destroy data on the tested DECtape.

Dectape drive to test? DT1:

Number of iterations <2>? 1

Detach <No>? N
No errors detected on _DT1:

DTEXER Finished at 04:13 PM

Ready
```

B.8.2 DTEXER Errors

This device exerciser shows the number of errors found during operation, as shown in this example:

```
?mm errors on DTn during iteration nn.
```

where:

mm is the number of errors detected by the DTEXER program.

DTn is the name of the device being tested.

nn is the number of the iteration during which the error occurred.

When errors are detected, do the following:

1. Check to see if the DECtape on the testing device is physically mounted and write-enabled.
2. If it is, mount another scratch DECtape on the drive and retry the operation.
3. Ensure that the tape path and heads are free of oxide.

B.9 DXEXER

This exerciser tests the normal operation of the diskette controller and the specified diskette drives. DXEXER starts by opening a file 420 blocks long consisting of floating point numbers. These are written on the drive being tested, then read back and verified. The program then displays the number of words written and read, and the number of errors detected.

Caution

Any information previously contained on the diskette used for this test will be destroyed.

B.9.1 DXEXER Dialogue

The following is an example of DXEXER dialogue:

```
RUN [1,215] DXEXER
DXEXER V8.0 RSTS V8.0 Time Sharing

Warning: This exerciser will destroy data on the tested flexible
diskette.

Flexible drive to test? DX0:

Number of iterations <20>? 2

Detach <No>? NO

Flexible diskette DXEXER I/O data

Device          Reads       Words      Writes       Words
_DX0:           300         76.8 K     300          76.8 K

DXEXER Finished at 10:53 AM

Ready
```

B.9.2 DXEXER Errors

DXEXER shows the number of errors detected during operation as shown below:

```
?mm errors on DXn during iteration nn.
```

where:

mm   is the number of errors detected by the DXEXER program.

DXn   is the name of the device being tested.

nn   is the number of the iteration during which the error occurred.

When errors are detected, do the following:

1. Check to see if the flexible diskette on the testing device is physically mounted and the door closed.
2. If it is, mount another scratch flexible diskette on the drive and retry the operation.

B.10 KBEXER

The keyboard exerciser (KBEXER) is used to test local and remote terminals connected to the RSTS/E system. The three terminal tests are as follows:

1. The Space Test verifies that the terminal carriage will return reliably from any position.
2. The ASCII Pattern Test verifies that the terminal will print the standard ASCII character set in all print positions.
3. The Repeat Test repeats everything typed, one line at a time.

Note

The tests can be terminated at any time by pressing CTRL/C. HELP can be obtained by typing HELP in answer to any dialogue question.

B.10.1 KBEXER Dialogue

The following is an example of KBEXER dialogue:

```
RUN [1,215] KBEXER
KBEXER V8.0 RSTS V8.0 Time Sharing

Keyboard to test <_KB68:>?

Test (SPA[CE], ASC[II], WOR[ST], REP[EAT], HEL[P])? ASC

Number of test iterations <8>? 1

Detach <No>? N
```

```
  *** ROTATING ASCII CHARACTERS TEST ***

#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_ !"#$%&
"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_ !"#$%
!"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_ !"#$
 !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_ !"#
_ !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_ !"
^_ !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_ !
]_ !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
\]^_ !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
[\]^_ !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^
Z[\]^_ !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]
YZ[\]^_ !"#$%&'()*+,-./0123456789:;<=>? @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\
.
.
.
KBEXER Finished at 10:33 AM

Ready
```

B.10.2 KBEXER Errors

Errors detected by KBEXER appear as errors in the keyboard test patterns. Visually check the patterns for errors.

B.11 LPEXER

This exerciser prints a rotating pattern of ASCII characters on a specified number of pages and is used to test any line printer.

B.11.1 LPEXER Dialogue

The following is an example of LPEXER dialogue:

```
RUN [1,215] LPEXER
LPEXER V8.0 RSTS V8.0 Time Sharing

Line printer to test? LP0:

Number of pages to output <4>? 1

Detach <No>? NO

LPEXER finished at 11:38 AM

Ready
```

B.11.2 LPEXER Errors

Problems found on the line printer appear as errors in the print-out of ASCII characters. Visually check the line printer listing and if an error message is printed by LPEXER, check to make sure that the line printer selected is on-line and not out of paper.

B.12 MTEXER

The magnetic tape exerciser checks normal operation of the TM11 or TS11 magnetic tape controller, the RH11/RH70/TM02/TM03 controller, and the specified number of 9–track TE10, TU10, TS03, TS11, TU16, TE16, TU45, or TU77 drives. MTEXER allows you to select the drive to be tested, the length of tape to be written and the number of iterations to be performed. For each iteration, MTEXER initializes the tape, opens a file and writes data until the specified length of tape has been used. MTEXER then rewinds the tape, opens the file for input, reads and verifies the data. If errors are detected, MTEXER prints a count of the number of bytes found to be incorrect; MTEXER then proceeds to the next iteration.

The data pattern used is a worst case NRZI pattern for 9–track drives. The pattern is loaded into a 512–byte buffer, and successively greater numbers of records are written to the magtape until the requested length of tape has been written. Furthermore, the pattern base varies with X so that the contents of the pattern buffer also varies on successive iterations.

Caution

This exerciser will overwrite data contained on the magnetic tape used for the test.

B.12.1 MTEXER Dialogue

The following is an example of MTEXER dialogue:

```
RUN [1,10]MTEXER
MTEXER V8.0 RSTS V8.0 Time Sharing

Warning: This exerciser will destroy data on the tested magtape.

Magtape drive to test? MT2:

Density (800 or 1600) <800>?

Number of feet to test <100>?

Number of iterations <2>? 1

Detach <No>? N

Magtape MTEXER I/O Data

Device          Reads         Words      Writes       Words
_MT2:           387           99.072 K   387          99.072 K

No errors detected on _MT2:

Ready
```

B.12.2 MTEXER Errors

Magtape errors are reported in these formats:

```
?Magtape select error at line nn in MTEXER V8.0-06.

?MTEXER-Selection error occurred.
```

where:

nn is the line number in MTEXER at which the error occurred.

When errors are detected, do the following:

1. Check to see if the volume on the testing device is physically mounted, write-enabled, and assigned to you.
2. If it is, mount another scratch volume on the drive and retry the operation.
3. Ensure that the tape path and heads are free of oxide.

B.13 PPEXER

This program tests the normal operation of the paper tape punch by punching random patterns on the paper tape for input into the PREXER.

B.13.1 PPEXER Dialogue

The following is an example of PPEXER dialogue:

```
RUN [1,215] PPEXER
PPEXER V8.0 RSTS V8.0 Time Sharing

This test will punch a binary count pattern tape.
The tape will be equivalent to MAINDEC-00-D2G4 entitled
Special Binary Count Pattern Tape.

Detach <No>?

The generated paper tape may be used to test the paper tape
reader.

PPEXER finished at 11:23 AM

Ready
```

B.13.2 PPEXER Errors

Problems in the paper tape punch will result in an incorrectly generated paper tape, which is detected by PREXER when the tape is read. If PPEXER prints an error message, check to see that the paper tape punch is on-line and not out of paper tape.

B.14 PREXER

This program tests the normal operation of the paper tape reader by reading the paper tape punched by the PPEXER program.

B.14.1 PREXER Dialogue

The following is an example of PREXER dialogue:

```
RUN [1,215] PREXER
PREXER V8.0 RSTS V8.0 Time Sharing

Load MAINDEC-00-D2G4-PT or the binary count pattern
tape generated by the punch exerciser into the reader
with the leader under the read station.

Detach <No>? NO
No errors detected on paper tape.

PREXER finished at 11:29 AM

Ready
```

B.14.2 PREXER Errors

PREXER errors are reported in this format:

```
?nn errors detected on paper tape
```

where:

nn is the number of errors detected by the PREXER program.

Note

If the paper tape was loaded backwards and the reader is operating correctly, the following error message is printed: ?15360 errors detected on paper tape.

Any other errors detected by the PREXER may indicate a hardware problem.

Address and Vector Assignments

C

The RSTS/E system initialization code performs a hardware configuration check each time the system disk (or distribution medium) is bootstrapped. In the absence of any information to the contrary, the initialization code assumes that all devices attached to the UNIBUS have been assigned addresses according to the manufacturing standards. The initialization code determines interrupt vectors automatically by forcing each supported device to interrupt. Although the HARDWR initialization option allows you to declare nonstandard address and vector assignments, DIGITAL recommends that the standard configuration rules be followed whenever possible.

Several devices have floating addresses. This means that the presence or absence of any floating address device will affect the assignment of addresses to other floating address devices. Similarly, many devices have floating vectors. According to the standard, interrupt vectors must be assigned in a specific sequence and the presence of one type of device will affect the correct assignment of interrupt vectors for other devices. Finally, there are many options that have fixed addresses and vectors. This appendix presents the algorithms for assignment of floating addresses and vectors. It also lists the fixed assignments for devices supported by RSTS/E.

C.1 Floating Addresses

Currently the floating address devices include the devices listed in Table C–1. The following ground rules apply to these devices and future floating address devices:

1. Only new devices will be assigned floating addresses. Devices now in production will keep their old addresses.
2. Future devices may float both their address and interrupt vectors.
3. The floating address space starts at 760010(8) and proceeds upward to 764000(8).
4. A gap in the address space (no SLAVE SYNC) implies that a device does not exist.

5. The first address of a new device type will always be on a 2^N word boundary, where N is the first integer greater than or equal to LOG2 M and M is the number of device registers.

Number of Registers in Device	**Possible Boundaries**
1	Any Word
2	XXXXX0,XXXXX4
3,4	XXXXX0
5,6,7,8	XXXX00,XXXX20,XXXX40,XXXX60
9 thru 16	XXXX00,XXXX40

6. A "gap" of at least one word will be left after each type of device, starting on the same boundary the device would start on. Note that the gap must be at least one word in length but may be longer than one word. Gap length is determined by the boundary on which the next must be addressed contiguously.

Address 760010 is reserved for the first DJ11. Since the DJ11 has four registers, additional DJ11s are assigned addresses modulo 10 (base 8) immediately following the first DJ11 (for example, 760010, 760020, and so forth). The modulo 10 (base 8) address following the last DJ11 is left empty and is known as the DJ11 gap. If there are no DJ11s, the gap is at 760010. If there is one DJ11, the gap will be at 760020. All gaps must be at least one word in length.

After all DJ11 addresses and the DJ11 gap are defined, the address for the first DH11 can be assigned. DH11s have eight registers, which implies a modulo 20 (base 8) boundary. The address of the first DH11 is the first modulo 20 address following the DJ11 gap. If there are no DJ11s (DJ11 gap at 760010), the first DH11 is assigned address 760020. Similarly, if there is one DJ11, the DJ11 gap will begin at 760020 and the next available modulo 20 boundary is 760040. All additional DH11s are assigned addresses modulo 20 immediately after the first DH11. The DH11 gap begins on the module 20 boundary following the last DH11.

After all DH11 addresses and the DH11 gap are defined, DQ11, DU11, DUP11, LK11, DMC11, DZ11, and KMC11 through DMV11–AD addresses and the required gaps can be assigned in sequence by their rank. Addresses for any future floating address devices will be assigned in a similar manner.

Floating Address Worksheet

The algorithm for assignment of floating addresses is confusing for a configuration that consists of several types of floating address devices. The floating address worksheet is a graphic aid that allows you to assign floating addresses to a device quickly, without referring to the formal rules.

The floating address worksheet consists of 26 columns. The first column contains the floating addresses, from 760010 to 762000. The worksheet continues on for four pages to accommodate all of the addresses. Note that the last address on the worksheet also appears as the first address of the worksheet on the following page. For example, the last address of the first worksheet is 760400. The first address of the worksheet on the next page is 760400. This allows you to carry over the information from the previous page.

Note

The floating address area continues to address 764000. If your configuration continues to this address, you can create an addition to the worksheet by adding 2000 to the last address listed on the worksheet, which is 762000.

Columns 2 through 25 contain the floating address device names. To the right of the worksheet is a List of Devices. Here you can enter the number of devices in your configuration. Below the List of Devices is a Record of Floating Addresses. Here you can record the device, the unit number, and the floating address.

Here's how to use the worksheet:

1. In the spaces provided in the List of Devices, record the quantity of each type of floating address device in your configuration. For example, if you have two DJ11 and two DH11 devices, enter 2 in the spaces provided adjacent to the DJ11 and the DH11 in the List of Devices.

2. Begin at address 760010 of the worksheet under the DJ11 column and record the unit number for all DJ11s in your configuration. Begin with unit 0 and end with unit n–1, where n represents the number of DJ11s in your configuration. For example, if you have two DJ11 devices, enter a device unit of 0 in the unshaded box to the right of address 760010. Enter a device unit of 1 in the unshaded box to the right of address 760020. Use only the unshaded boxes when you enter the device unit number. The shaded boxes represent illegal addresses for a particular device unit.

   Note

   Where you begin in the worksheet depends upon what devices you have in your configuration. Suppose you have LPP11 and DWR70 devices. In this case you would start at address 760130 under the first unshaded box under the LPP11 column.

   ---

3. Immediately below the last device unit, mark an X for the required address gap. For example, the last DJ11 unit in the previous example is at address 760020. You would mark an X in the unshaded box to the right of address 760030. Use only the unshaded boxes when you mark the address gap. The shaded boxes also indicate an illegal address gap.

4. To the immediate right of the address gap, mark a Y. For example, you would enter Y in the shaded box to the right of the X at address 760300. When you mark a Y to the right of an address gap, use either the shaded or the unshaded boxes, depending on which is to the right of the address gap. If there are no units of a particular device type, enter an X to indicate the gap addresses; then enter a Y to the right of this. For example, if you have no DJ11 devices, you mark an X in the unshaded box to the right of address 760010. You would then mark a Y to the right of this. The Y is a marker that tells you which address to start at for the next device.

5. Continue below the Y in the previous column and enter the unit number of the next device in your configuration. Start with unit 0 and continue to unit n–1.* Skip the shaded boxes in numbering down the column. In the first unshaded box below the last DH11 unit, mark an X for the DH11 gap. Then mark a Y to the right of the address gap.

6. Continue with the remaining floating address devices. In each case, number the units from 0 to n–1 down the column, beginning in the first unshaded box below the X. Mark an X in the next unshaded box below the last unit and a Y in the box immediately to the right of the last unit.

7. After you complete the worksheet, you can record the device, the unit number, and its associated floating address in the spaces provided in the Record of Floating Addresses.

* The first MSCP controller has a fixed address. This means you should fill in floating addresses starting with controller 1, not controller 0.

DEVICE

ADDRESS	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	DZ11*	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	Rsrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50
760000																										
760004																										
760010																										
760014																										
760020																										
760024																										
760030																										
760034																										
760040																										
760044																										
760050																										
760054																										
760060																										
760064																										
760070																										
760074																										
760100																										
760104																										
760110																										
760114																										
760120																										
760124																										
760130																										
760134																										
760140																										
760144																										
760150																										
760154																										
760160																										
760164																										
760170																										
760174																										
760200																										
760204																										
760210																										
760214																										
760220																										
760224																										
760230																										
760234																										
760240																										
760244																										
760250																										
760254																										
760260																										
760264																										
760270																										
760274																										
760300																										
760304																										
760310																										
760314																										
760320																										
760324																										
760330																										
760334																										
760340																										
760344																										
760350																										
760354																										
760360																										
760364																										
760370																										
760374																										
760400																										
	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	DZ11*	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	Rsrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50

LIST OF DEVICES

DJ11		KMC11		DR11-W	
DH11		LPP11		DR11-B	
DQ11		VMV21		DMP11	
DU11		VMV31		DPV11	
DUP11		DWR70		ISB11	
LK11		RL11		DMV11	
DMC11		KW11		UNA	
DZ11/DZV11		RX11		UDA50	

RECORD OF FLOATING ADDRESSES

DEVICE	UNIT	ADDRESS

DEVICE	UNIT	ADDRESS

* Use this column to figure out the floating address assignments for either the DZ11 or the DZV11 multiplexer, whichever one is on your system.

DEVICE

ADDRESS	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	*DZ11	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	RSrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50
760400																										
760404																										
760410																										
760414																										
760420																										
760424																										
760430																										
760434																										
760440																										
760444																										
760450																										
760454																										
760460																										
760464																										
760470																										
760474																										
760500																										
760504																										
760510																										
760514																										
760520																										
760524																										
760530																										
760534																										
760540																										
760544																										
760550																										
760554																										
760560																										
760564																										
760570																										
760574																										
760600																										
760604																										
760610																										
760614																										
760620																										
760624																										
760630																										
760634																										
760640																										
760644																										
760650																										
760654																										
760660																										
760664																										
760670																										
760674																										
760700																										
760704																										
760710																										
760714																										
760720																										
760724																										
760730																										
760734																										
760740																										
760744																										
760750																										
760754																										
760760																										
760764																										
760770																										
760774																										
761000																										
	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	*DZ11	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	RSrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50

RECORD OF FLOATING ADDRESSES

DEVICE	UNIT	ADDRESS

DEVICE	UNIT	ADDRESS

* Use this column to figure out the floating address assignments for either the DZ11 or the DZV11 multiplexer, whichever one is on your system.

DEVICE

ADDRESS	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	DZ11*	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	Rsrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50
761000																										
761004																										
761010																										
761014																										
761020																										
761024																										
761030																										
761034																										
761040																										
761044																										
761050																										
761054																										
761060																										
761064																										
761070																										
761074																										
761100																										
761104																										
761110																										
761114																										
761120																										
761124																										
761130																										
761134																										
761140																										
761144																										
761150																										
761154																										
761160																										
761164																										
761170																										
761174																										
761200																										
761204																										
761210																										
761214																										
761220																										
761224																										
761230																										
761234																										
761240																										
761244																										
761250																										
761254																										
761260																										
761264																										
761270																										
761274																										
761300																										
761304																										
761310																										
761314																										
761320																										
761324																										
761330																										
761334																										
761340																										
761344																										
761350																										
761354																										
761361																										
761364																										
761370																										
761374																										
761400																										
	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	DZ11*	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	Rsrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50

RECORD OF FLOATING ADDRESSES

DEVICE	UNIT	ADDRESS

DEVICE	UNIT	ADDRESS

* Use this column to figure out the floating address assignments for either the DZ11 or the DZV11 multiplexer, whichever one is on your system.

DEVICE

ADDRESS	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	*DZ11	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	Rsrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50
761400																										
761404																										
761410																										
761414																										
761420																										
761424																										
761430																										
761434																										
761440																										
761444																										
761450																										
761454																										
761460																										
761464																										
761470																										
761474																										
761500																										
761504																										
761510																										
761514																										
761520																										
761524																										
761530																										
761534																										
761540																										
761544																										
761550																										
761554																										
761560																										
761564																										
761570																										
761574																										
761600																										
761604																										
761610																										
761614																										
761620																										
761624																										
761630																										
761634																										
761640																										
761644																										
761650																										
761654																										
761660																										
761664																										
761670																										
761674																										
761700																										
761704																										
761710																										
761714																										
761720																										
761724																										
761730																										
761734																										
761740																										
761744																										
761750																										
761754																										
761761																										
761764																										
761770																										
761774																										
762000																										
	DJ11	DH11	DQ11	DU11	DUP11	LK11	DMC11	DZ11	KMC11	LPP11	VMV21	VMV31	DWR70	RL11	LPA11	KW11	Rsrvd	RX11	DR11W	DR11B	DMP11	DPV11	ISB11	DMV11	UNA	UDA50

RECORD OF FLOATING ADDRESSES

DEVICE	UNIT	ADDRESS

DEVICE	UNIT	ADDRESS

* Use this column to figure out the floating address assignments for either the DZ11 or the DZV11 multiplexer, whichever one is on your system.

C.2 Floating Vectors

Many devices have floating vectors. The vector assignment sequence is normally the same sequence as that in which the devices enter production. A vector for a new hardware option is not inserted before the vector for a device that is already in production. Gaps in the vector assignments are not required. The floating vectors begin at address 300 and proceed continuously upwards. The vector assignment sequence for current devices is defined below.

Table C–1: Device Vector Assignments

Device	First Address	Next Addr.	Vector Size	Max# Units	BR Level	RSTS/E Notes
DC11	174000	+10	10	32	BR5	Not Supported
DL11A,B	176500	+10	10	16	BR4	Non–Console
DP11	174770	–10	10	32	BR5	2780 Only***
DM11A	175000	+10	10	16	BR5	Not Supported
DN11	175200	+10	4	16	BR5	Not Supported
DM11BB	170500	+10	4	16	BR4	DH11 modem control
DR11A,C	167770	–10	10*	32	BR5	Not Supported
PA611 Reader	172600	+4	4*	16	BR4	Not Supported
PA611 Punch	172700	+4	4*	16	BR4	Not Supported
LPD11			10			Not Supported
DT11 (DT03_FP)	174200	+2	10*	8	BR7	Not Supported
DX11	176200	+40	10*	4	BR4	Not Supported
DL11C,D,E	175610	+10	10*	31	BR4	
DJ11	FLOAT	+10	10*	16	BR5	
DH11	FLOAT	+20	10*	16	BR5	
GT40	172000		20*		BR5	Not Supported
VSV11	172000	+10	20			Not Supported
LPS11	170400	+40	30*	14	BR5,6	Not Supported
DQ11	FLOAT	+10	10*	16	BR5	Not Supported
KW11W	172400	NA	10*	1		Not Supported
DU11	FLOAT	+10	10*	16	BR5	2780 Only***
DUP11	FLOAT	+10	10*	16	BR5	2780 Only***
DV11	175000	+40	20*	4	BR5,6	Not Supported

(continued on next page)

Table C–1: Device Vector Assignments (Cont.)

Device	First Address	Next Addr.	Vector Size	Max# Units	BR Level	RSTS/E Notes
LK11	FLOAT	+10	10*	1	BR4	Not Supported
DWVN			10			Not Supported
DMC11	FLOAT	+10	10*	16	BR5	DECnet/E Only**
DMR11	FLOAT	+10	10	16	BR5	DECnet/E Only**
DZ11	FLOAT	+10	10*	8	BR5	
DZV11	FLOAT	+10	10*	4	BR5	
KMC11	FLOAT	+10	10*	16	BR5	
LPP11	FLOAT	+10	10			Not Supported
VMV21	FLOAT	+10	10			Not Supported
VMV31	FLOAT	+20	10			Not Supported
VTV01	172600		10	2		Not Supported
DWR70	FLOAT	+10	10			Not Supported
RL11	FLOAT	+10	4		BR5	After 1st
TS11	172520	+4	4	4	BR5	2nd, 3rd, and 4th Units Not Supported
LPA11–K	170460		10	1		
IP11	171000		4	2		Not Supported
KW11–C	FLOAT	+10				Not Supported
RX11	FLOAT	+10	4	1	BR5	After 1st Only
DR11–W	FLOAT	+10	4			Not Supported
DR11–B	FLOAT	+10	4			Not Supported
DMP11	FLOAT	+10	10	16	BR5	DECnet/E Only
DPV11	FLOAT	+10	10		BR5	Not Supported
ML11	176400		4	1		Not Supported
ISB11	FLOAT	+10	10			Not Supported
DMV11	FLOAT	+20	10	16	BR5	DECnet/E Only

* The first vector for the first device of this type must always be on a 10(8) boundary.

** RSTS/E and DECnet/E limit the combined maximum number of DMCs and DMRs to 16.

*** Also supported at BR6 under RSTS/2780.

C.3 Fixed Addresses and Vectors

The following table lists the devices supported under RSTS/E that have fixed addresses and vectors.

Table C–2: Devices with Fixed Addresses and Vectors

Device	Address	Vector	BR Level	RSTS/E Notes
MSCP*	172150	——	BR5	1st Unit Only
RF11	177460	204	BR5	Up to 8 Platters
RS03/RS04	172040	204	BR5	Up to 8 Drives
RK05/RK05F**	177400	220	BR5	Up to 8 Drives
RL01/RL02	174400	160	BR5	Up to 4 Drives
RK06/RK07	177440	210	BR5	Up to 8 Drives
RP02/RP03	176710	254	BR5	Up to 8 Drives
RM02/RM03/RM05/RM80	176300	150	BR5	Up to 8 Drives
RP04/RP05/RP06	176700	254	BR5	Up to 8 Drives
RX01/RX02	177170	264	BR5	Up to 8 Drives
DECtape	177340	214	BR6	Up to 8 Drives
TU10/TE10/TS03/TS11	172520	224	BR5	First Drive Only
TU16/TE16/TU45/TU77	172440	224	BR5	Up to 8 Drives
LP11 (LP0)	177514	200	BR4	Depending on Speed
(LP1)	164004	170	BR4	
(LP2)	164014	174	BR4	
(LP3)	164024	270	BR4	
(LP4)	164034	274	BR4	
(LP5)	164044	774	BR4	
(LP6)	164054	770	BR4	
(LP7)	164064	764	BR4	
CR11,CM11	177160	230	BR5	
CD11	177160	230	BR4	
KW11L	177546	100	BR6	
KW11P	172540	104	BR6	
KG11	170700	NONE	NONE	2780 Only
DL11A,DL11B	177560	60	BR4	Console Interface

* MSCP controllers have programmable vectors; INIT.SYS finds an available vector address and assigns it to each MSCP controller.

** Each RK05F must be counted as two drives.

C.4 RH70 BAE and CS3 Addresses

The following table lists the four possible RH70 High Speed I/O Controller addresses, their Bus Address Extension (BAE) and Control addresses, their BAE Control Status 3 (CS3) addresses, and their uses.

Table C–3: RH70 BAE and CS3 Addresses

Device	Address	BAE	CS3
RS03/RS04 only	172040	172070	172072
TU16/TE16/TU45/TU77	172440	172474	172476
Mixed/nonstandard	176300	176350	176352
RP04/RP05/RP06 or RM02/RM03/RM05/RM80	176700	176750	176752

RSTS/E System Library Control Files D

The RSTS/E distribution kit contains control files. Table D–1 summarizes the function of each. Because all RSTS/E systems require the standard system library, you must run the BUILD program using the BUILD.CTL file. Build the other libraries only if you plan to include their optional features on your system.

Table D–1: Control Files for the BUILD Program

File	Function
BUILD.CTL	Builds and patches the standard system library programs required for all systems
SPLER.CTL	Builds files for the Standard RSTS/E spooling package
SPL.CTL	Builds files for the Micro–RSTS spooling package
BIGPRG.CTL	Builds files for certain large programs
BACKUP.CTL	Builds files for the BACKUP Package library
DEVTST.CTL	Builds the Device Testing Package
DCL.CTL	Builds DCL
HELP.CTL	Builds the HELP package

D.1 BUILD.CTL File

Commands in the BUILD.CTL control file create a standard system library for all systems. Table D–2 lists and describes the programs and files contained in the standard library. Table D–2 also includes manual references which tell you where to find more detailed descriptions of each program and file. The references in Table D–2 refer to the *RSTS/E System User's Guide (SUG)*, the *RSTS/E System Manager's Guide (SMG)*, the *RSTS/E Maintenance Notebook (MNB)*, or the *RSTS/E System Generation Manual (SGM)*.

Table D–2: BUILD.CTL Programs and Files

Program or File Name	Protection	Description	Manual Reference
CPATCH.BAC	<124>	Creates system library patching command files	SMG
AUTOED.BAC	<124>	Editor for system library patching	SMG
ATPK.BAC	<232>	Processes command files	MNB
LOGIN.BAC	<232>	Logs users into the system	SUG
LOGOUT.BAC	<232>	Logs users out of the system	SUG
PATCPY.BAC	<124>	Copies patch files	SMG
PBUILD.BAC	<124>	Builds system library patching files	SMG
UTILTY.BAC	<124>	Performs system utility routines	SMG
INIT.BAC	<124>	Initializes system at start of time sharing	SMG
SHUTUP.BAC	<124>	Performs system shutdown	SMG
ERRBLD.BAC	<124>	Builds error data file for use by ERRDIS package	SMG
ERRINT.BAC	<124>	Validates or initializes ERRLOG.FIL	SMG
ERRCPY.BAC	<124>	Copies hardware error data to a disk file	SMG
ERRDIS Package	<124>	Produces reports	SMG
DIRECT.BAC	<232>	Lists device directories	SUG
TTYSET.BAC	<232>	Sets terminal characteristics	SMG SUG
SYSTAT.BAC	<232>	Reports system status	SMG SUG
BUILD.BAC	<124>	Builds and patches system library control files and optional and bundled software	SGM
ANALYS Package	<124>	Analyzes system crash information and retrieves error data	SMG
ODT.BAC	<124>	Octal debugging tool	SMG
REACT.BAC	<124>	Creates user accounts	SMG
REORDR.BAC	<124>	Restructures user file directories for optimal performance	SMG
DSKINT.TSK	<124>	Initializes formatted disks	SMG
UMOUNT.BAC	<232>	Mounts and dismounts private disks and tapes	SUG
COPY.BAC	<104>	Copies entire tapes and disks	SUG
FILCOM.BAC	<104>	Compares ASCII files	SUG
MONEY.BAC	<104>	Performs system accounting functions	SMG SUG

(continued on next page)

Table D–2: BUILD.CTL Programs and Files (Cont.)

Program or File Name	Protection	Description	Manual Reference
GRIPE.BAC	<232>	Records user comments	SMG SUG
TALK.BAC	<232>	Provides interterminal communications	SMG
PLEASE.BAC	<232>	Prints requests at terminal and interacts with OPSER package	SMG
SWITCH.BAC	<232>	Changes the job keyboard monitor	SUG
NOTICE.TXT	<40>	Sample system notices text file	SUG
HELP.HLP	<40>	System help message text file	SUG
RTS.CMD	<60>	Sample indirect command file for adding auxiliary run-time systems	SMG
TTY.CMD	<60>	Sample indirect command file for setting terminal characteristics	SMG
CCL.CMD	<60>	Sample indirect command file for defining CCL commands	SMG
START.CTL	<60>	Sample system start-up control file	SMG
CRASH.CTL	<60>	Sample system crash recovery control file	SMG
ANALYS.CMD	<60>	Sample indirect command file for crash analysis	SMG
CLEAN.CMD	<60>	Sample indirect command file for cleaning disks	SUG
UTILTY.HLP	<60>	UTILTY program help message file	SMG
DIRECT.HLP	<40>	DIRECT program help message file	SUG
ERRDIS.HLP	<60>	Error display program help file	SMG
ACCT.SYS	<188>	Sample system accounts file	SMG
COPY.HLP	<40>	COPY program help message file	SUG
MAKSIL.BAC	<124>	Generates a Save Image Library from a Task Image File	PUM

D.2 SPLER.CTL File

Commands in the SPLER.CTL control file create programs and files for the Standard RSTS/E Spooling Package. Table D–3 contains the name, the protection code, and a brief description of each of these programs and files. Use the manual references in Table D–3 for a more detailed explanation of each component in the Standard RSTS/E Spooling Package. The references direct you to either the *RSTS/E System User's Guide (SUG)*, the *RSTS/E System Manager's Guide (SMG)*, or the *RSTS/E Maintenance Notebook (MNB)*.

Table D–3: SPLER.CTL Programs and Files

Program or File Name	Protection	Description	Manual Reference
OPSER Package	<124>	Operator services package	SMG
CHARS.BAC	<124>	Creates the character generation file, CHARS.QUE	SMG
QUE.BAC	<232>	Creates requests for spooling programs	SUG
QUE Management Package	<124>	Queue management package	SMG
SPOOL.CMD	<60>	Sample command file for starting up spooling programs	SMG
BATDCD.BAC	<124>	Creates BATCH program command decoding file BATCH.DCD	SMG
SPOOL Package	<124>	Line printer spooling package	SMG
BATCH Package	<124>	Batch spooling package	SMG SUG

D.3 SPL.CTL File

Commands in the SPL.CTL control file create programs and files for the Micro–RSTS Spooling Package. Table D–4 contains the name and description of each of these programs and files.

Table D–4: SPL.CTL Programs and Files

Program or File Name	Description	Location
SPL.TSK	Spooling Package Program	[1,2]
QUEUE.TSK	Interface Program	[1,2]
FORMS.SYS	Forms Definition File used by QUEUE.TSK	[1,2]
RMSERR.ERR	RMS error text file used by SPL.TSK	LB:

D.4 BIGPRG.CTL File

Commands in the BIGPRG.CTL control file create programs that are used with certain peripheral devices and optional software. Table D–5 contains the name, the protection code, and a brief description of each program in the BIGPRG command file. In addition, Table D–5 contains a manual reference that you can use to find a more detailed description of each program. The references direct you to the *RSTS/E System User's Guide (SUG)*, the *RSTS/E Programmer's Utilities Manual (PUM)*, the *RSTS/E System Manager's Guide (SMG)*, or the *BASIC–PLUS Language Manual (BPLM)*.

Table D–5: BIGPRG.CTL Programs and Files

Program or File Name	Protection	Description	Manual Reference
VT50PY.BAC	<232>	Status display program for VT50, VT52, and VT100. Created from DISPLY and VT50.DPY.	SMG
FIT.BAC	<232>	Transfers files to and from diskettes, DECtape IIs, and RT11–formatted disks.	SUG
FLINT.BAC	<104>	Copies files between IBM compatible diskettes and RSTS/E disks.	SUG
PMDUMP.BAC	<104>	Provides post-mortem dump of low memory and user job area.	SUG
BPCREF Package	<104>	Creates cross-reference listing for BASIC–PLUS programs.	BPLM
RUNOFF.BAC	<104>	Formats documents, memos, reports, and so forth.	

D.5 BACKUP.CTL File

Commands in the BACKUP.CTL control file create programs for the BACKUP Package. Table D–6 describes the contents of this package. You can find a more detailed description of the BACKUP Package in the *RSTS/E System Manager's Guide (SMG)*.

Table D–6: BACKUP.CTL Programs and Files

Program or File Name	Protection	Description	Manual Reference
BACKUP Package	<232>	Transfers information from disk to tape or disk and restores the information to the original volume. The package contains 15 programs, two of which do not have a protection code of <232>. BACENT.BAC and BACPRM.BAC have protection codes of <124>.	SMG
BACDSK.BAC	<232>	Writes BACKUP file structure on disks.	SMG

D.6 DEVTST.CTL File

Commands in the DEVTST.CTL control file create executable programs for the Device Testing Package. Table D–7 contains a description of each program in this package. (See Appendix B for a complete description of the DEVTST programs.)

Table D–7: DEVTST.CTL Programs

Program or File Name	Protection	Description
DSKSEK.BAC	<124>	Tests the normal operation of non-file-structured disk controllers
DSKEXR.BAC	<124>	Tests the normal operation of all file-structured disks
LPEXER.BAC	<124>	Test prints a rotating pattern of ASCII characters and specified number of pages and tests any line printer
PPEXER.BAC	<124>	Tests the normal operation of the paper tape punch by punching random patterns on the paper tape for input into the PREXER
PREXER.BAC	<124>	Tests the normal operation of the paper tape reader
DXEXER.BAC	<124>	Tests the normal operation of the diskette controller
DDEXER.BAC	<124>	Tests the normal operation of the DECtape controller and drives
CPEXER.BAC	<124>	Tests the CPU to verify that it is performing properly
CPUTST.BAC	<124>	Tests the integrity of CPU addresses
KBEXER.BAC	<124>	Tests terminals
MTEXER.BAC	<124>	Checks the normal operation of magnetic tape controllers and drives

D.7 DCL.CTL Control File

The DCL run-time system consists of two files: the DCL run-time system file (DCL.RTS) and the DCL executable file (DCL.DCL). When you process the DCL.CTL control file, BUILD copies DCL.RTS and DCL.DCL to account [0,1] on the system disk.

The DCL run-time system uses certain system programs to carry out the DCL commands. Some of the system programs are built in Phase 8 of system generation (for example, PLEASE and QUE, which are system programs associated with the SPLER.CTL control file). Other system programs used by DCL are built when you build the appropriate optional software. For example, the NET.TSK and NFT.TSK system programs will be built if you install DECnet/E. The BUILD program automatically copies the system programs used by DCL to one of the following accounts on the system disk during the appropriate installation procedure:

- [0,1]
- [1,2]
- LB:

Do not move any of these system programs to other accounts; otherwise, the DCL run-time system will not be able to find them and will display the message: ?Command not available.

Table D–8 lists the DCL commands and their associated system programs. Note the account number in the program column of the table. The system program must reside in this account for DCL to work. The asterisk (*) after the program name indicates that DCL uses any executable file type.

Note

The files used by the LINK command are not included in this table. For more information on the LINK command, refer to the *RSTS/E Maintenance Notebook*, Sequence 20.1.3. The maintenance notebook also describes some feature patches for DCL. These patches allow you to change some defaults in order to improve your system's response time. All articles on DCL have sequence numbers of the form 20.x.y.

Table D–8: DCL Commands and Their Associated System Programs

Command	Program	Installation
COBOL	[1,2]C81.TSK	COBOL–81 Installation
All commands	[0,1]DCL.DCL	RSTS/E DCL Installation
All commands	[0,1]DCL.RTS	RSTS/E DCL Installation
HELP	[1,2]DCL.HLP	RSTS/E HELP Package Installation
DIBOL	[1,2]DICOMP.TSK	RSTS/E DIBOL Installation
EDIT	[1,2]EDT.TSK	EDT Installation
DIFFERENCES	[1,2]FILCOM.*	RSTS/E Standard CUSP Build
FORTRAN/FOR	[1,2]FORTRAN.SAV	FORTRAN IV Installation
FORTRAN/F77	[1,2]F77.TSK	FORTRAN 77 Installation
HELP	[1,2]HELP.*	RSTS/E HELP Package
LOGOUT	[1,2]LOGOUT.*	RSTS/E Standard CUSP Build
MACRO/RT11	[1,2]MACRO.SAV	RSTS/E System Generation
MACRO/RSX	[1,2]MAC.TSK	RSTS/E RSX Package
SHOW NETWORK	[1,2]NCP.TSK	DECnet/E Installation
SET HOST	[1,2]NET.TSK	DECnet/E Installation
APPEND, COPY, DELETE, DIRECTORY, RENAME, TYPE	[1,2]NFT.TSK	DECnet/E Installation
APPEND, COPY, CREATE, DELETE, DIRECTORY, INITIALIZE	[1,2]PIP.SAV	RSTS/E System Generation
REQUEST	[1,2]PLEASE.*	RSTS/E Standard Spooling Package Installation
DELETE/ENTRY, DELETE/JOB, PRINT, SUBMIT, SET QUEUE/ENTRY, SET QUEUE/JOB, SHOW QUE	[1,2]QUE.*	RSTS/E Standard Spooling Package Installation

(continued on next page)

Table D–8: DCL Commands and Their Associated System Programs (Cont.)

Command	Program	Installation
DELETE/ENTRY, DELETE/JOB, PRINT, SHOW QUE	[1,2]QUEUE.TSK	Micro–RSTS Spooling Package Installation
SHOW TERMINAL	[1,2]SHOTER.*	RSTS/E DCL Installation
BASIC	[1,2]SWITCH.*	RSTS/E Standard CUSP Build
SHOW DEVICES, SHOW USERS, SHOW SYSTEM	[1,2]SYSTAT.*	RSTS/E Standard CUSP Build
SET TERMINAL	[1,2]TTYSET.*	RSTS/E Standard Build
MOUNT, DISMOUNT	ONLCLN	RSTS/E System Generation
MOUNT, DISMOUNT, INITIALIZE	[1,2]DCLUTL.*	RSTS/E DCL Installation

Bootstrapping the Distribution Medium

E

The distribution medium is the tape or disk on which DIGITAL supplies the RSTS/E system. To bootstrap the distribution medium, use the switches on the Central Processing Unit (CPU) or type a command to the console emulator to activate a hardware loader that contains machine instructions for reading the first record of the distribution medium into memory. This record, called a bootstrap record, is a program that loads additional program code from the distribution medium into memory and executes that code. The code then prints a message on the console terminal, marking the successful completion of the bootstrap procedure. For example:

```
Enabling only console, disks, and tapes.

RSTS V8.0 (MT0)

Option:
```

For the bootstrap operation to succeed, the distribution medium must be online and ready; the medium accessed must contain a proper bootstrap record; and the console terminal must be online. The following two sections describe the bootstrap procedures for each of the distribution media. Section E.3 details hardware bootstrap procedures.

E.1 Bootstrapping Magnetic Tape Distribution

The operation of the magnetic tape devices is described in the *RSTS/E System User's Guide.* To bootstrap the magnetic tape, do the following:

Physically mount the system generation tape on unit 0 with the write enable ring removed.

Note

The 9–track, 800 bpi magnetic tape bootstrap in the system initialization code will not use a TU16, TE16, TU45, or TU77 tape drive if a TU10, TE10, or TS03 drive is present. Therefore, if your system includes drives of both types (TU10/TE10/TS03 and TU16/TE16/TU45/TU77), bootstrap the 800 bpi distribution tape on the TU10, TE10, or TS03 drive. Similarly, the 1600 bpi magnetic tape bootstrap will not use a TU16, TE16, TU45, or TU77 tape drive if a tape is mounted and online on a TS11 drive.

Ensure that the tape is at its load point. (The BOT indicator light comes on.) The computer does not bootstrap the device unless the tape is at its load point.

Set the ONLINE / OFFLINE switch on the tape unit to ONLINE and ensure that the RDY indicator is lit.

Ensure that the console terminal is online.

Follow the bootstrap instructions in Section E.3 for the type of hardware bootstrap device that is on the system.

E.2 Bootstrapping Disk Distribution

To bootstrap the disk cartridge, proceed as follows:

Insert the disk cartridge in a free unit.

Ensure that the RDY light is on.

Ensure that the WR PROT light is on.

Ensure that the console terminal is online.

Follow the instructions in Section E.3 for the type of hardware bootstrap device that is on the system.

E.3 Hardware Bootstrap Procedures

Bootstrapping a device involves using the Central Processor Unit (CPU) console switches or typing a command to the console emulator to access and activate a hardware loader. The hardware loader contains machine instructions for reading a bootstrap record from the device. The bootstrap record is transferred into memory and executes a specially designed software program. For the bootstrap operation to succeed, the device accessed must be online and ready; the medium accessed must contain a proper bootstrap record; and the console terminal must be online.

The PDP–11 console switches and their use are described in the various processor handbooks. The bootstrap procedure that you should use depends upon the type of hardware bootstrap device on the system. Table E–1 summarizes the addresses needed to bootstrap each device. The detailed procedures to bootstrap a device are presented according to the types of hardware bootstrap devices available.

Table E–1: Summary of Hardware Bootstrap Addresses

	Bootstrap Type								
Device to Bootstrap	**BM873–YA**	**BM873–YB***	**MR11–DB**	**BM792–YB**	**M9301–YA**	**M9301–YB**	**M9301–YC**	**M9301–YF**	**M9312**
RF11 disk	773000	773136	773100	777462					
RS03/RS04 disk					DS	DS	100	DS	DS
RK05 disk cartridge unit 0	773010	773030	773110	777406	DK	DK	30	DK	DK
RP02 or RP03 disk pack unit 0	773100	773350	773154	776716	DP	DP	40	DP	DP
RP04,RP05, RP06, RM02,RM03, RM05, or RM80 disk pack unit 0		773320				DB	70	DB	DB
RK05 disk (unit n)		773032			DKn	DKn	30+n	DKn	DKn
RL01/RL02 disk (unit n)									DLn
RK06 disk (unit n)								DMn	DMn
RK07 disk (unit n)									DMn
RP02 or RP03 disk pack (unit n)		773352			DPn	DPn	40+n	DPn	DPn
RP04,RP05,RP06, RM02,RM03, RM05, or RM80 disk (unit n)		773322				DBn	70+n	DBn	DBn
TU10/TE10 and TS03 magnetic tape	773050	773110	773136	**	MT	MT	10	MT	MTn
TU16/TE16/TU45/ TU77 magnetic tape		773150				MM	60	MM	MMn
TS11/TSV05/TU80 magnetic tape									MSn
MSCP devices***									DUn

* To bootstrap a nonzero disk unit, set the address in the Switch Register, press the LOAD ADRS switch, set the unit number in the Switch Register, and press the START switch.

** To bootstrap a TU10/TE10 or TS03 magnetic tape, use the loading routine described in Section E.3.11.

*** MSCP devices include the RA60, RA80, RA81, RC25, RX50, and RD51 disk drives.

E.3.1 BM873–YA Procedure

If the BM873–YA Restart/Loader is on the system, perform the following steps.

Move the CPU Console ENABLE/HALT switch to its HALT position and back to its ENABLE position.

Set the CPU Switch Register to one of the following values:

773000 for RF11 disk
773010 for RK05 disk cartridge
773100 for RP02 or RP03 disk pack
773050 for TU10/TE10/TS03 magnetic tape

Press the CPU LOAD ADRS switch.

Press the CPU START switch.

E.3.2 BM873–YB Procedure

If the BM873–YB Restart/Loader is on the system, perform the following steps.

Move the CPU Console ENABLE/HALT switch to its HALT position and back to its ENABLE position.

Set the CPU Switch Register to one of the following values:

773136 for RF11 disk
773030 for RK05 disk cartridge
773350 for RP02 or RP03 disk pack
773320 for RP04, RP05, RP06, RM02, RM03, RM05, or RM80 disk pack
773032 for RK05 disk unit specified in the Switch Register
773352 for RP02 or RP03 disk unit specified in the Switch Register
773322 for RP04, RP05, RP06, RM02, RM03, RM05, or RM80 disk unit specified in Switch Register
773110 for TU10/TE10/TS03 magnetic tape
773150 for TU16/TE16/TU45/TU77 magnetic tape

Press the CPU LOAD ADRS switch.

If necessary, set the CPU Switch Register to the unit number of the disk drive being bootstrapped.

Press the CPU START switch.

E.3.3 H324 Pushbutton Panel Procedure

If the system includes the H324 Pushbutton Panel option for the BM873 Restart/Loader, perform the following steps.

Move the CPU Console ENABLE/HALT switch to its HALT position and back to its ENABLE position.

While holding down the UNLOCK switch, press the appropriate switch to bootstrap the desired device. The DIGITAL field service engineer who installed the computer should have informed you of the device that each switch bootstraps.

Press the CPU START switch.

E.3.4 MR11–DB Procedure

If the MR11–DB Bulk Storage Loader is on the system, perform the following steps.

Move the CPU Console ENABLE/HALT switch to its HALT position and back to its ENABLE position.

Set the CPU Switch Register to one of the following values:

773100 for RF11 disk
773110 for RK05 disk cartridge
773154 for RP03 disk pack
773136 for TU10/TE10/TS03 magnetic tape

Press the CPU LOAD ADRS switch.

Press the CPU START switch.

E.3.5 BM792–YB Procedure

If the BM792–YB Hardware Loader is on the system, perform the following steps.

Move the CPU Console ENABLE/HALT switch to its HALT position and back to its ENABLE position.

Set the CPU Switch Register to 773100.

Press the CPU LOAD ADRS switch.

Set the CPU Switch Register to one of the following values:

777462 for RF11 disk
777406 for RK05 disk cartridge
776716 for RP03 disk pack

Press the CPU START switch.

E.3.6 M9301–YA and M9301–YB Procedures

If the M9301–YA or M9301–YB Bootstrap Terminator is on the system, perform the following steps.

While holding down the CTRL switch, press the BOOT switch on the front of the computer.

The bootstrap prints the contents (in octal) of registers R0, R4, and the Stack Pointer, and the Program Counter at the console terminal. It then prints a dollar sign prompt ($).

In response to the prompt, type the 2–character device code and the unit number of the device to be bootstrapped. Terminate your response by pressing RETURN.

Table E–2 describes the device codes.

Table E–2: Device Codes for M9301–YA and M9301–YB Bootstraps

Device	Code
TU10 / TE10 / TS03 Magnetic Tape	MT
TU16 / TE16 / TU45 / TU77 Magnetic Tape*	MM
RK05 Disk Cartridge	DK
RP02 / RP03 Disk Pack	DP
RP04 / RP05 / RP06 / RM02 / RM03 / RM05 / RM80 Disk Pack*	DB
RS03 / RS04 Fixed Head Disk*	DS
* M9301–YB Bootstrap Terminator only.	

E.3.7 M9301–YC Procedure

If the M9301–YC bootstrap is on the system, perform the following steps:

Move the CPU ENABLE / HALT switch to its HALT position and back to its ENABLE position.

Set the start address of 17765000 in the console switches.

Press the CPU LOAD ADDR switch.

Set the device unit number in switches 0 through 2.

Set the device code for the device to be bootstrapped in switches 3 through 6. Table E–3 lists the device codes.

Table E–3: Device Codes for M9301–YC Bootstrap

Device	Code
TU10 / TE10 / TS03 Magnetic Tape	1
RK05 Disk Cartridge	3
RP02 / RP03 Disk Pack	4
TU16 / TE16 / TU45 / TU77 Magnetic Tape	6
RP04 / RP05 / RP06 / RM02 / RM03 / RM05 / RM80 Disk Pack	7
RS03 / RS04 Fixed Head Disk	10

Ensure that switches 7 through 21 are off (down).

Press the CPU START switch.

Note

Before the M9301–YC bootstrap actually bootstraps the system, it performs CPU tests, instruction and addressing tests, and memory and cache tests. If a hardware failure is detected, the diagnostic program halts. The lights contain the ROM address of the halt. If this occurs, call the DIGITAL field service engineer.

It may, however, be possible to continue with the bootstrap operation if the lights contain the address 1773764, which indicates a cache failure. To continue in this case, press CONT. This is the ONLY case in which it is possible to continue bootstrapping after the diagnostic program detects an error.

E.3.8 M9301–YF Procedure

If the M9301–YF Bootstrap Terminator is on the system, perform the following steps.

While holding down the CTRL switch, press the BOOT switch on the front of the computer.

The bootstrap prints the contents (in octal) of registers R0, R4, the Stack Pointer, and R5 at the console terminal. It then prints a dollar prompt ($).

In response to the prompt, type the 2–character device code and the unit number of the device to be bootstrapped. Terminate your response by pressing RETURN. Table E–4 lists the device codes.

Table E–4: Device Codes for M9301–YF Bootstrap

Device	Code
TU10/TE10/TS03 Magnetic Tape	MT
TU16/TE16/TU45/TU77 Magnetic Tape	MM
RK05 Disk Cartridge	DK
RK06/RK07 Disk Cartridge	DM
RP02/RP03 Disk Pack	DP
RP04/RP05/RP06/RM02/RM03/RM05/RM80 Disk Pack	DB
RS03/RS04 Fixed Head Disk	DS

E.3.9 M9312 Procedure

The M9312 Bootstrap Module has five sockets that accommodate one CPU ROM and up to four peripheral boot ROMs. Each CPU and boot device has a unique ROM developed for it. The CPU ROM plugs into a specific socket location within the module. The peripheral ROMs, however, may be placed in any of the four peripheral socket locations as long as the sockets are filled in sequential order with no vacancies between loaded ROM sockets. Since a particular peripheral ROM has a different boot start address in each of the four sockets, it is sometimes important to know the locations of the ROMs in the bootstrap module. The ROM configuration is a diagram of where specific boot ROMs are located. This information must be known before the bootstrap procedure can begin. The following sections explain how to determine the ROM configuration if it is not known and how to bootstrap a device when the ROM configuration is known. Figure E–1 is a diagram of the ROM arrangement for the M9312 Bootstrap Module.

CPU
ROM
BOOT #1 ROM
BOOT #2 ROM
BOOT #3 ROM
BOOT #4 ROM

Figure E–1: M9312 ROM Arrangement

If the M9312 Bootstrap/Terminator is on the system, perform one of the following procedures:

- If you have the M9312 console emulator on your system, follow the procedures in Section E.3.9.1 (PDP–11/60s and PDP–11/70s usually do not have console emulators). If that procedure does not work, perform the next step to verify that you have a console emulator.
- If you have a CPU equipped with switch registers and *do not know* what devices the M9312 will boot, perform the procedures in Section E.3.9.2.
- If you have a CPU equipped with switch registers, *know* what device ROMs are on the M9312 Bootstrap Module, but do not have a console emulator, follow the procedures in Section E.3.9.3.
- If you do not have the M9312 Bootstrap/Terminator Module on your system and need to boot the RL01, RL02, or the RK07 disk device, perform the manual load routine described in Section E.3.10.

E.3.9.1 Using the M9312 Console Emulator

The M9312 console emulator can be initiated in two ways depending on the type of CPU (pushbutton or switch register) on the system.

1. *Pushbutton* boot procedures with the M9312 console emulator.

   While holding down the CTRL button, press the BOOT button on the CPU.

   The bootstrap prints the contents (in octal) of registers R0, R4, the Stack Pointer, and R5 at the console terminal. It then prompts you with the commercial at sign (@).

In response to the @ character, type the two-character device code and the unit number of the device to be bootstrapped. Terminate your response by pressing RETURN. If the unit number is not entered, it is assumed to be zero. Table E–7 contains the device codes.

Successful completion of these pushbutton bootstrap procedures produces header information on the console terminal, similar to the following example:

```
Enabling only console, disks, and tapes

RSTS V8.0 (MTO)

Option:
```

Begin system generation by referring to Phase 2—Disk Preparation.

2. *Switch register* boot procedures with the M9312 console emulator.

   - Move the CPU console ENABLE/HALT switch to its HALT position, then back to its ENABLE position.
   - Set the CPU switch register to 765020.
   - Press the start switch. The bootstrap prints the contents (in octal) of registers R0, R4, the Stack Pointer, and R5 at the console terminal. It then prompts you with the commercial at sign (@).

     In response to the @ character, type the two-character device code (in uppercase) and the unit number of the device to be bootstrapped. Terminate your response by pressing RETURN.* If the unit number is not entered, it is assumed to be zero. Table E–7 contains the device codes.

     Successful completion of the switch register bootstrap procedure produces header information on the console terminal, similar to the example given for the pushbutton bootstrap. After the message appears, begin system generation by referring to Phase 2—Disk Preparation.

E.3.9.2 Determining the M9312 Bootstrap ROM Configuration

If you do not know the M9312 ROM configuration, it can be determined by using Tables E–5 and E–7 and performing the instructions that follow Table E–5.

* The @ sign returns at this point if the correct boot ROM was not installed, or if a nonexistent device code is entered. If the contents of the registers R0, R4, the Stack Pointer, and R5 appear before the @ sign, this indicates that at least one boot ROM socket is empty and can accommodate another boot ROM.

Table E–5: ROM Locations

ROM Address	ROM Location
765774	Diagnostic ROM
773000	ROM 1
773200	ROM 2
773400	ROM 3
773600	ROM 4

Repeat the following steps for each of the ROM addresses shown in Table E–5. After you have completed this process, you will know the M9312 bootstrap ROM configuration of your system. With this information, you can boot any device having a boot ROM in the M9312 Bootstrap Module.

Table E–6: M9312 Bootstrap ROM Configuration

ROM Location	Bootable Device	Device Mnemonic
Diagnostic ROM		
ROM 1		
ROM 2		
ROM 3		
ROM 4		

- Select a six-digit ROM address from Table E–5.
- Set the CPU switches to the selected number.
- Press the LOAD ADRS switch to set the ROM address.
- Press the EXAM switch. The contents of the ROM address just loaded will appear in the CPU data register.
- Match the octal number represented in the CPU data register with the octal data number shown in Table E–7.
- Locate in Table E–7 the device mnemonic and the device name associated with the matching number. The ROM you have just investigated can boot the device(s) you located in Table E–7. Write the retrieved device information from Table E–7 with the appropriate ROM location in Table E–6. For example, if you selected a six-digit ROM address for ROM 1 from Table E–5, place the device mnemonic and name you located in Table E–7 with ROM 1 in Table E–6. Documenting the ROM configuration in Table E–6 will prevent performing the above procedure again.

Table E–7: Device Name and Mnemonic

Device To Be Booted	Mnemonic	Unit	Octal Data
RL01	DL	0–3	042114
RK06/RK07	DM	0–7	042115
RX01	DX	0–1	042130
RX02	DY	0–1	042131
RS03/RS04	DS	0–7	042123
RP02/RP03 RP04/RP05/RP06 RM02/RM03/RM05/ RM80	DP DB DB*	0–7 0–7	042120
RK03/RK05 TU55/TU56	DK DT	0–7 0–7	042113
TU16/TE16/TU45/ TU77	MM	0–7	046515
TU10/TE10/TS03	MT	0–7	046524
TS11/TSV05/TU80	MS	0–7	046523
RA60/RA80/ RA81/RC25/ RD51/RX50/ RA81/RA60/ RC25/RX50/ RD51(MSCP controller devices)	DU	0–7	042125
Console Emulator CPU ROM	A0	N/A	040460
Diagnostic ROM PDP–11/60/70	B0	N/A	041060
			177776** xxx777***

* Type DB rather than DR if you are booting the RM02, RM03, or RM05 disk.

** This is a continuation ROM of a multiple ROM boot.

*** Bad ROM or NO ROM present.

After you have determined the ROM configuration, perform the procedures in Section E.3.9.1 if you find you have a console emulator; otherwise, perform the procedures in Section E.3.9.3. The following section explains how to bootstrap with the M9312 module using a switch register controlled CPU.

E.3.9.3 Bootstrapping With the M9312

The following procedure describes how a device is bootstrapped when the M9312 bootstrap ROM configuration is known. Table E–8 provides the data needed to bootstrap a device.

- Locate in Table E–8 the name of the device to be booted.
- Determine from the ROM configuration (Table E–6) the location (ROM 1/2/3/4) of the device boot ROM.
- Select the three-digit Switch Register Code (SWR) from Table E–8 for the particular ROM location.
- Move the CPU console ENABLE/HALT switch to its HALT position, then back to its ENABLE position.
- Set the CPU switch register to 765744 (or 17765744 for PDP–11/70).
- Press the CPU LOAD ADRS switch.
- Set the Switch Register Code (SWR) selected from Table E–8 in CPU switches 0–8, as shown in Table E–9.
- Set the unit number of the boot device in CPU switches 9–11 (see Table E–9).
- Press the CPU START switch.

Successful completion of this process boots the device. A message, similar to the following example, appears on the console terminal. At this point, you may begin system generation by referring to Phase 2—Disk Preparation.

```
Enabling only console, disks, and tapes.

RSTS V8.0 (MT0)

Option:
```

Table E–8: Switch Register Codes (SWR)

Device to Be Booted	Switch Register Code (SWR)			
	ROM 1	ROM 2	ROM 3	ROM 4
RL01/RL02	012	212	412	612
RK06/RK07	012	212	412	612
RX01	012	212	412	612
RX02	012	212	412	612
RS03/RS04	012	212	412	612
RP02/RP03	012	212	412	612
RP04/RP05/RP06	056	256	456	656
RM02/RM03/RM05/RM80	056	256	456	656

(continued on next page)

Table E–8: Switch Register Codes (SWR) (Cont.)

Device to Be Booted	Switch Register Code (SWR)			
	ROM 1	ROM 2	ROM 3	ROM 4
RA80/RA81/RA60/RC25/RX50/RD51 (MSCP controller devices)	012	212	412	612
RK03/RK05	012	212	412	612
TU56	042	242	442	642
TU16/TE16/TU45/TU77	012	212	412	612
TU10/TE10/TS03	012	212	412	612

Table E–9: Console Switch Register Settings

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
				Octal Unit Number			Switch Register Code (SWR) from Table E–8								

E.3.10 Load Program Bootstrap for the RL01/RL02 and RK07

To bootstrap an RL01, RL02, or RK07 device when the system does not have the M9312 Bootstrap Module, you must manually enter a bootstrap load routine using the CPU console. The following procedure describes the manual load process using the PDP–11/34. A similar procedure is followed using the CPU LOAD ADRS, DEP, and EXAM switches for the PDP–11/70 computer.

- While holding down the CTRL button, press the HLT/SS button on the CPU.
- Set address 1000 in the console register by using the numbered console buttons.
- Press the LAD (load address) button.
- Press the CLR button to clear the register.
- Load the contents that appear below into memory, using the numbered buttons and the DEP button. Press the CLR button after you have placed the contents in the CPU register and pressed the DEP button.

	RL01/RL02 Bootstrap Routine	RK07 Bootstrap Routine
Address	Contents	Contents
1000	12700	12700
1002	174400	177440
1004	12760	12760
1006	13	0*
1010	4	10
1012	12701	12701
1014	4**	2003***
1016	10110	10110
1020	105710	105710
1022	100376	100376
1024	12760	12760
1026	177601	177400
1030	4	2
1032	5721	62701
1034	10110	16
1036	105710	10110
1040	100376	105710
1042	12760	100376
1044	177400	5710
1046	6	100001
1050	5060	0
1052	4	5007
1054	62701	
1056	6	
1060	10110	
1062	105710	
1064	100376	
1066	5710	
1070	100001	
1072	0	
1074	5007	

* Select drive number 0–7 for the RK07

** Load 4 for unit 0, 404 for unit 1, 1004 for unit 2, and 1404 for unit 3.

*** Load 3 for RK06.

After the contents are loaded, perform the following steps.

- Place address 1000 in the console register *again* by using the numbered buttons.
- Press the CPU LAD (load address) button to load the address.
- While holding the CTRL button down, press the START button on the CPU to boot the device.

  You can verify the accuracy of the load routine by using the CPU EXAM button. Place address 1000 in the register and press the LAD button. Press the EXAM button to reveal the contents of address 1000. It should be 12700 for both the RL01/RL02 and RK07 routines. Continue to press the EXAM button to check the contents of the remaining addresses in the load routine. Use the LAD and the DEP buttons to correct any erroneous contents.

E.3.11 Load Program Bootstrap for the TU10, TE10, or TS03

To bootstrap a TU10/TE10/TS03 magnetic tape when the system does not have a bootstrap that handles it, you must manually enter a load routine into memory using the CPU Console Switch Register and the DEP switch.

To load the routine, perform the following steps.

Move the CPU Console ENABLE/HALT Switch to its HALT position and back to its ENABLE position.

Set the CPU Switch Register to 010000.

Press the CPU LOAD ADRS switch.

Load the following contents into memory using the Switch Register and DEP switch.

Address	Contents
010000	012700
010002	172524
010004	005310
010006	012740
010010	060011
010012	105710
010014	100376
010016	005710
010020	100767
010022	012710
010024	060003
010026	105710
010030	100376
010032	005710
010034	100777
010036	005007

Set the Console Switch Register to 010000.

Press the CPU LOAD ADRS switch.

Press the CPU START switch.

If the system reads the tape but halts at address 010034, the magnetic tape generated a parity error. Try another drive and make it unit 0. If the system appears to take no action and halts, verify the accuracy of the routine by using the CPU Console EXAM switch. Use the Switch Register and the DEP switch to correct any erroneous contents. Rewind the tape to its load point before executing the routine again. If no recovery is successful, you should have a DIGITAL field service representative check the device. If the hardware is working properly, you should use a new magnetic tape reel.

System Generation Example F

This appendix provides you with a system generation example. Please note that the example was generated using base level 4. This means that some of the questions and output may be slightly different than what you see on your console terminal.

Please note the use of callouts in the right margin of the sample installation. The purpose of these callouts is to direct your attention to tasks and important events that occur during system generation. This is only a sample. Your responses and output will probably be different than what appears in this sample because your hardware and software requirements are not the same. Remember that you can press RETURN to any question or prompt to obtain an on-line explanation.

```
013274 061760 054422 011240
@MM0
Enabling only console, disks, and tapes.

RSTS T8.0 (MM0) INIT T8.0-04

Option: DSKINT

DD-MMM-YY? 21-JAN-83
HH:MM AM/PM? 5:37 AM

Disk? DM
Unit? 0

This disk pack appears to be a RSTS/E formatted
disk with the following characteristics:

Pack ID :                 SYSDSK
Pack Cluster Size :       4
Pack is currently :       Private,
                          Update access date on writes.

Pack ID? SYSDSK
Pack cluster size <1>? 4
MFD cluster size <16>?
SATT.SYS base <13543>?
Pre-extend directories <NO>? YES
PUB, PRI, or SYS <PRI>? SYS
[1,1] password <*>? NICTU
[1,1] cluster size <16>?
[1,2] password <*>? MIRAGE
[1,2] cluster size <16>?
[1,1] and [1,2] account base <13541>?
Date last modified <YES>?
New files first <NO>?
Read-only <NO>?
Use previous bad block info <YES>?
Format <NO>? YES
Patterns <3>?
Proceed (Y or N)? Y

Disk pack serial number = 56172

Starting format pass
End format pass

Pattern 3


DM0 Error      RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
               100230  177054  001010  040300  100301  000000  000616

Recoverable

Pattern 2


DM0 Error      RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
               100230  171542  001021  040300  100301  000000  000624

Recoverable

Pattern 1
```

Bootstrap distribution tape or disk.

Initialize the system disk.

```
DMO Error        RKCS1    RKWC     RKDA     RKCS2    RKDS     RKER     RKDCYL
                 100230   176770   001021   040300   100301   100000   000631
Recoverable


Option: COPY

21-Jan-83?
05:47 AM?

To which disk? DM
Unit? 0


Enabling only console, disks, and tapes.


RSTS T8.0 (DMO) INIT T8.0-04


Option: DSKINT

21-Jan-83?
05:50 AM?

Disk? DM
Unit? 1

This disk pack appears to be a RSTS/E formatted
disk with the following characteristics:

Pack ID :                WRKDSK
Pack Cluster Size :      4
Pack is currently :      Private,
                         Update access date on writes.

Pack ID? WRKDSK
Pack cluster size <1>? 4
MFD cluster size <16>?
SATT.SYS base <13543>?
Pre-extend directories <NO>? YES
PUB, PRI, or SYS <PRI>?
Create account [1,1] <NO>? YES
[1,1] password <*>?
[1,1] cluster size <16>?
Create account [1,2] <NO>? YES
[1,2] password <*>?
[1,2] cluster size <16>?
[1,1] and [1,2] account base <13541>?
Date last modified <YES>?
New files first <NO>?
Read-only <NO>?
Use previous bad block info <YES>?
Format <NO>? YES
Patterns <3>?
Proceed (Y or N)? Y
```

Initialize the system disk (continued).

Copy system generation files to system disk.

Initialize nonsystem disk.

```
Current BADB.SYS
   DCN        PCN
----------------
 11793        2948
 11797        2949
 13081        3270
 13085        3271


Disk pack serial number = 3136

Factory bad block data:
   Cyl  Track  Sec   Block  Cluster
   178    2     3   11795    2948
   198    0    17   13085    3271

Starting format pass
End format pass

Pattern 3


DM1 Error       RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
                100222  171102  001003  000201  100301  000200  000262
                100222  177502  001003  000201  100301  000200  000262
Bad block added to BADB.SYS
 Block Cluster
 11795    2948


DM1 Error       RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
                100222  176102  000021  000201  100301  000200  000306
                100222  177502  000021  000201  100301  000200  000306
 13085    3271

Pattern 2


DM1 Error       RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
                100222  171102  001003  000201  100301  000200  000262
                100222  177502  001003  000201  100301  000200  000262
Bad block added to BADB.SYS
 11795    2948


DM1 Error       RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
                100222  176102  000021  000201  100301  000200  000306
                100222  177502  000021  000201  100301  000200  000306
 13085    3271

Pattern 1


DM1 Error       RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
                100222  171102  001003  000201  100301  000200  000262
                100222  177502  001003  000201  100301  000200  000262
Bad block added to BADB.SYS
 11795    2948
```

Initialize nonsystem disk (continued).

Initialize nonsystem disk (continued).

```
DM1 Error        RKCS1   RKWC    RKDA    RKCS2   RKDS    RKER    RKDCYL
                 100222  176102  000021  000201  100301  000200  000306
                 100222  177502  000021  000201  100301  000200  000306
 13085     3271
```

List file status table for system disk.

```
Option: REFRESH

21-Jan-83?
06:00 AM?

Disk? DM
Unit? 0

Rebuild? NO

  REFRESH suboption? LIST

  File                 File          Current  Minimum    Start
  Name       Required? Flags Status   Size     Size       LBN

System files:

  SWAP   .SYS   YES            CRE               64
  SWAP0  .SYS    NO             OK
  SWAP1  .SYS    NO             OK
  SWAP3  .SYS    NO             OK
  OVR    .SYS    NO             OK
  ERR    .SYS    NO             OK               16
  BUFF   .SYS    NO             OK
  CRASH  .SYS    NO             OK

Others:

  BADB   .SYS            NOD             0
  SATT   .SYS        NOD CTG             2                 13541
  INIT   .SYS        NOD CTG           535                   241
  ERR    .ERR            CTG            16                   777
  SYSGEN.SIL             CTG           391                   793
  RT11   .RTS            CTG            20                  1185


  REFRESH suboption? EXIT
```

List the file status table for any nonsystem disks.

```
Option: REFRESH

21-Jan-83?
06:01 AM?

Disk? DM
Unit? 1

Rebuild? NO

  REFRESH suboption? LIST

  File                 File          Current  Minimum    Start
  Name       Required? Flags Status   Size     Size       LBN
```

```
System files:

  SWAP   .SYS    NO              OK
  SWAP0  .SYS    NO              OK
  SWAP1  .SYS    NO              OK
  SWAP3  .SYS    NO              OK
  OVR    .SYS    NO              OK
  ERR    .SYS    NO              OK                  16
  BUFF   .SYS    NO              OK
  CRASH  .SYS    NO              OK

Others:

  BADB   .SYS             NOD            16
  SATT   .SYS         NOD CTG             2              13541


  REFRESH suboption? EXIT

Option: REFRESH

21-Jan-83?
06:01 AM?

Disk? DM
Unit? 0

Rebuild? NO

  REFRESH suboption? CHANGE

  SWAP.SYS changes? YES

    Size? 27*32K

    Base? 11813

  SWAP0.SYS changes? NO

  SWAP1.SYS changes? NO

  SWAP3.SYS changes? NO

  OVR.SYS changes? NO

  ERR.SYS changes? NO

  BUFF.SYS changes? NO

  CRASH.SYS changes? YES

    Size? 288

    Base?

  Other files? NO

  REFRESH suboption? EXIT
```

List the file status table for any nonsystem disks (continued).

Create system files on system disk.

```
Option: REFRESH

21-Jan-83?
06:05 AM?

Disk? DM
Unit? 1

Rebuild? NO

  REFRESH suboption? CHANGE

  SWAP.SYS changes? NO

  SWAP0.SYS changes? YES


    Size? 15*32K

    Base? 11714

  SWAP1.SYS changes? NO

  SWAP3.SYS changes? YES


    Size? 12*32K

    Base? 11714

  OVR.SYS changes? YES


    Size? 182

    Base? 11714

  ERR.SYS changes? YES

    Size? 16

    Base? 11714

  BUFF.SYS changes? NO

  CRASH.SYS changes? NO

  Other files? NO

  REFRESH suboption? EXIT
```

Create system files on nonsystem disk.

```
Option: REFRESH

21-Jan-83?
06:08 AM?

Disk? DM
Unit? 0

Rebuild? NO

  REFRESH suboption? LIST

  File                      File           Current  Minimum    Start
  Name        Required?     Flags  Status    Size     Size      LBN

System files:

  SWAP   .SYS    YES    NOD CTG    OK      3456       64     14001
  SWAP0  .SYS    NO                OK
  SWAP1  .SYS    NO                OK
  SWAP3  .SYS    NO                OK
  OVR    .SYS    NO                OK
  ERR    .SYS    NO                OK                 16
  BUFF   .SYS    NO                OK
  CRASH  .SYS    NO     NOD CTG    OK       288                1205

Others:

  BADB   .SYS               NOD               0
  SATT   .SYS           NOD CTG               2               13541
  INIT   .SYS           NOD CTG             535                 241
  ERR    .ERR               CTG              16                 777
  SYSGEN.SIL                CTG             391                 793
  RT11   .RTS               CTG              20                1185

  REFRESH suboption? EXIT

Option: REFRESH

21-Jan-83?
06:09 AM?

Disk? DM
Unit? 1

Rebuild? NO

  REFRESH suboption? LIST
```

List the file status table for the system disk.

Note the current sizes and locations of any system files created.

List file status table for nonsystem disk.

```
 File                     File           Current  Minimum    Start
 Name       Required?     Flags  Status   Size     Size       LBN

System files:

 SWAP  .SYS    NO                 OK
 SWAP0 .SYS    NO     NOD CTG     OK      1920               14001
 SWAP1 .SYS    NO                 OK
 SWAP3 .SYS    NO     NOD CTG     OK      1536               15921
 OVR   .SYS    NO     NOD CTG     OK       182               11801
 ERR   .SYS    NO     NOD CTG     OK        16       16      11717
 BUFF  .SYS    NO                 OK
 CRASH .SYS    NO                 OK

Others:

 BADB  .SYS               NOD               16
 SATT  .SYS           NOD CTG                2               13541


 REFRESH suboption? EXIT


Option: INSTALL

Sil? SYSGEN
 Rebooting . . .


RSTS T8.0 (DMO) INIT T8.0-04

Option: HARDWR

 HARDWR suboption? LIST

 Name   Address Vector  Comments
 TT0:    177560   060
 RL:     174400   160   Units: 1(RL01) 2(RL02) 3(RL01)
 RM:     177440   210   Units: 0(RK06) 1(RK06) 2(RK07)
 TC:     177340   214
 TS0:    172520   150
 TU:     172440   224   Units: 0TE16 @TM03 #00
 PR0:    177550   070
 PP0:    177554   074
 LP0:    177514   200
 CR0:    177160   230
 KL0:    176500   300
 DH0:    160020   320
 XM0:    160110   330
 XM1:    160120   340
 DD0:    175610   310

 KW11L   177546   100
 KW11P   172540   104
 SR      177570
 DR      177570
```

List file status table for nonsystem disk (continued).

Note current sizes and locations of any system files created.

Install SYSGEN monitor.

List hardware configuration table.

```
  Hertz = 60.

  Other: Cache

  HARDWR suboption? EXIT
```

List hardware configuration table (continued).

```
Option: DEFAULT

No defaults are currently set in SYSGEN.SIL

You currently have: JOB MAX = 2, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? NO

Run Time System? RT11

Error message file? ERR

Installation name? RSTS/E SYSGEN

  Memory allocation table:

     0K: 00000000 - 00203777 (  33K) : EXEC
    33K: 00204000 - 00223777 (   4K) : RTS (RT11)
    37K: 00224000 - 00757777 (  87K) : USER
   124K: 00760000 - End              : NXM

  Table suboption?

You currently have crash dump enabled.

Crash dump? YES

Magtape labelling default <none>? DOS

Preferred clock <P 100>?

Date format <ALPHABETIC>?

Time format <AM/PM>?

Power fail delay <300>? 60
```

Establish SYSGEN monitor defaults.

```
Option: START

You currently have: JOB MAX = 2, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? NO

Any memory allocation changes? NO

You currently have crash dump enabled.

Crash dump? YES
```

Start SYSGEN monitor.

```
21-Jan-83?
06:14 AM?
DF0: disabled - no RF: controller
DF0: disabled - unit not present
DS0: disabled - no RS: controller
DS1: disabled - no RS: controller
DS0: disabled - unit not present
DS1: disabled - unit not present
DK0: disabled - no RK: controller
DK1: disabled - no RK: controller
DK2: disabled - no RK: controller
DK3: disabled - no RK: controller
DK0: disabled - unit not present
DK1: disabled - unit not present
DK2: disabled - unit not present
DK3: disabled - unit not present
DL0: disabled - unit not present
DP0: disabled - no RP: controller
DP1: disabled - no RP: controller
DP0: disabled - unit not present
DP1: disabled - unit not present
DR0: disabled - no RR: controller
DR1: disabled - no RR: controller
DR0: disabled - unit not present
DR1: disabled - unit not present
DB0: disabled - no RB: controller
DB1: disabled - no RB: controller
DB0: disabled - unit not present
DB1: disabled - unit not present
No RU0: controller
DU0: disabled - unit not present
DU1: disabled - unit not present
DU2: disabled - unit not present
DU3: disabled - unit not present
MT0: disabled - no TM: controller
MT1: disabled - no TM: controller
MS1: disabled - no TS1: controller

34 devices disabled

?Can't find file or account
.R MM0:CREATE.SAV
```

Start SYSGEN monitor (continued).

Note list of disabled devices.

Run CREATE.SAV program.

```
^C
HELLO 1/2
Password:
1 other user is logged in under this account

.
.ASSIGN MM0: .DOS

.ASSIGN MM0: IN
```

Run CREATE.SAV program (continued).

Note the files PIP.SAV copies to the system disk.

```
.R IN:PIP.SAV
*SY:$*.*<232>=IN:$LOGIN.SAV,$LOGOUT.SAV,$PIP.SAV
*SY:$*.*<124>=IN:$UTILTY.SAV
*SY:$*.*<104>=IN:$MACRO.SAV,$CREF.SAV,$LINK.SAV
*SY:$*.*<124>=IN:$SILUS.SAV,$HOOK.SAV
*SY:$*.*<124>=IN:$SYSBAT.SAV,$SYSGEN.SAV
*SY:$*.*<124>=IN:$ONLPAT.SAV
*DK:$*.*< 40>=IN:$ERR.STB,$PIPSAV.TXT
*SY:[0,1]*.*<40>=IN:$TECO.RTS
*SY:[0,1]*.*/MO:16=SY:[0,1]TECO.RTS
*SY:$*.*<104>/RTS:TECO=IN:$TECO.TEC
*^C

.DEASSIGN IN

.DEASSIGN MMO:

.R LOGOUT
Confirm: Y
Saved all disk files; 564 blocks in use
Job 2 User 1,2 logged off KB1 at 21-Jan-83 06:16 AM
1 other user still logged in under this account
System RSTS T8.0-02 RSTS/E SYSGEN
Run time was 6.9 seconds
Elapsed time was 2 minutes
Good morning
```

Answer general configuration questions.

```
**21-Jan-83**


Beginning of RSTS/E  system  generation.


Questions come in long and short  forms.
If  you  are  familiar with them, answer
"S" for short; otherwise, answer "L" for
long form.

Form ?                          #S #

Same system ?                   #Y #

Distribution medium ?           #MM#

Output medium ?                 #SY#

Delete files ?                  #NO#

LP for SYSGEN ?                 #NO#

Generate monitor ?              #Y #

Monitor name ?                  #RSTS#  RSTS80

Monitor patching ?              #??#    Y
```

```
Patch file medium ?            #MM#
Patch file name ?              #$MONITR.CMD#
Generate BASIC-PLUS ?          #Y #
BASIC-PLUS RTS name ?          #BASIC#
BASIC-PLUS patching ?          #??#     Y
Patch file medium ?            #Identical to monitor#
Patch file name ?              #$BASIC.CMD#
RSX as default RTS ?           #NO#     Y
RSX patching ?                 #??#     Y
Patch file medium ?            #Identical to monitor#
Patch file name ?              #$RSXRTS.CMD#
```

Answer general configuration questions (continued).

```
Now you must specify the  hardware  con-
figuration  on  which this RSTS/E system
will run.

DL11A compatible lines ?         *02*
DL11C, DL11D's ?                 *00*
DL11E,DLV11E's ?                 *00*
DJ11's ?                         *00*
DH11's ?                         *01*
DH11 unit 00 lines enabled ?     #16#
Dataset support for DH11's ?     *NO*
DZ11/DZV11's ?                   *00*
Pseudo keyboards ?               #04#     8
2741 support ?                   #NO#
Multi-terminal service ?         #Y #
Echo control ?                   #Y #
One-line status report ?         #Y #
FMS-11 support ?                 #NO#
Multiple private delimiters ?    #NO#
```

Answer terminal interface configuration questions.

Answer disk units configuration questions.

```
RF/RS11's ?                        *NO*
RS03/RS04's ?                      *00*
RK05's ?                           *00*
RL01/RL02's ?                      *04*
Overlapped seek ?                  *Y *
RK06/RK07's ?                      *03*
Overlapped seek ?                  *Y *
RP02/RP03's ?                      *00*
RM02/RM03/RM05/RM80's ?            *00*
RP04/RP05/RP06's ?                 *00*
MSCP controllers ?                 *00*
```

Answer peripheral devices configuration questions.

```
TU16/TE16/TU45/TU77's ?            *08*
TU10/TE10/TS03's ?                 *00*
TS11/TSV05's ?                     *01*    1
DECtapes ?                         *08*    0
TU58's ?                           *08*    0
Printers ?                         *01*
RX01/RX02's ?                      *00*
CR11/CM11 card reader ?            *Y *    N
CD11 card reader ?                 *NO*
P.T. reader / punch ?              *Y *
DECnet network support ?           *Y *    N
DMC11's/DMR11's ?                  *02*    0
KMC11's ?                          *00*
Extended buffering for LP ?        *Y *
RJ2780 support ?                   *NO*
```

```
Maximum jobs ?                       #10#    27
Small buffers ?                      #323#
System wide logicals ?               #25#    10
Monitor statistics ?                 #NO#
EMT Logging ?                        #NO#
FIP buffering ?                      #Y #
Extended data buffering ?            #NO#
Resident libraries ?                 #Y #
RSX directives ?                     #Y #
Resident file OPEN/CLOSE ?           #Y #
Resident send/receive ?              #Y #
Resident simple SYS calls ?          #Y #
Resident file DELETE/RENAME ?        #Y #
Res. login/attach/attribute ?        #Y #
Resident directory lookup ?          #Y #
```

Answer software tuning and features configuration questions.

```
The  following  questions  deal  with the
BASIC-PLUS run-time system

FPP ?                                *NO*
FIS ?                                *NO*
Math precision ?                     #02#
Log functions ?                      #Y #
Trig functions ?                     #Y #
Print using ?                        #Y #
Matrices ?                           #NO#
String arithmetic ?                  #NO#
```

Answer BASIC–PLUS run-time system configuration questions.

```
The system generation  dialog is finish-
ed. If you have any special requirements
which require editing the generated file
CONFIG.MAC(system configuration file) or
SYSGEN.CTL(batch control file)  you  may
do it now.When ready type 'RUN $SYSBAT'.
```

```
.RUN $SYSBAT


SYSGEN batch processing has started.
If any problems develop during the batch
process it may be aborted by typing
"Control/C". To restart type "R SYSBAT".



  ^C
  HELLO 1/2
  Password:
  1 other user is logged in under this account

  .
  .SIZE 20

MOUNT AP-2773K-BC OR BB-H751K-BC ON A MAGTAPE DRIVE

WITH NO 'WRITE RING' AND SET TO 'ON LINE'

Mount MM:'SYSGNK'-write locked
Unit ? 0
  .ASSIGN  MM0: .DOS

  .ASSIGN  MM0: TAPE

  .R PIP.SAV
  **.*<40>=TAPE:$COMMON.MAC
  **.*=TAPE:$*.MAC/HALT/NOREW
  *SY:$*.*<40>/PR:NOWARN=TAPE:$SYSLIB.OBJ/NOREW
  **.*=TAPE:$*.OBJ/HALT/NOREW
  **.*<104>=TAPE:$*.SAV/HALT/NOREW
  *ONLCLN.SAV<232>/RE
  *SAVRES.SAV<124>/RE
  *DEFALT.SAV<60>/RE
  **.*=TAPE:$*.STB/HALT/NOREW
  **.*<60>=TAPE:$MINCOP.BAS/NOREW
  *^C


Dismount MM0:
  .DEASSIGN  TAPE

  .DEASSIGN  MM0:


  .ASSIGN  SY:  IN

  .R PIP.SAV
  *TBL.OBJ,TTDINT.OBJ,TTDVR.OBJ/DE:NOWARN
  *TBL.LST,TTDINT.LST,TTDVR.LST/DE:NOWARN
  *RSTS.SAV,TER.SAV,DSK.SAV,XVR.SAV/DE:NOWARN
```

Run SYSBAT.SAV program.

Note that SYSBAT.SAV asks the sample installation to mount the RSTS/E distribution tape. Make sure you mount the tape or disk requested by SYSBAT.SAV. The number and types of tapes or disks you mount depend on how you answered the configuration questions; thus, your installation will probably differ from the sample installation. Please check Chapter 3 of the RSTS/E Release Notes for the order numbers of your RSTS/E distribution tape or disk.

SYSBAT.SAV output.

```
*GEN.SAV,EMT.SAV,FIP.SAV,FMS.SAV,OVR.SAV/DE:NOWARN
*RSTS.MAP,TER.MAP,DSK.MAP,XVR.MAP/DE:NOWARN
*GEN.MAP,EMT.MAP,FIP.MAP,FMS.MAP,OVR.MAP/DE:NOWARN
*RSTS.STB,TER.STB,DSK.STB,XVR.STB/DE:NOWARN
*GEN.STB,EMT.STB,FIP.STB,FMS.STB,OVR.STB/DE:NOWARN
*NSP.SAV,TRN.SAV,SES.SAV,RJ2780.SAV/DE:NOWARN
*NSP.MAP,TRN.MAP,SES.MAP,RJ2780.MAP/DE:NOWARN
*NSP.STB,TRN.STB,SES.STB,RJ2780.STB/DE:NOWARN
*CRA.SAV,CRA.MAP,CRA.STB/DE:NOWARN
*MCP.SAV,MCP.MAP,MCP.STB/DE:NOWARN
*^C

.R MACRO.SAV
*TTDVR,TTDVR/C=IN:COMMON,KERNEL,DK:CONFIG,IN:CHECK,KBDEF,TTDVR
ERRORS DETECTED:  0

*^C

.R MACRO.SAV
*TTDINT,TTDINT/C=IN:COMMON,KERNEL,DK:CONFIG,IN:CHECK,KBDEF,TTDINT
ERRORS DETECTED:  0

*^C

.R MACRO.SAV
*TBL,TBL/C=IN:COMMON,KERNEL,DK:CONFIG,IN:CHECK,TBL
ERRORS DETECTED:  0

*^C

.R LINK.SAV
*RSTS/Z,RSTS/A/W,RSTS=TBL,$ERR.STB/X/B:0/U:#1000/I/C
*TTDINT/C
*IN:RSTS
Round section? MORBUF
Library search? SYDLRG
Library search? BUF
Library search? LPDVRX
Library search?
*^C

.R LINK.SAV
*DSK/Z,DSK/A/W,DSK=IN:DSK,DK:RSTS.STB/X/B:#117000/U:#100/I/C
*IN:RSTS
Round section? DSKPAT
Library search? DLSEEK
Library search? DMSEEK
Library search?
*^C

.R LINK.SAV
*TER/Z,TER/A/W,TER=IN:TER,DK:RSTS.STB/X/B:#117000/U:#100/C
*TTDVR/C
*IN:RSTS
Round section? LPTOVR
*^C
```

SYSBAT.SAV output (continued).

SYSBAT.SAV output (continued).

```
.R LINK.SAV
*CRA/Z,CRA/A/W,CRA=IN:CRA,DK:RSTS.STB/X/B:#117000/U:#100
Round section? CRAPAT
*^C

.R LINK.SAV
*GEN/Z,GEN/A/W,GEN=IN:GEN,DK:RSTS.STB/X/B:#117000/U:#100/I/C
*IN:RSTS
Round section? GENPAT
Library search? EMU
Library search?
*^C

.R LINK.SAV
*EMT/Z,EMT/A/W,EMT=IN:EMT,DK:RSTS.STB/X/B:#117000/U:#100/I/C
*IN:RSTS
Round section? EMTPAT
Library search? LIB
Library search?
*^C

.R LINK.SAV
*FIP/Z,FIP/A/W,FIP=IN:FIPLRG,DK:CRA.STB/X/B:#137000/U:#100/I/C
*IN:RSTS
Round section? FIPPAT
Library search?
*^C

.R LINK.SAV
*OVR/Z,OVR/A/W,OVR=IN:OVRLRG,DK:FIP.STB/X/B:#1000/Q/C
*IN:RSTS
Load section:address? TBLEXT:3000
Load section:address?
*^C

.R SILUS.SAV
*SY0:[0,1]RSTS80.SIL,TT:=RSTS/C
*CRA/M/C/A
*EMT/M/C
*GEN/M/C
*TER/M/C
*DSK/M/C
*FIP/M/C
*OVR/M/C/A
*IN:DEFALT/A
Directory of SIL RSTS80.SIL on 21-Jan-83 at 06:39 AM

 Name   Ident    Load    Size   Transfer Total

RSTS    08.004  000000  111000  000001   19K
CRA     08.004  120000  002700  000001   19K
EMT     08.004  120000  014400  000001   23K
GEN     08.004  120000  013700  000001   26K
TER     08.004  120000  016400  000001   29K
DSK     08.004  120000  005500  000001   31K
FIP     08.004  140000  010100  000001   33K
OVR     08.004  002000  116000  000001   52K
DEFALT  08.004  001000  002000  000001   53K
```

```
Resident monitor size is 37K.  By increasing this size
with the DEFAULT option of INIT, you can set additional
small buffers.  This table shows the number and type of
small buffers you can set with each size change.

Additional                 Number of buffers
K-words of        With Data Space            Without Data Space
buffer space       General    FIP              General    FIP
-----------------------------------------------------------------
     0K              328       12                328       12
     1K              387       16                328       76
     2K              456       12                328      124
     3K              515       16                ---      ---
     4K              515       80                ---      ---
     5K              515      144                ---      ---
     6K              515      208                ---      ---
     7K              515      254                ---      ---

If you choose to run SYSGEN again, you may specify up
to 664 small buffers for this system.  Doing so will
increase some of the buffer counts in the table.


*^C

.RUN LIBR.SAV
*SY:$SYSLIB=SY:$SYSLIB,DK:OVLHD/U
*^C

.R PIP.SAV
*BASIC.SAV,BASIC.STB/DE:NOWARN
MOUNT AP-2773K-BC OR BB-H751K-BC ON A MAGTAPE DRIVE

WITH NO 'WRITE RING' AND SET TO 'ON LINE'

Mount MM:'SYSGNK'-write locked
Unit ? 0
*^C

.ASSIGN   MM0: .DOS

.ASSIGN   MM0: TAPE

.R PIP.SAV
**.*=TAPE:$RTS.OBJ
**.*=TAPE:$*.OBJ/HALT/NOREW
*^C
```

SYSBAT.SAV output (continued).

Note the small buffer table. It tells you how many small buffers you can specify if you run SYSGEN.SAV again. In the sample installation, the number of small buffers that can be specified is 664.

Note that SYSBAT.SAV again asks the sample installation to mount the RSTS/E distribution tape. Remember to check Chapter 3 of the RSTS/E Release Notes for the order number of your RSTS/E distribution tape or disk.

```
Dismount MM0:
  .DEASSIGN  TAPE

  .DEASSIGN  MM0:

  .R LINK.SAV
  *BASIC/Z,BASIC/A/W,BASIC=IN:RTS,DK:$ERR.STB/X/H:#177776/U:#4000/C
  *IN:MA2/C
  *IN:XL2/C
  *IN:XT2/C
  *IN:IO/C
  *IN:PU/C
  *IN:SN/C
  *IN:VE
  Round section? PA
  *^C

  .R SILUS.SAV
  *BASIC.RTS,TT:=BASIC
  Directory of SIL BASIC .RTS on 21-Jan-83 at 06:42 AM

   Name    Ident     Load     Size   Transfer Total

  BASIC   08.006  104000  073776  000001   15K




  *^C

  .DEASSIGN  IN

MOUNT AP-2773K-BC OR BB-H751K-BC ON A MAGTAPE DRIVE

WITH NO 'WRITE RING' AND SET TO 'ON LINE'

Mount MM:'SYSGNK'-write locked
Unit ? 0
  .ASSIGN  MM0: .DOS

  .ASSIGN  MM0: IN

  .R PIP.SAV
  **.*  =IN:$RSX.RTS
  **.CSP=IN:$MINCOP.TSK/NOREW
  **.CSP=IN:$PATCPY.TSK/NOREW
  **.CSP=IN:$LOGIN .TSK/NOREW
  **.CSP=IN:$BUILD .TSK/NOREW
  **.CSP=IN:$ATPK   .TSK/NOREW
  **.CSP=IN:$CPATCH.TSK/NOREW
  **.CSP=IN:$AUTOED.TSK/NOREW
  *^C
```

SYSBAT.SAV output (continued).

Note SYSBAT.SAV again asks sample installation to mount RSTS/E distribition tape. Remember to check Chapter 3 of the <u>RSTS/E Release Notes</u> for the order number of your RSTS/E distribution tape or disk.

```
Dismount MM0:
  .DEASSIGN  IN

  .DEASSIGN  MM0:

MOUNT THE MONITOR PATCH FILE MAGTAPE ON A MAGTAPE DRIVE

WITH NO 'WRITE RING' AND SET TO 'ON LINE'

Mount MM:'       '-write locked
Unit ? 0
  .ASSIGN  MM0: .DOS

  .ASSIGN  MM0: PATCH

  .R ONLPAT.SAV
  Command file name? PATCH:$MONITR.CMD
  !
  !       MONITR.CMD - August 1982 Field Test
  !       RSTS/E V8.0 Patch Kit 'A'
  !
  !       Seq 3.x - Executive
  !       Includes all mandatory RSTS/E V8.0 Monitor, Terminal Service,
  !       File Processor, and Device Driver patches published in the
  !       RSTS/E Software Dispatch.
  !       Patches included in this file are listed below.
  !
  !       Seq 3.9.1 M      June 1982*
  !
  !
  !       Seq 3.9.1 M, June 1982
  !       Executive
  !       FMS Monitor Patches
  ! SYSTEM MAY CRASH WITH MIXED PICTURE FIELD INPUT
  ! MANDATORY FMS MONITOR PATCH
  ! COPYRIGHT (C) 1982 BY DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
  !
  ! NOTE: This patch is for RSTS/E V7.2 or later ONLY.  It is not to be
  applied
  !       to RSTS/E V7.1.  Also, the patch described in the 'FMS-11/RSTS
  !       Installation Guide and Release Notes' is for RSTS/E V7.1 and
  !       is NOT to be applied to RSTS/E V7.2 or later systems.
  !
  !       This patch will only apply if you generated FMS-11 support in
  !       your monitor.  If the FMS-11 code was not included, the patch
  !       will fail with a 'Module not found in SIL' error after you
  !       specify FMS as the Module name.
  !
  File to patch? SY0:[0,1]RSTS80.SIL
  File found in account [0,1]
  Module name? FMS
  Module not found in SIL
  Module name?
  Command file sequence error
  ^C
  Patch complete - no modifications made
```

SYSBAT.SAV output (continued).

SYSBAT.SAV asks the sample installation to mount the RSTS/E update kit.

SYSBAT.SAV chains to the ONLPAT.SAV program, which performs automatic patching and module replacement.

ONLPAT.SAV performing patches and module replacement.

ONLPAT.SAV output (continued).

```
!
!       The following patches are ONLY for this field test of RSTS.
!              DO NOT apply these patches to any 7.1 or 7.2 systems.
!
!
!
!
!       Seq 3.1.997 M, January 1983
!       Executive
!       Monitor Patches
! MANDATORY PATCH
! CORRECTIONS TO TWO NON-PRIVILEGED FUNCTIONS
! COPYRIGHT (C) 1983 BY DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
!
File to patch? SY0:[0,1]RSTS80.SIL
File found in account [0,1]
Module name? OVR
Base address? SLIO
Offset address? 150
 Base    Offset  Old     New?
076000  000150  000036  ? 34
076000  000152  105764  ? ^C
Patch complete



File to patch? SY0:[0,1]RSTS80.SIL
File found in account [0,1]
Module name? OVR
Base address? LOG3
Offset address? 10
 Base    Offset  Old     New?
036000  000010  006000  ? 16000
036000  000012  000002  ? ^Z (CTRL/Z FOR NEW OFFSET)
Offset address? 250
 Base    Offset  Old     New?
036000  000250  002000  ? 12000
036000  000252  000002  ? ^Z (CTRL/Z FOR NEW OFFSET)
Offset address? 330
 Base    Offset  Old     New?
036000  000330  006000  ? 16000
036000  000332  001005  ? ^C
Patch complete



!
!       Seq. 3.1 M, January 1983
!       Fix problem with read accounting data not resetting
! MANDATORY MONITOR PATCH  for RSTS T8.0-04
! COPYRIGHT (C) 1983 BY DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
```

ONLPAT.SAV output (continued).

```
!
File to patch? SY0:[0,1]RSTS80.SIL
File found in account [0,1]
Module name? OVR
Base address? DIR1
Offset address? 140
 Base    Offset  Old     New?
006000  000140  001351  ? 4767
006000  000142  005116  ? 712-144
006000  000144  005714  ? ^Z
Offset address? 712
 Base    Offset  Old     New?
006000  000712  000000  ? BNE+3
006000  000714  000000  ? COM+66
006000  000716  000000  ? 4
006000  000720  000000  ? 207
006000  000722  000000  ? TRAP+PRVIOL
006000  000724  000000  ? ^Z
Offset address? ^Z
Base address? DIR1SI
Offset address? 0
 Base    Offset  Old     New?
002042  000000  000712  ? 724
002042  000002  015356  ? ^C
Patch complete


!
!       Seq 3.5.33 M, January 1983
!       Executive
!       File Processor Patches
! DISABLE UU.SPL ROUTING TO NEW SPOOLER
! MANDATORY MONITOR PATCH
! COPYRIGHT (C) 1983 BY DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
!
File to patch? SY0:[0,1]RSTS80.SIL
File found in account [0,1]
Module name? OVR
Base address? ..NSPL
Offset address? 0
 Base    Offset  Old     New?
107006  000000  046521  ? 0
107006  000002  047101  ? ^C
Patch complete


!
!       SEQ 3.5. M, JANUARY 1983 FIELD TEST
!
!       PREVENT MONITOR LOOP IF ADDING LOTS OF ACCOUNTS
! COPRIGHT (C) 1983 DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
```

ONLPAT.SAV output (continued).

```
!
File to patch? SY0:[0,1]RSTS80.SIL
File found in account [0,1]
Module name? FIP
Base address? CTL
Offset address? 2514
 Base    Offset  Old      New?
140236  002514  101357  ? 101011
140236  002516  004767  ? ^C
Patch complete




5 patches installed
1 patch skipped

Command file name? ^C

.R ONLPAT.SAV
Command file name? PATCH:$BASIC.CMD
!
!       BASIC.CMD
!
!       Seq 4.1, November 1982 Field Test
!       BASIC-PLUS
!       BASIC-PLUS Patches
! COPYRIGHT (C) 1982 BY DIGITAL EQUIPMENT CORP., Maynard, MASS.
! There are currently no mandatory patches for the BASIC-PLUS RTS.
!
File to patch? BASIC.RTS
Base address? ^Z
File to patch? ^Z
Patch complete




1 patch installed

Command file name? ^C

.R ONLPAT.SAV
Command file name? PATCH:$RSXRTS.CMD
!
!       RSXRTS.CMD
!
!       Seq 21.3, January 1983 Field Test
!       RSX Emulator Package
!       RSX.RTS
! COPYRIGHT (C) 1983 BY DIGITAL EQUIPMENT CORP., Maynard, MASS.
!
!
!       SEQ 21.3. M, JANUARY 1983 FIELD TEST
```

```
!
!       ATTACH TO R/W CLUSTER LIBRARIES PROPERLY
!       MANDATORY PATCH
!       COPYRIGHT (C) 1983 DIGITAL EQUIPMENT CORPORATION, MAYNARD, MAS
S.
!
File to patch? RSX.RTS
Base address? ..RUN
Offset address? 1574
 Base    Offset  Old     New?
174416  001574  016014  ? 4737
174416  001576  000024  ? PATCH
174416  001600  052714  ? ^Z
Offset address? ^Z
Base address? PATCH
Offset address? 0
 Base    Offset  Old     New?
177106  000000  000000  ? 12714
177106  000002  000000  ? 1
177106  000004  000000  ? 5760
177106  000006  000000  ? 24
177106  000010  000000  ? 100002
177106  000012  000000  ? 12714
177106  000014  000000  ? 2
177106  000016  000000  ? 11460
177106  000020  000000  ? 24
177106  000022  000000  ? 207
177106  000024  000000  ? ^C
Patch complete



1 patch installed

Command file name? ^C


Dismount MM0:
 .DEASSIGN  PATCH

 .DEASSIGN  MM0:

 .R PIP.SAV
 *SY0:[0,1]*.*/MODE:16.=BASIC.RTS
 *^C

 .R PIP.SAV
 *SY0:[0,1]*.*/MODE:16.=RSX.RTS
 *SY:$PATCPY.TSK<124>/RTS:RSX/PR:NOWARN=PATCPY.CSP
 *SY:$LOGIN.TSK<232>/RTS:RSX/PR:NOWARN=LOGIN.CSP
 *SY:$BUILD.TSK<124>/RTS:RSX/PR:NOWARN=BUILD.CSP
 *SY:$ATPK.TSK<124>/RTS:RSX/PR:NOWARN=ATPK.CSP
 *SY:$CPATCH.TSK<124>/RTS:RSX/PR:NOWARN=CPATCH.CSP
 *SY:$AUTOED.TSK<124>/RTS:RSX/PR:NOWARN=AUTOED.CSP
 *BASIC.RTS/DE
 *^C
```

ONLPAT.SAV output (continued).

End of automatic patching and module replacement.

SYSBAT.SAV finishes processing.

```
.R PIP.SAV
*RSX.RTS/DE
*MINCOP.BAS/DE
*MINCOP.CSP/DE
*LOGIN.CSP,BUILD.CSP,ATPK.CSP/DE
*PATCPY.CSP,CPATCH.CSP,AUTOED.CSP/DE
*^C

.R LOGOUT
Confirm: Y
Saved all disk files; 6208 blocks in use
Job 2 User 1,2 logged off KB1 at 21-Jan-83 06:49 AM
1 other user still logged in under this account
System RSTS T8.0-02 RSTS/E SYSGEN
Run time was 11 minutes, 26.7 seconds
Elapsed time was 27 minutes
Good morning
```

SYSBAT.SAV finishes processing (continued).

```
Batch Job completed.
```

SYSBAT.SAV now finished processing.

```
.R UTILTY
*NO LOGINS
*SHUTUP
```

Shut down the SYSGEN monitor.

```
RSTS T8.0-02 RSTS/E SYSGEN (DMO) INIT T8.0-04

Option: INSTALL

Sil <SYSGEN>?

Type the filename of the monitor save image library.

Directory of all .SIL files in [0,1]:

SYSGEN.SIL
RSTS80.SIL

Sil <SYSGEN>? RSTS80
```

Install RSTS/E monitor.

```
Option: PATCH
File to patch?
Module name? OVR
Base address? LOG4
Offset address? 532
 Base    Offset  Old     New?
037000  000532  012704  ? 16604
037000  000534  000022  ? ^C
```

Note that this particular system generation required entering a manual patch to the RSTS/E monitor. Do not enter this patch to your installation. If you ever have to enter a manual patch you will be instructed to do so by your software support representative. Or, the RSTS/E Release Notes will contain the manual patch instructions. In most cases, all patches and replacement modules should be on the RSTS/E update kit.

```
Option: SET

  SET suboption? LIST
  Device? ALL

  Name  Control Comments

  DL0   RL:
  DL1   RL:
  DL2   RL:
  DL3   RL:
  DM0   RM:
  DM1   RM:
  DM2   RM:
  KB0   TT:
  KB1   KL0:
  KB2   PK0:
  KB3   PK1:
  KB4   PK2:
  KB5   PK3:
  KB6   PK4:
  KB7   PK5:
  KB8   PK6:
  KB9   PK7:
  KB10  DH0:0
  KB11  DH0:1
  KB12  DH0:2
  KB13  DH0:3
  KB14  DH0:4
  KB15  DH0:5
  KB16  DH0:6
  KB17  DH0:7
  KB18  DH0:8
  KB19  DH0:9
  KB20  DH0:10
  KB21  DH0:11
  KB22  DH0:12
  KB23  DH0:13
  KB24  DH0:14
  KB25  DH0:15
  NL0
  PK0
  PK1
  PK2
  PK3
  PK4
  PK5
  PK6
  PK7
  LP0   LP0:    NOOMITCR,CR,NOEOT,FILL,NOCONTROL,NO8BIT,BSEMULATE, width 132, lower case
  PR0   PR0:
  PP0   PP0:
  MM0   TU:
  MM1   TU:
  MM2   TU:
  MM3   TU:
  MM4   TU:
```

List status of all devices.

```
  MM5    TU:
  MM6    TU:
  MM7    TU:
  MS0    TS0:

  SET suboption? EXIT
```

List status of all devices (continued).

```
Option: DEFAULT

No defaults are currently set in RSTS80.SIL

You currently have: JOB MAX = 27, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? NO

Run Time System?

Specify the name of the Run Time System to be used as the  system
default.  The named Run Time System must exist on the system disk
in account [0,1] with extension '.RTS'.

Directory of all valid run time systems:

RT11.RTS
BASIC.RTS
RSX.RTS

Name of default Run Time System? RSX

Error message file? ERR

Installation name? MY SYSTEM
```

Establish defaults for RSTS/E monitor.

Note the sample installation's directory of all valid run-time systems.

```
  Memory allocation table:

     0K: 00000000 - 00223777 (   37K) : EXEC
    37K: 00224000 - 00237777 (    3K) : RTS (RSX)
    40K: 00240000 - 00757777 (   84K) : USER
   124K: 00760000 - End               : NXM

Table suboption? XBUF

  Extended buffer address range is? 40K-54K
```

Note that DEFAULT prints the memory allocation table. Allocate memory to the extended buffer pool using the XBUF memory allocation table suboption.

```
Table suboption? LIST

Memory allocation table:

   0K: 00000000 - 00223777 (   37K) : EXEC
  37K: 00224000 - 00237777 (    3K) : RTS (RSX)
  40K: 00240000 - 00333777 (   15K) : XBUF
  55K: 00334000 - 00757777 (   69K) : USER
 124K: 00760000 - End               : NXM
```

List the memory allocation table to see if you allocated the correct amount of memory to the extended buffer pool.

```
Table suboption? BUFFERS

How many K words of extra buffer space (0K-2K) <0K>? 2K
You have 328 general + 124 FIP small buffers.
Adjusting memory table.

Memory allocation table:

   0K: 00000000 - 00233777 (  39K) : EXEC
  39K: 00234000 - 00247777 (   3K) : RTS (RSX)
  42K: 00250000 - 00343777 (  15K) : XBUF
  57K: 00344000 - 00757777 (  67K) : USER
 124K: 00760000 - End              : NXM


Table suboption? EXIT
```

Allocate memory to accommodate more general and/or FIP small buffers by using the BUFFERS memory allocation table suboption. Refer to the small buffer table printed by SYSBAT.SAV. Note that BUFFERS tells you how many general and FIP small buffers you have. BUFFERS also automatically prints the memory allocation table.

```
You currently have crash dump enabled.

Crash dump? YES

Magtape labelling default <none>? DOS

Preferred clock <P 100>?

Date format <ALPHABETIC>?

Time format <AM/PM>?

Power fail delay <300>? 60
```

Continue establishing RSTS/E monitor defaults.

```
Option: REFRESH

21-Jan-83?
06:57 AM?

Disk? DM
Unit? 0

Rebuild? NO

  REFRESH suboption? LIST

  File                  File           Current  Minimum    Start
  Name      Required?   Flags  Status   Size     Size       LBN

System files:

  SWAP   .SYS   YES    NOD CTG    OK      3456      256     14001
  SWAP0  .SYS   NO                OK
  SWAP1  .SYS   NO                OK
  SWAP3  .SYS   NO                OK
  OVR    .SYS   NO                OK                 80
  ERR    .SYS   NO                OK                 16
  BUFF   .SYS   NO                OK
  CRASH  .SYS   NO     NOD CTG    OK       288      126      1205
```

List file status table for system disk.

Note the minimum size column.

```
Others:

  BADB  .SYS              NOD          0
  SATT  .SYS          NOD CTG          2                 13541
  INIT  .SYS          NOD CTG        535                   241
  ERR   .ERR          NOD CTG         16                   777
  SYSGEN.SIL              CTG        391                   793
  RT11  .RTS              CTG         20                  1185
  TECO  .RTS              CTG         39                  2077
  RSTS80.SIL          NOD CTG        371                  7309
  BASIC .RTS              CTG         69                  8281
  RSX   .RTS          NOD CTG         16                  8353
```

List file status table for system disk (continued).

```
  REFRESH suboption? CHANGE

  SWAP.SYS changes? NO

  SWAP0.SYS changes? NO

  SWAP1.SYS changes? NO

  SWAP3.SYS changes? NO

  OVR.SYS changes? NO

  ERR.SYS changes? NO

  BUFF.SYS changes? NO

  CRASH.SYS changes? YES

    Delete? NO

    Size? 200

    Base?

  Other files? NO
```

Reduce the size of any system files on the system disk. In the sample installation, CRASH.SYS is reduced from 288 blocks to 200 blocks.

```
  REFRESH suboption? LIST

  File                   File         Current  Minimum    Start
  Name      Required?   Flags Status    Size     Size      LBN

System files:

  SWAP  .SYS   YES    NOD CTG   OK      3456      256     14001
  SWAP0 .SYS    NO              OK
  SWAP1 .SYS    NO              OK
  SWAP3 .SYS    NO              OK
  OVR   .SYS    NO              OK                 80
  ERR   .SYS    NO              OK                 16
  BUFF  .SYS    NO              OK
  CRASH .SYS    NO    NOD CTG   OK       200      126      1205
```

List the file status table for the system disk again. Note that CRASH.SYS is now 200 blocks.

List the file status table for the system disk again (continued).

```
Others:

  BADB   .SYS          NOD          0
  SATT   .SYS      NOD CTG          2                13541
  INIT   .SYS      NOD CTG        535                  241
  ERR    .ERR      NOD CTG         16                  777
  SYSGEN.SIL           CTG        391                  793
  RT11   .RTS          CTG         20                 1185
  TECO   .RTS          CTG         39                 2077
  RSTS80.SIL       NOD CTG        371                 7309
  BASIC  .RTS          CTG         69                 8281
  RSX    .RTS      NOD CTG         16                 8353

  REFRESH suboption? EXIT
```

List the file status table for any nonsystem disks.

```
Option: REFRESH

21-Jan-83?
07:00 AM?

Disk? DM
Unit? 1

Rebuild? NO

  REFRESH suboption? LIST
```

Note the minimum size column.

```
  File                    File          Current  Minimum    Start
  Name         Required?  Flags Status   Size     Size       LBN

System files:

  SWAP   .SYS     NO                OK
  SWAP0  .SYS     NO   NOD CTG      OK     1920              14001
  SWAP1  .SYS     NO                OK
  SWAP3  .SYS     NO   NOD CTG      OK     1536              15921
  OVR    .SYS     NO   NOD CTG      OK      182       80     11801
  ERR    .SYS     NO   NOD CTG      OK       16       16     11717
  BUFF   .SYS     NO                OK
  CRASH .SYS      NO                OK

Others:

  BADB   .SYS          NOD                  16
  SATT   .SYS      NOD CTG                   2               13541
```

Reduce the sizes of any system files on the nonsystem disk.

```
  REFRESH suboption? CHANGE

  SWAP.SYS changes? NO

  SWAP0.SYS changes? NO

  SWAP1.SYS changes? NO

  SWAP3.SYS changes? NO
```

Reduce the size of any system files on the nonsystem disk (continued).

In the sample installation, OVR.SYS is reduced from 182 blocks to 100 blocks.

```
  OVR.SYS changes? YES

    Delete? NO

    Size? 100

    Base? 11714

  ERR.SYS changes? NO

  BUFF.SYS changes? NO

  CRASH.SYS changes? NO

  Other files? NO

  REFRESH suboption? EXIT
```

Start the RSTS/E monitor.

```
Option: START

You currently have: JOB MAX = 27, SWAP MAX = 32K.

JOB MAX or SWAP MAX changes? NO

Any memory allocation changes? NO

You currently have crash dump enabled.

Crash dump? YES

21-Jan-83?
07:03 AM?

?Can't find file or account
```

Make sure you logically mount any nonsystem disks.

Make sure the RSTS/E update kit is mounted. Run the PATCPY program and answer the questions. Note that the sample installation specifies that the patch files be copied to the nonsystem disk.

```
>MOUNT DM1:WRKDSK
>RUN MM0:$PATCPY
PATCPY  V8.0-03A        RSTS T8.0-04 MY SYSTEM
Enter distribution device/PPN<MM0:[1,2]>:
Enter output device/PPN <SY:[200,200]>: DM1:[200,200]

%Can't find file or account - DM1:[200,200]
Attempt to create account DM1:[200,200] <No>? YES
Account DM1:[200,200] created with your password
Packages to patch? ?
No package named ?
Valid Package names are:


ALL           INIT          SYSGEN        MONITR        BASIC
RJ2780        DECNET        TECO          EXEC          BUILD
BIGPRG        BACKUP        SPLER         DEVTST        DCL
RSX           RT11          RMS           SORT          *STANDARD*
COBOLV4.4     DMS500V2.1    DECAL         DIBOL         DTRV2.4
FORTRAN       F77V4.1       INDENT        3271V2.1
```

```
Packages to patch? ALL
Copying MM0:[1,2]PATCHA.DOC to DM1:[200,200]PATCHA.DOC
Copying MM0:[1,2]PATCPY.BAS to DM1:[200,200]PATCPY.BAS
Copying MM0:[1,2]PATCPY.TSK to DM1:[200,200]PATCPY.TSK
Copying MM0:[1,2]MONITR.CMD to DM1:[200,200]MONITR.CMD
Copying MM0:[1,2]BASIC.CMD to DM1:[200,200]BASIC.CMD
Copying MM0:[1,2]DECNTC.CMD to DM1:[200,200]DECNTC.CMD
Copying MM0:[1,2]RJ2780.CMD to DM1:[200,200]RJ2780.CMD
Copying MM0:[1,2]RSXRTS.CMD to DM1:[200,200]RSXRTS.CMD
Copying MM0:[1,2]INIT.CMD to DM1:[200,200]INIT.CMD
Copying MM0:[1,2]PA0101.001 to DM1:[200,200]PA0101.001
Copying MM0:[1,2]PA0101.002 to DM1:[200,200]PA0101.002
Copying MM0:[1,2]PA0101.003 to DM1:[200,200]PA0101.003
Copying MM0:[1,2]PA0101.004 to DM1:[200,200]PA0101.004
Copying MM0:[1,2]SYSGEN.CMD to DM1:[200,200]SYSGEN.CMD
Copying MM0:[1,2]MONITR.CMD to DM1:[200,200]MONITR.CMD
Copying MM0:[1,2]PA0301.001 to DM1:[200,200]PA0301.001
Copying MM0:[1,2]PA0301.002 to DM1:[200,200]PA0301.002
Copying MM0:[1,2]PA0301.003 to DM1:[200,200]PA0301.003
Copying MM0:[1,2]PA0301.004 to DM1:[200,200]PA0301.004
Copying MM0:[1,2]PA0301.005 to DM1:[200,200]PA0301.005
Copying MM0:[1,2]PA0301.006 to DM1:[200,200]PA0301.006
Copying MM0:[1,2]PA0303.001 to DM1:[200,200]PA0303.001
Copying MM0:[1,2]PA0303.002 to DM1:[200,200]PA0303.002
Copying MM0:[1,2]PA0303.003 to DM1:[200,200]PA0303.003
Copying MM0:[1,2]PA0303.004 to DM1:[200,200]PA0303.004
Copying MM0:[1,2]PA0303.005 to DM1:[200,200]PA0303.005
Copying MM0:[1,2]PA0303.006 to DM1:[200,200]PA0303.006
Copying MM0:[1,2]PA0303.007 to DM1:[200,200]PA0303.007
Copying MM0:[1,2]PA0303.033 to DM1:[200,200]PA0303.033
Copying MM0:[1,2]PA0305.001 to DM1:[200,200]PA0305.001
Copying MM0:[1,2]PA0305.002 to DM1:[200,200]PA0305.002
Copying MM0:[1,2]PA0305.003 to DM1:[200,200]PA0305.003
Copying MM0:[1,2]PA0305.004 to DM1:[200,200]PA0305.004
Copying MM0:[1,2]PA0305.005 to DM1:[200,200]PA0305.005
Copying MM0:[1,2]PA0305.006 to DM1:[200,200]PA0305.006
Copying MM0:[1,2]PA0305.007 to DM1:[200,200]PA0305.007
Copying MM0:[1,2]PA0305.008 to DM1:[200,200]PA0305.008
Copying MM0:[1,2]PA0305.009 to DM1:[200,200]PA0305.009
Copying MM0:[1,2]PA0305.010 to DM1:[200,200]PA0305.010
Copying MM0:[1,2]PA0305.011 to DM1:[200,200]PA0305.011
Copying MM0:[1,2]PA0307.001 to DM1:[200,200]PA0307.001
Copying MM0:[1,2]PA0307.002 to DM1:[200,200]PA0307.002
Copying MM0:[1,2]PA0307.003 to DM1:[200,200]PA0307.003
Copying MM0:[1,2]PA0307.004 to DM1:[200,200]PA0307.004
Copying MM0:[1,2]BASIC.CMD to DM1:[200,200]BASIC.CMD
Copying MM0:[1,2]PA0401.001 to DM1:[200,200]PA0401.001
Copying MM0:[1,2]PA0401.002 to DM1:[200,200]PA0401.002
Copying MM0:[1,2]PA0401.003 to DM1:[200,200]PA0401.003
Copying MM0:[1,2]PA0401.004 to DM1:[200,200]PA0401.004
Copying MM0:[1,2]PA0401.005 to DM1:[200,200]PA0401.005
Copying MM0:[1,2]PA0401.006 to DM1:[200,200]PA0401.006
Copying MM0:[1,2]PA0401.007 to DM1:[200,200]PA0401.007
Copying MM0:[1,2]PA0401.008 to DM1:[200,200]PA0401.008
Copying MM0:[1,2]PA0401.009 to DM1:[200,200]PA0401.009
Copying MM0:[1,2]PA0410.003 to DM1:[200,200]PA0410.003
Copying MM0:[1,2]PA0410.004 to DM1:[200,200]PA0410.004
```

PATCPY prints the names of the files it is copying.

PATCPY output (continued).

```
Copying MM0:[1,2]PA0410.005 to DM1:[200,200]PA0410.005
Copying MM0:[1,2]PA0410.006 to DM1:[200,200]PA0410.006
Copying MM0:[1,2]DECNTC.CMD to DM1:[200,200]DECNTC.CMD
Copying MM0:[1,2]RJ2780.CMD to DM1:[200,200]RJ2780.CMD
Copying MM0:[1,2]UT2780.CMD to DM1:[200,200]UT2780.CMD
Copying MM0:[1,2]PA2502.CMD to DM1:[200,200]PA2502.CMD
Copying MM0:[1,2]PA2502.001 to DM1:[200,200]PA2502.001
Copying MM0:[1,2]PA2502.002 to DM1:[200,200]PA2502.002
Copying MM0:[1,2]RSXRTS.CMD to DM1:[200,200]RSXRTS.CMD
Copying MM0:[1,2]RSX.CMD to DM1:[200,200]RSX.CMD
Copying MM0:[1,2]PA2103.001 to DM1:[200,200]PA2103.001
Copying MM0:[1,2]PA2103.002 to DM1:[200,200]PA2103.002
Copying MM0:[1,2]PA2103.003 to DM1:[200,200]PA2103.003
Copying MM0:[1,2]PA2103.004 to DM1:[200,200]PA2103.004
Copying MM0:[1,2]PA2103.005 to DM1:[200,200]PA2103.005
Copying MM0:[1,2]RT11.CMD to DM1:[200,200]RT11.CMD
Copying MM0:[1,2]PA2218.SAV to DM1:[200,200]PA2218.SAV
Copying MM0:[1,2]PA2213.001 to DM1:[200,200]PA2213.001
Copying MM0:[1,2]PA2213.002 to DM1:[200,200]PA2213.002
Copying MM0:[1,2]PA2213.003 to DM1:[200,200]PA2213.003
Copying MM0:[1,2]PA2213.004 to DM1:[200,200]PA2213.004
Copying MM0:[1,2]PA2213.005 to DM1:[200,200]PA2213.005
Copying MM0:[1,2]PA2213.006 to DM1:[200,200]PA2213.006
Copying MM0:[1,2]PA2219.001 to DM1:[200,200]PA2219.001
Copying MM0:[1,2]PA2219.002 to DM1:[200,200]PA2219.002
Copying MM0:[1,2]PA2219.003 to DM1:[200,200]PA2219.003
Copying MM0:[1,2]EXEC.CMD to DM1:[200,200]EXEC.CMD
Copying MM0:[1,2]PA1003.001 to DM1:[200,200]PA1003.001
Copying MM0:[1,2]PA1012.002 to DM1:[200,200]PA1012.002
Copying MM0:[1,2]PA1012.003 to DM1:[200,200]PA1012.003
Copying MM0:[1,2]PA1012.004 to DM1:[200,200]PA1012.004
Copying MM0:[1,2]PA1012.005 to DM1:[200,200]PA1012.005
Copying MM0:[1,2]PA1012.006 to DM1:[200,200]PA1012.006
Copying MM0:[1,2]PA1012.007 to DM1:[200,200]PA1012.007
Copying MM0:[1,2]PA1012.008 to DM1:[200,200]PA1012.008
Copying MM0:[1,2]PA1021.001 to DM1:[200,200]PA1021.001
Copying MM0:[1,2]PA1707.002 to DM1:[200,200]PA1707.002
Copying MM0:[1,2]PA1707.003 to DM1:[200,200]PA1707.003
Copying MM0:[1,2]PA1404.001 to DM1:[200,200]PA1404.001
Copying MM0:[1,2]PA1406.001 to DM1:[200,200]PA1406.001
Copying MM0:[1,2]PA1406.002 to DM1:[200,200]PA1406.002
Copying MM0:[1,2]PA1406.003 to DM1:[200,200]PA1406.003
Copying MM0:[1,2]PA1410.001 to DM1:[200,200]PA1410.001
Copying MM0:[1,2]PA1415.001 to DM1:[200,200]PA1415.001
Copying MM0:[1,2]BIGPRG.CMD to DM1:[200,200]BIGPRG.CMD
Copying MM0:[1,2]PA1114.CMD to DM1:[200,200]PA1114.CMD
Copying MM0:[1,2]DSKCVT.BAS to DM1:[200,200]DSKCVT.BAS
Copying MM0:[1,2]DSKCVT.TSK to DM1:[200,200]DSKCVT.TSK
Copying MM0:[1,2]PA1305.001 to DM1:[200,200]PA1305.001
Copying MM0:[1,2]PA2002.001 to DM1:[200,200]PA2002.001
Copying MM0:[1,2]PA2002.002 to DM1:[200,200]PA2002.002
Copying MM0:[1,2]PA2002.003 to DM1:[200,200]PA2002.003
Copying MM0:[1,2]PA2002.004 to DM1:[200,200]PA2002.004
Copying MM0:[1,2]PA2002.005 to DM1:[200,200]PA2002.005
Copying MM0:[1,2]PA2002.006 to DM1:[200,200]PA2002.006
Copying MM0:[1,2]PA2002.007 to DM1:[200,200]PA2002.007
Copying MM0:[1,2]DECNTC.CMD to DM1:[200,200]DECNTC.CMD
```

```
Copying MM0:[1,2]DECNET.CMD to DM1:[200,200]DECNET.CMD
Copying MM0:[1,2]PA3120.CMD to DM1:[200,200]PA3120.CMD
Copying MM0:[1,2]PA3120.OLB to DM1:[200,200]PA3120.OLB
Copying MM0:[1,2]PA3103.CMD to DM1:[200,200]PA3103.CMD
Copying MM0:[1,2]PA3103.001 to DM1:[200,200]PA3103.001
Copying MM0:[1,2]PA3103.002 to DM1:[200,200]PA3103.002
Copying MM0:[1,2]PA3103.003 to DM1:[200,200]PA3103.003
Copying MM0:[1,2]PA3103.004 to DM1:[200,200]PA3103.004
Copying MM0:[1,2]PA3110.CMD to DM1:[200,200]PA3110.CMD
Copying MM0:[1,2]PA3108.001 to DM1:[200,200]PA3108.001
Copying MM0:[1,2]PA3119.CMD to DM1:[200,200]PA3119.CMD
Copying MM0:[1,2]PA3119.001 to DM1:[200,200]PA3119.001
Copying MM0:[1,2]PA3119.002 to DM1:[200,200]PA3119.002
Copying MM0:[1,2]PA3121.CMD to DM1:[200,200]PA3121.CMD
Copying MM0:[1,2]PA3121.001 to DM1:[200,200]PA3121.001
Copying MM0:[1,2]PA3121.002 to DM1:[200,200]PA3121.002
Copying MM0:[1,2]PA3121.003 to DM1:[200,200]PA3121.003
Copying MM0:[1,2]PA3123.CMD to DM1:[200,200]PA3123.CMD
Copying MM0:[1,2]PA3123.001 to DM1:[200,200]PA3123.001
Copying MM0:[1,2]PA3123.002 to DM1:[200,200]PA3123.002
Copying MM0:[1,2]3271.CMD to DM1:[200,200]3271.CMD
Copying MM0:[1,2]D3270.NEW to DM1:[200,200]D3270.NEW
Copying MM0:[1,2]DMSDBL.CMD to DM1:[200,200]DMSDBL.CMD
Copying MM0:[1,2]RMSDBL.CMD to DM1:[200,200]RMSDBL.CMD
Copying MM0:[1,2]DECFM.OBJ to DM1:[200,200]DECFM.OBJ
Copying MM0:[1,2]DECFMR.OBJ to DM1:[200,200]DECFMR.OBJ
Copying MM0:[1,2]PA2606.CMD to DM1:[200,200]PA2606.CMD
Copying MM0:[1,2]PA2606.003 to DM1:[200,200]PA2606.003
Copying MM0:[1,2]PA2606.004 to DM1:[200,200]PA2606.004
Copying MM0:[1,2]PA2607.CMD to DM1:[200,200]PA2607.CMD
Copying MM0:[1,2]PA2607.001 to DM1:[200,200]PA2607.001
Copying MM0:[1,2]PA2608.CMD to DM1:[200,200]PA2608.CMD
Copying MM0:[1,2]PA2608.001 to DM1:[200,200]PA2608.001
Copying MM0:[1,2]PA2618.CMD to DM1:[200,200]PA2618.CMD
Copying MM0:[1,2]PA2641.CMD to DM1:[200,200]PA2641.CMD
Copying MM0:[1,2]PA2641.001 to DM1:[200,200]PA2641.001
Copying MM0:[1,2]PA2641.002 to DM1:[200,200]PA2641.002
Copying MM0:[1,2]PA2642.CMD to DM1:[200,200]PA2642.CMD
Copying MM0:[1,2]PA2642.001 to DM1:[200,200]PA2642.001
Copying MM0:[1,2]PA2659.CMD to DM1:[200,200]PA2659.CMD
Copying MM0:[1,2]PA2670.CMD to DM1:[200,200]PA2670.CMD
Copying MM0:[1,2]PA2670.001 to DM1:[200,200]PA2670.001
Copying MM0:[1,2]PA2670.002 to DM1:[200,200]PA2670.002
Copying MM0:[1,2]PA2670.003 to DM1:[200,200]PA2670.003
Copying MM0:[1,2]PA2670.004 to DM1:[200,200]PA2670.004
Copying MM0:[1,2]PA7114.CMD to DM1:[200,200]PA7114.CMD
Copying MM0:[1,2]PA7116.CMD to DM1:[200,200]PA7116.CMD
Copying MM0:[1,2]PA7117.CMD to DM1:[200,200]PA7117.CMD
Copying MM0:[1,2]PA7118.CMD to DM1:[200,200]PA7118.CMD
Copying MM0:[1,2]INDENT.CMD to DM1:[200,200]INDENT.CMD
Copying MM0:[1,2]INDENT.V01 to DM1:[200,200]INDENT.V01
Copying MM0:[1,2]PA2802.CMD to DM1:[200,200]PA2802.CMD
Copying MM0:[1,2]PA2802.001 to DM1:[200,200]PA2802.001
Copying MM0:[1,2]PA2803.CMD to DM1:[200,200]PA2803.CMD
Copying MM0:[1,2]PA2803.001 to DM1:[200,200]PA2803.001
Copying MM0:[1,2]PA2803.002 to DM1:[200,200]PA2803.002
Copying MM0:[1,2]PA2803.003 to DM1:[200,200]PA2803.003
Copying MM0:[1,2]PA2804.CMD to DM1:[200,200]PA2804.CMD
```

PATCPY output (continued).

```
Copying MMO:[1,2]PA2804.001 to DM1:[200,200]PA2804.001
Copying MMO:[1,2]PA2804.002 to DM1:[200,200]PA2804.002
Copying MMO:[1,2]PA2804.003 to DM1:[200,200]PA2804.003
Copying MMO:[1,2]COBOL.V44 to DM1:[200,200]COBOL.V44
Copying MMO:[1,2]COBOL.CIS to DM1:[200,200]COBOL.CIS
Copying MMO:[1,2]COBOL.COB to DM1:[200,200]COBOL.COB
Copying MMO:[1,2]PA7002.CMD to DM1:[200,200]PA7002.CMD
Copying MMO:[1,2]PA7002.001 to DM1:[200,200]PA7002.001
Copying MMO:[1,2]PA7003.CMD to DM1:[200,200]PA7003.CMD
Copying MMO:[1,2]PA7003.001 to DM1:[200,200]PA7003.001
Copying MMO:[1,2]FORTRA.V25 to DM1:[200,200]FORTRA.V25
Copying MMO:[1,2]PA6302.CMD to DM1:[200,200]PA6302.CMD
Copying MMO:[1,2]PA6302.001 to DM1:[200,200]PA6302.001
Copying MMO:[1,2]PA6302.002 to DM1:[200,200]PA6302.002
Copying MMO:[1,2]PA6302.003 to DM1:[200,200]PA6302.003
Copying MMO:[1,2]PA6302.004 to DM1:[200,200]PA6302.004
Copying MMO:[1,2]PA6302.005 to DM1:[200,200]PA6302.005
Copying MMO:[1,2]PA6302.006 to DM1:[200,200]PA6302.006
Copying MMO:[1,2]PA6302.007 to DM1:[200,200]PA6302.007
Copying MMO:[1,2]PA6302.008 to DM1:[200,200]PA6302.008
Copying MMO:[1,2]PA6302.009 to DM1:[200,200]PA6302.009
Copying MMO:[1,2]PA6302.010 to DM1:[200,200]PA6302.010
Copying MMO:[1,2]PA6302.011 to DM1:[200,200]PA6302.011
Copying MMO:[1,2]PA6302.012 to DM1:[200,200]PA6302.012
Copying MMO:[1,2]PA6303.CMD to DM1:[200,200]PA6303.CMD
Copying MMO:[1,2]PA6303.001 to DM1:[200,200]PA6303.001
Copying MMO:[1,2]PA6303.002 to DM1:[200,200]PA6303.002
Copying MMO:[1,2]PA6303.003 to DM1:[200,200]PA6303.003
Copying MMO:[1,2]PA6303.004 to DM1:[200,200]PA6303.004
Copying MMO:[1,2]PA6303.005 to DM1:[200,200]PA6303.005
Copying MMO:[1,2]PA6303.006 to DM1:[200,200]PA6303.006
Copying MMO:[1,2]PA6303.007 to DM1:[200,200]PA6303.007
Copying MMO:[1,2]PA6303.008 to DM1:[200,200]PA6303.008
Copying MMO:[1,2]PA6303.009 to DM1:[200,200]PA6303.009
Copying MMO:[1,2]PA6303.010 to DM1:[200,200]PA6303.010
Copying MMO:[1,2]RMS11M.ODL to DM1:[200,200]RMS11M.ODL
Copying MMO:[1,2]DTR.V24 to DM1:[200,200]DTR.V24
Copying MMO:[1,2]DTRSTS.TKB to DM1:[200,200]DTRSTS.TKB
Copying MMO:[1,2]PA6802.001 to DM1:[200,200]PA6802.001
Copying MMO:[1,2]PA6802.002 to DM1:[200,200]PA6802.002
Copying MMO:[1,2]PA6802.003 to DM1:[200,200]PA6802.003
Copying MMO:[1,2]PA6802.004 to DM1:[200,200]PA6802.004
Copying MMO:[1,2]PA6802.005 to DM1:[200,200]PA6802.005
Copying MMO:[1,2]PA6802.006 to DM1:[200,200]PA6802.006
Copying MMO:[1,2]PA6802.007 to DM1:[200,200]PA6802.007
Copying MMO:[1,2]PA6802.008 to DM1:[200,200]PA6802.008
Copying MMO:[1,2]PA6802.009 to DM1:[200,200]PA6802.009
Copying MMO:[1,2]PA6802.010 to DM1:[200,200]PA6802.010
Copying MMO:[1,2]PA6802.011 to DM1:[200,200]PA6802.011
Copying MMO:[1,2]PA6802.013 to DM1:[200,200]PA6802.013
Copying MMO:[1,2]PA6802.998 to DM1:[200,200]PA6802.998
Copying MMO:[1,2]PA6802.999 to DM1:[200,200]PA6802.999
Copying MMO:[1,2]DECAL.BLD to DM1:[200,200]DECAL.BLD
Copying MMO:[1,2]DECAL.CMD to DM1:[200,200]DECAL.CMD
Copying MMO:[1,2]PA3702.CMD to DM1:[200,200]PA3702.CMD
Copying MMO:[1,2]PA3702.001 to DM1:[200,200]PA3702.001
Copying MMO:[1,2]PA3702.002 to DM1:[200,200]PA3702.002
```

PATCPY output (continued).

```
Copying MM0:[1,2]PA3702.003 to DM1:[200,200]PA3702.003
Copying MM0:[1,2]PA3703.CMD to DM1:[200,200]PA3703.CMD
Copying MM0:[1,2]PA3703.C01 to DM1:[200,200]PA3703.C01
Copying MM0:[1,2]PA3703.C02 to DM1:[200,200]PA3703.C02
Copying MM0:[1,2]PA3703.L01 to DM1:[200,200]PA3703.L01
Copying MM0:[1,2]PA3703.L02 to DM1:[200,200]PA3703.L02
Copying MM0:[1,2]PA3704.CMD to DM1:[200,200]PA3704.CMD
Copying MM0:[1,2]PA3704.001 to DM1:[200,200]PA3704.001
 236 files copied
Copy operation complete
```

PATCPY output (continued).

PATCPY is finished copying patch files and replacement modules.

```
>RUN MM0:$BUILD
BUILD  V8.0-04  RSTS T8.0-04 MY SYSTEM
System Build <No> ?
Source Input Device <MM0:> ?
Library Output Device <SY:> ?
Target System Device <SY0:> ?
Library Account <[1,2]> ?
Control File is ? RSX

*** Copying file MM0:[1,2]RSX.CTL to BLD01.TMP ***
```

Build the RSX run-time system (only if your primary run-time system is RSX).

```
Locate logical 'LB:' on <SY:[1,1]> ? DM1:[1,1]
Function (Build/Patch, Patch, Build) <Build/Patch> ?
Patch file input location <SY:[200,200]> ? DM1:[200,200]
Save patched sources <No> ?
Additional Control File is <None> ? BUILD

*** Copying file MM0:[1,2]BUILD.CTL/MO:2 to BLD01.TMP ***
```

Note that the sample installation indicates LB: will be stored in account [1,1] of the nonsystem disk.

Build the system programs associated with the BUILD.CTL control file. See Chapter 3 of the RSTS/E Release Notes for the order in which you should process these control files.

```
Run-Time System <RSX> ?
Use CSPCOM <YES> ?
Locate ERROR Package on <SY:[1,2]> ? DM1:[2,3]
```

The sample installation uses the prebuilt system programs

```
%?Can't find file or account - DM1:[2,3]
Create account DM1:[2,3] <No>? YES
Account DM1:[2,3] created with your password
Additional Control File is <None> ? BIGPRG

*** Copying file MM0:[1,2]BIGPRG.CTL/MO:2 to BLD01.TMP ***
```

Build the system programs associated with the BIGPRG.CTL control file.

```
Additional Control File is <None> ? DCL

*** Copying file MM0:[1,2]DCL.CTL/MO:2 to BLD01.TMP ***
```

Build DCL run-time system.

```
Include support for the new spooling package <NO> ?
Additional Control File is <None> ? HELP

*** Copying file MM0:[1,2]HELP.CTL/MO:2 to BLD01.TMP ***

Locate HELP Package on <SY:[1,2]> ? DM1:[2,4]
```

Build the HELP package.

```
%?Can't find file or account - DM1:[2,4]
Create account DM1:[2,4] <No>? YES
Account DM1:[2,4] created with your password
Additional Control File is <None> ? EDT

*** Copying file MM0:[1,2]EDT.CTL/MO:2 to BLD01.TMP ***
```

Build EDT.

```
Type 'BLD' for normal configuration
Type 'OVB' for overlaid configuration
Type 'SHR' for sharable (multi-user) configuration

Please specify the 3-character configuration code <BLD> ?
Additional Control File is <None> ? SPLER
```

Build the standard RSTS/E Spooling Package.

```
*** Copying file MM0:[1,2]SPLER.CTL/MO:2 to BLD01.TMP ***

Locate SPOOLING Package on <SY:[1,2]> ? DM1:[2,5]

%?Can't find file or account - DM1:[2,5]
Create account DM1:[2,5] <No>? YES
Account DM1:[2,5] created with your password
Additional Control File is <None> ? BACKUP

*** Copying file MM0:[1,2]BACKUP.CTL/MO:2 to BLD01.TMP ***

Locate BACKUP Package on <SY:[1,2]> ? DM1:2,6]
?Illegal file name - DM1:2,6]
Locate BACKUP Package on <SY:[1,2]> ? DM1:[2,6]
```

Build the BACKUP Package.

(Your installation may process some, all, or more of these control files.)

```
%?Can't find file or account - DM1:[2,6]
Create account DM1:[2,6] <No>? YES
Account DM1:[2,6] created with your password
Additional Control File is <None> ?

!*** Processing started on 21-Jan-83 at 07:26 AM ***
>ASSIGN MM0:/MO:1
>ASSIGN SY0:SYSDSK
>ASSIGN SY:SYSTEM
>ASSIGN [1,2]
>ASSIGN MM0:INPUT
>!
! BUILD PROCEDURE FOR RSX RUN-TIME SYSTEM AND UTILITIES
!
! Copyright (C) 1979, 1981, 1982, 1983
! by Digital Equipment Corporation, Maynard, Mass.

>!
! MAKE SURE RT11 RUN-TIME SYSTEM IS ADDED
!
RUN SY:[1,2]UTILTY
*ADD RT11
?Name or account now exists
*EXIT
>
>!
! COPY RUN-TIME SYSTEM FROM DISTRIBUTION KIT
!
! NOTE THAT PROTECTION VIOLATION ERRORS WILL OCCUR
! IF RSX IS YOUR SYSTEM DEFAULT RUN-TIME SYSTEM
```

BUILD output.

```
!
RUN SY:[1,2]PIP.SAV
*SY0:[0,1]RSX.RTS/DE:NOWARN
?Protection violation - file SY0:[0,1]RSX    .RTS
*SY0:[0,1]RSX.RTS/PR:NOWARN=MM0:[1,2]RSX.RTS/RW:NO
*SY0:[0,1]/CL:16/MODE:16=SY0:[0,1]RSX.RTS
?Protection violation - file SY0:[0,1]RSX    .RTS - continuing
*^Z
>
>!
! ADD THE RUN-TIME SYSTEM
!
RUN SY:[1,2]UTILTY
*REMOVE RSX
?Protection violation
*ADD SY0:RSX
?Name or account now exists
*EXIT
>
>!
! COPY SYSTEM LIBRARIES AND PROGRAMS TO TARGET SYSTEM
!
RUN SY:[1,2]PIP.SAV
*LB:<40>/RTS:RSX=MM0:[1,2]SYSLIB.OLB/BL
*LB:<40>/RTS:RSX=MM0:[1,2]RSXMAC.SML/BL
*LB:<40>/RTS:RSX=MM0:[1,2]CSPCOM.OLB/BL
*SY:[1,2]<104>/RTS:RSX=MM0:[1,2]TKB.TSK/BL
*SY:[1,2]<104>/RTS:RSX=MM0:[1,2]STK.TSK/BL
*SY:[1,2]<104>/RTS:RSX=MM0:[1,2]MAC.TSK/BL
*SY:[1,2]<104>/RTS:RSX=MM0:[1,2]LBR.TSK/BL
*SY:[1,2]<104>/RTS:RSX=MM0:[1,2]PAT.TSK/BL
*SY:[1,2]<124>/RTS:RSX=MM0:[1,2]CSPCOM.TSK/BL
*SY:[1,2]<124>/RTS:RSX=MM0:[1,2]SHUTUP.RSX/BL
*SY:[1,2]<124>/RTS:RSX=MM0:[1,2]MAKSIL.TSK/BL
*^Z
>
>!
! ADD THE FOLLOWING UTILTY COMMANDS TO SYSTEM START-UP FILE
!
!
RUN SY:[1,2]UTILTY
*CCL TKB=SY:[1,2]TKB.TSK
*CCL MAC=SY:[1,2]MAC.TSK
*CCL LBR=SY:[1,2]LBR.TSK
*CCL PAT=SY:[1,2]PAT.TSK
*EXIT
>
>!
! EXTRACT ODT.OBJ FROM SYSLIB
!
LBR LB:ODT.OBJ=LB:SYSLIB/EX:ODTRSX
>RUN SY:[1,2]PIP.SAV
*LB:ODT.OBJ<40>/RE
*^Z
>
>
>!
```

BUILD output (continued).

BUILD output (continued).

```
>!
! AUTO-PATCH PROCEDURE FOR RSX
!
!       SEQ 21.3. M, JANUARY 1983 FIELD TEST
!
!       ATTACH TO R/W CLUSTER LIBRARIES PROPERLY
!       MANDATORY PATCH
!       COPYRIGHT (C) 1983 DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
!
RUN SY:[1,2]ONLPAT.SAV
Command file name? DM1:[200,200]RSXRTS.CMD
!
!       RSXRTS.CMD
!
!       Seq 21.3, January 1983 Field Test
!       RSX Emulator Package
!       RSX.RTS
! COPYRIGHT (C) 1983 BY DIGITAL EQUIPMENT CORP., Maynard, MASS.
!
!
!       SEQ 21.3. M, JANUARY 1983 FIELD TEST
!
!       ATTACH TO R/W CLUSTER LIBRARIES PROPERLY
!       MANDATORY PATCH
!       COPYRIGHT (C) 1983 DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
!
File to patch? [0,1]RSX.RTS
File found in account [0,1]
Base address? ..RUN


Offset address? 1574
 Base   Offset  Old     New?
174416  001574  004737  ? Old<>016014 4737
174416  001576  177106  ? Old<>000024 PATCH
174416  001600  052714  ? ^Z
Offset address? ^Z
Base address? PATCH
Offset address? 0
 Base   Offset  Old     New?
177106  000000  012714  ? Old<>000000 12714
177106  000002  000001  ? Old<>000000 1
177106  000004  005760  ? Old<>000000 5760
177106  000006  000024  ? Old<>000000 24
177106  000010  100002  ? Old<>000000 100002
177106  000012  012714  ? Old<>000000 12714
177106  000014  000002  ? Old<>000000 2
177106  000016  011460  ? Old<>000000 11460
177106  000020  000024  ? Old<>000000 24
177106  000022  000207  ? Old<>000000 207
177106  000024  000000  ? ^C
Patch complete - no modifications made
```

BUILD output (continued).

```
0 patches installed
1 patch skipped

Command file name? ^Z
>
>!
! END OF BUILD PROCEDURE FOR RSX
!

>
>!********** BUILD.CTL - STANDARD LIBRARY PROGRAMS
! Copyright (C) 1979, 1981, 1982, 1983
! by Digital Equipment Corporation, Maynard, Mass.

>
>
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]CPATCH.TSK/RTS:RSX=MM0:[1,2]CPATCH.TSK/RW:NO
*^Z
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]AUTOED.TSK/RTS:RSX=MM0:[1,2]AUTOED.TSK/RW:NO
*^Z
>
>
>
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]BUILD.TSK/RTS:RSX=MM0:[1,2]BUILD.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY0:[1,2]ATPK.TSK<252>/RTS:RSX=MM0:[1,2]ATPK.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY0:[1,2]LOGIN.TSK<232>/RTS:RSX=MM0:[1,2]LOGIN.TSK/RW:NO
*^Z
>
>
>RUN SY:[1,2]PIP.SAV
*SY0:[1,2]LOGOUT.TSK<232>/RTS:RSX=MM0:[1,2]LOGOUT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]PATCPY.TSK/RTS:RSX=MM0:[1,2]PATCPY.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]PBUILD.TSK/RTS:RSX=MM0:[1,2]PBUILD.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY0:[1,2]UTILTY.TSK/RTS:RSX=MM0:[1,2]UTILTY.TSK/RW:NO
*^Z
```

```
>
>RUN SY:[1,2]PIP.SAV
*SY0:[1,2]INIT.TSK/RTS:RSX=MM0:[1,2]INIT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY0:[1,2]SHUTUP.TSK/RTS:RSX=MM0:[1,2]SHUTUP.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ERRBLD.TSK/RTS:RSX=MM0:[1,2]ERRBLD.TSK/RW:NO
*^Z
>RUN DM1:[2,3]ERRBLD
ERRBLD  V8.0-04 RSTS T8.0-04 MY SYSTEM
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ERRINT.TSK/RTS:RSX=MM0:[1,2]ERRINT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ERRCPY.TSK/RTS:RSX=MM0:[1,2]ERRCPY.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]DIRECT.TSK<232>/RTS:RSX=MM0:[1,2]DIRECT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]TTYSET.TSK<104>/RTS:RSX=MM0:[1,2]TTYSET.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]SYSTAT.TSK<232>/RTS:RSX=MM0:[1,2]SYSTAT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ERRDIS.TSK/RTS:RSX=MM0:[1,2]ERRDIS.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ERRDET.TSK/RTS:RSX=MM0:[1,2]ERRDET.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ANALYS.TSK/RTS:RSX=MM0:[1,2]ANALYS.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ANALY1.TSK/RTS:RSX=MM0:[1,2]ANALY1.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ANALY2.TSK/RTS:RSX=MM0:[1,2]ANALY2.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,3]ANALY3.TSK/RTS:RSX=MM0:[1,2]ANALY3.TSK/RW:NO
*^Z
```

BUILD output (continued).

BUILD output (continued).

```
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]REACT.TSK/RTS:RSX=MM0:[1,2]REACT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]UMOUNT.TSK<232>/RTS:RSX=MM0:[1,2]UMOUNT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]FILCOM.TSK<104>/RTS:RSX=MM0:[1,2]FILCOM.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]PLEASE.TSK<232>/RTS:RSX=MM0:[1,2]PLEASE.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]SWITCH.TSK<232>/RTS:RSX=MM0:[1,2]SWITCH.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]MAKSIL.TSK/RTS:RSX=MM0:[1,2]MAKSIL.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]NOTICE.TXT<40> /PR:NOWARN=MM0:[1,2]NOTICE.TXT/AS/NO
*SY:[1,2]HELP  .TXT<40> /PR:NOWARN=MM0:[1,2]HELP  .TXT/AS/NO
*SY:[1,2]START.TMP=KB:
@SY0:[1,2]RTS.CMD
@SY0:[1,2]TTY.CMD
;@SPOOL.CMD[1,2]
@SY0:[1,2]CCL.CMD
DETACH
LOGIN KB0: [1,2]
FORCE KB0: RUN SY:[1,2]UTILTY
FORCE KB0: REMOVE LOGICAL LB
FORCE KB0: ADD LOGICAL DM1:[1,1]LB
FORCE KB0: EXIT
FORCE KB0: BYE/F
ATTACH
FORCE KB0: RUN DM1:[2,3]ERRINT
FORCE KB0: 100
FORCE KB0: NO
LOGINS
SEND RSTS/E IS NOW ON THE AIR...
END
^Z
*SY0:[1,2]START .CTL    /PR:NOWARN=SY:[1,2]START.TMP/AS
*SY:[1,2]START .TMP     /DE:NOWARN
*SY0:[1,2]TTY   .CMD    /PR:NOWARN=MM0:[1,2]TTY   .CMD/AS/NO
*SY0:[1,2]RTS   .CMD    /PR:NOWARN=MM0:[1,2]RTS   .CMD/AS/NO
*SY0:[1,2]CCL   .CMD    /PR:NOWARN=MM0:[1,2]CCL   .CMD/AS/NO
*SY:[1,2]CRASH .TMP               =KB:
@SY0:[1,2]RTS.CMD
@SY0:[1,2]ANALYS.CMD
@SY0:[1,2]CLEAN.CMD
@SY0:[1,2]TTY.CMD
;@SPOOL.CMD[1,2]
@SY0:[1,2]CCL.CMD
```

BUILD output (continued).

```
DETACH
LOGIN KBO: [1,2]
FORCE KBO: RUN SY:[1,2]UTILTY
FORCE KBO: REMOVE LOGICAL LB
FORCE KBO: ADD LOGICAL DM1:[1,1]LB
FORCE KBO: EXIT
FORCE KBO: RUN SY:[1,2]QUE
FORCE KBO: Q DM1:[2,3]ANALYS.DMP/DE
FORCE KBO: EXIT
FORCE KBO: BYE/F
ATTACH
FORCE KBO: RUN DM1:[2,3]ERRINT
FORCE KBO: 100
FORCE KBO: YES
LOGINS
SEND RSTS/E IS NOW ON THE AIR...
END
^Z
*SY0:[1,2]CRASH .CTL    /PR:NOWARN=SY:[1,2]CRASH .TMP/AS
*SY:[1,2]CRASH .TMP     /DE:NOWARN
*SY:[1,2]ANALYS.TMP               =KB:
DETACH
LOGIN KBO: [1,2]
FORCE KBO: RUN DM1:[2,3]ANALYS
FORCE KBO: [0,1]CRASH.SYS
FORCE KBO: DM1:[2,3]ANALYS.DMP
FORCE KBO: DM1:[2,3]ERRCRS.FIL
FORCE KBO: BYE/F
ATTACH
^Z
*SY0:[1,2]ANALYS.CMD    /PR:NOWARN=SY:[1,2]ANALYS.TMP/AS/NO
*SY:[1,2]ANALYS.TMP     /DE:NOWARN
*SY0:[1,2]CLEAN .CMD    /PR:NOWARN=MM0:[1,2]CLEAN .CMD/AS/NO
*SY:[1,2]UTILTY.HLP               =MM0:[1,2]UTILTY.HLP/AS/NO
*SY:[1,2]DIRECT.HLP<40>           =MM0:[1,2]DIRECT.HLP/AS/NO
*DM1:[2,3]ERRDIS.HLP              =MM0:[1,2]ERRDIS.HLP/AS/NO
*SY:[1,2]ACCT  .SYS<188>        /PR:NOWARN=MM0:[1,2]ACCT  .SYS/AS/NO
*^Z
>RUN SY:[1,2]UTILTY
UTILTY  V8.0-04 RSTS T8.0-04 MY SYSTEM
#LOGINS
#EXIT
>!********** BIGPRG.CTL - LARGE PROGRAM BUILD
! Copyright (C) 1979, 1981, 1982, 1983
! by Digital Equipment Corporation, Maynard, Mass.

>
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]ODT.TSK/RTS:RSX=MM0:[1,2]ODT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]REORDR.TSK/RTS:RSX=MM0:[1,2]REORDR.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]COPY.TSK<104>/RTS:RSX=MM0:[1,2]COPY.TSK/RW:NO
*^Z
```

BUILD output (continued).

```
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]QUOLST.TSK<232>/RTS:RSX=MM0:[1,2]QUOLST.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]MONEY.TSK<104>/RTS:RSX=MM0:[1,2]MONEY.TSK/RW:NO



*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]GRIPE.TSK<232>/RTS:RSX=MM0:[1,2]GRIPE.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]TALK.TSK<232>/RTS:RSX=MM0:[1,2]TALK.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]VT50PY.TSK<232>/RTS:RSX=MM0:[1,2]VT50PY.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]VT5DPY.TSK<232>/RTS:RSX=MM0:[1,2]VT5DPY.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]FIT.TSK<232>/RTS:RSX=MM0:[1,2]FIT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]FLINT.TSK<104>/RTS:RSX=MM0:[1,2]FLINT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]PMDUMP.TSK<104>/RTS:RSX=MM0:[1,2]PMDUMP.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]BPCREF.TSK<104>/RTS:RSX=MM0:[1,2]BPCREF.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]BPCRF1.TSK<104>/RTS:RSX=MM0:[1,2]BPCRF1.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]RUNOFF.TSK<104>/RTS:RSX=MM0:[1,2]RUNOFF.TSK/RW:NO
*^Z
>
>!
!       PA1114.CMD
!
!       Seq 11.14
!       DSKCVT
! COPYRIGHT (C) 1983 BY DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
```

BUILD output (continued).

```
!
! Replace DSKCVT (Seq 11.14)
!
RUN SY:[1,2]PIP.SAV
*SY:[1,2]DSKCVT.TSK/RTS:RSX=DM1:[200,200]DSKCVT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]DSKINT.TSK<124>=MM0:[1,2]DSKINT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]COPY  .HLP<40>=MM0:[1,2]COPY  .HLP/AS/RW:NO
*SY:[1,2]BPCREF.HLP<40>=MM0:[1,2]BPCREF.HLP/AS/RW:NO
*SY:[1,2]FIT   .HLP<40>=MM0:[1,2]FIT   .HLP/AS/RW:NO
*SY:[1,2]RUNOFF.RNO<40>=MM0:[1,2]RUNOFF.RNO/AS/RW:NO
*^Z
>!********** DCLBLD.CTL - DCL BUILD
! Copyright (C) 1981, 1983
! by Digital Equipment Corporation, Maynard, Mass.

>
>
>
>
>
>!
!       Copy DCL files from distribution kit
!
!
RUN SY:[1,2]PIP.SAV
*SY0:[0,1]DCL.RTS/DE:NOWARN
*SY0:[0,1]DCL.RTS=MM0:[1,2]DCL.RTS/RW:NO
*SY0:[0,1]/CL:16/MODE:16=SY0:[0,1]DCL.RTS
*SY0:[0,1]DCL.DCL/PR:232/RTS:DCL/MODE:1536=MM0:[1,2]DCL.DCL/RW:NO
*LB:/PR:40=MM0:[1,2]BP2.LNK
*LB:/PR:40=MM0:[1,2]C81.LNK
*LB:/PR:40=MM0:[1,2]DIBOL.LNK
*LB:/PR:40=MM0:[1,2]DMS.LNK
*LB:/PR:40=MM0:[1,2]F77.LNK
*LB:/PR:40=MM0:[1,2]RSX11.LNK
*LB:DIB.LNK/DE:NOWARN
*^Z
>
>
>!      Install (and patch)
!       PRELIN AND SHOTER

>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]PRELIN.TSK<232>/RTS:RSX=MM0:[1,2]PRELIN.TSK/RW:NO
*^Z
>
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]SHOTER.TSK<104>/RTS:RSX=MM0:[1,2]SHOTER.TSK/RW:NO
*^Z
>
```

BUILD output (continued).

```
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]DCLUTL.TSK<232>/RTS:RSX=MM0:[1,2]DCLUTL.TSK/RW:NO
*^Z
>
>
>
>
>!      Add the DCL run-time system and related CCL commands.
!       The appropriate commands should also be added to your
!       system start up files.

>RUN SY:[1,2]UTILTY
UTILTY  V8.0-04 RSTS T8.0-04 MY SYSTEM
#REMOVE DCL
?Can't find file or account - in REMOVE
#ADD SY0:DCL
#CCL DCL=
?Can't find file or account - in CCL
#CCL CCL=
?Can't find file or account - in CCL
#CCL DCL=SY0:[0,1]DCL.DCL;PRIV 0
#CCL CCL=SY0:[0,1]DCL.DCL;PRIV 0
#EXIT
>
>



>
>
>!      Auto-patch procedure for DCL

>!
!       No patches found or patching not selected
!

>
>
>
>!      End of Build procedure for DCL

>!********** HELP.CTL - SYSTEM HELP FACILITY
! Copyright (C) 1979, 1981, 1982, 1983
! by Digital Equipment Corporation, Maynard, Mass.

>
>
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]HELP.TSK<232>/RTS:RSX=MM0:[1,2]HELP.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]HELP.TMP=KB:
! HELP.HLP - Master text file for HELP Utility
^Z
```

BUILD output (continued).

```
*SY:[1,2]HELP.HLP<40>=SY:[1,2]HELP.TMP
*SY:[1,2]HELP.TMP/DE:NOWARN
*DM1:[2,4]*.HLP<40>=MM0:[1,2]BPHELP.HLP/RW:NO
*DM1:[2,4]*.HLP<40>=MM0:[1,2]BPCOMM.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]BPSTAT.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]BPFUNC.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]BPCHLP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]DIRHLP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]FILNAM.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]FITHLP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]KEYBRD.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]CTRLT .HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]PIPHLP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]PIPDIR.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]PLEASE.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]PLEBAC.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]PLEBAT.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]PLEQUE.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]PLESPL.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]QUEHLP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]RSTS  .HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]DISK  .HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]MAGTAP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]TERMNL.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]RSX   .HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]RT11  .HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]SETHLP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]SYSHLP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]TECO  .HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]TECOFL.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]TECOMD.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]TYPE  .HLP
*DM1:[2,4]*.HLP<60>=MM0:[1,2]UTHELP.HLP
*DM1:[2,4]*.HLP<40>=MM0:[1,2]VTEDIT.HLP
*SY:[1,2]*.HLP<40>=MM0:[1,2]DCL.HLP
*^Z
>!
!       EDT.CTL
!
!       Copyright (C) 1981, 1982
!       By Digital Equipment Corporation, Maynard, Mass.
!
!       Control file to install EDT V2 on RSTS/E V7.1 System.
!
!       Requirements:
!         You must be privileged to perform the installation
!         MAKSIL must be in the system library
!         RSX Run-Time System
!           - Task builder must be in the system library
!         RT-11 Run-Time System
!           - PIP must be in the system library
```

BUILD output (continued).

```
!
!       EDT V2 is available in three configurations:
!         BLD - The normal configuration contains no overlays
!          and requires 27K words.
!         OVB - The overlaid configuration fits in about 19K words.
!         SHR - The multi-user (sharable) configuration requires a
!          resident library (21K words) and a task image (7K words).
!          The resident library requires 93 blocks of contiguous
!          disk space.
!
!       Your Swap Max must be large enough to handle the selected
!       configuration.

>
>!
!       Make sure the RSX and RT11 Run-Time Systems are ADDed
!
!
RUN SY:[1,2]UTILTY
UTILTY  V8.0-04 RSTS T8.0-04 MY SYSTEM
#ADD RSX
?Name or account now exists - in ADD
#ADD RT11
?Name or account now exists - in ADD
#EXIT
>
>
>
>
>
>!
!
!       Copy EDT V2 components onto the system.
!

>RUN SY:[1,2]PIP.SAV
*SY:=MM0:[1,2]EDTBLD.CMD/RW:NO
*SY:=MM0:[1,2]EDTOVB.ODL/RW:NO
*SY:=MM0:[1,2]EDTLIB.OLB/RW:NO
*SY:=MM0:[1,2]BLDPAT.CMD/RW:NO
*SY:=MM0:[1,2]EDTPAT.CMD/RW:NO
*LB:<40>/RMS=MM0:[1,2]EDTHEL.HLP/RW:NO
*LB:<40>=MM0:[1,2]EDT100.DOC/RW:NO
*LB:<40>=MM0:[1,2]EDT52.DOC/RW:NO
*^Z
>!
!
!       Build the requested configuration of EDT V2
!
RUN SY:[1,2]TKB.TSK
TKB>@EDTBLD.CMD
>
>!
```

BUILD output (continued).

```
!
!       Run MAKSIL to make EDT into a SIL for ONLPAT patching.
!
RUN SY:[1,2]MAKSIL
MAKSIL  V8.0-04 RSTS T8.0-04 MY SYSTEM
Resident Library name? EDT
Task-built Resident Library input file <EDT.TSK>? EDT.TSK
Include symbol table (Yes/No) <Yes>? YES
Symbol table input file <EDT.STB>? EDT.STB
Task Image SIL output file <EDT.SIL>? EDT.SIL
EDT built in 27 K-words, 465 symbols in the directory
EDT.SIL renamed to EDT.SIL<104>
>
>
>
>
>!
!       Delete extraneous or old versions of files and
!       Copy built components to the appropriate places.
!
RUN SY:[1,2]PIP.SAV
*EDTBLD.CMD,EDTOVB.ODL/DE
*EDTLIB.OLB/DE
*SY:[1,2]EDT.TMP=EDT.SIL
*EDT.TSK,EDT.SIL/DE
*EDT.CRF,EDT.MAP,EDT.STB/DE:NOWARN
*SY:[1,2]EDT.TSK,SY:[1,2]EDT.SIL/DE:NOWARN
*SY:[1,2]EDT.TSK<104>=SY:[1,2]EDT.TMP/RE
*^Z
>
>!
!       Auto-patch/installation procedure for EDT V2
!

>
>!
!       EDT V2 ("BLD" Version) has been installed
!       with protection code <104>
!
!       If you wish, add EDT as a CCL, e.g.,
!       UT CCL EDT-=SY:[1,2]EDT.TSK
!
!       End of build procedure for EDT V2
!
!       If you have a previous version of EDT installed as
!       ED2, it may be removed from your system. Be sure
!       to update your system start up control files.
!

>
>!********** SPLER.CTL - SPOOLING PACKAGE BUILD
! Copyright (C) 1979, 1981, 1982, 1983
! by Digital Equipment Corporation, Maynard, Mass.
```

```
>
>
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]QUE.TSK<232>/RTS:RSX=MM0:[1,2]QUE.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]QUEMAN.TSK/RTS:RSX=MM0:[1,2]QUEMAN.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]QUMRUN.TSK/RTS:RSX=MM0:[1,2]QUMRUN.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]OPSER.TSK/RTS:RSX=MM0:[1,2]OPSER.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]OPSRUN.TSK/RTS:RSX=MM0:[1,2]OPSRUN.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]CHARS.TSK/RTS:RSX=MM0:[1,2]CHARS.TSK/RW:NO
*^Z
>RUN DM1:[2,5]CHARS
CHARS   V8.0-04 RSTS T8.0-04 MY SYSTEM
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]SPOOL.TSK/RTS:RSX=MM0:[1,2]SPOOL.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]SPLIDL.TSK/RTS:RSX=MM0:[1,2]SPLIDL.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]SPLRUN.TSK/RTS:RSX=MM0:[1,2]SPLRUN.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]BATDCD.TSK/RTS:RSX=MM0:[1,2]BATDCD.TSK/RW:NO
*^Z
>RUN DM1:[2,5]BATDCD
BATDCD  V8.0-04 RSTS T8.0-04 MY SYSTEM

>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]BATCH.TSK/RTS:RSX=MM0:[1,2]BATCH.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]BATIDL.TSK/RTS:RSX=MM0:[1,2]BATIDL.TSK/RW:NO
*^Z
```

BUILD output (continued).

BUILD output (continued).

```
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]BATDEC.TSK/RTS:RSX=MM0:[1,2]BATDEC.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,5]BATRUN.TSK/RTS:RSX=MM0:[1,2]BATRUN.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*SY:[1,2]SPOOL .TMP=KB:
DETACH
LOGIN KB: [1,2]
FORCE KB: RUN DM1:[2,5]OPSER
FORCE KB: DETACH
LOGIN KB: [1,2]
FORCE KB: RUN DM1:[2,5]QUEMAN
FORCE KB: DETACH/PRIORITY:0
LOGIN KB: [1,2]
FORCE KB: RUN DM1:[2,5]SPOOL
FORCE KB: LP0:/HEAD:2
LOGIN KB: [1,2]
FORCE KB: RUN DM1:[2,5]BATCH



FORCE KB: BA0:/ERROR:FATAL/NOQUEUE/NODELETE
ATTACH
^Z
*SY0:[1,2]SPOOL.CMD/PR:NOWARN=SY:[1,2]SPOOL.TMP/AS
*SY:[1,2]SPOOL.TMP/DE:NOWARN
*^Z
>RUN SY:[1,2]CPATCH
CPATCH  V8.0-04 RSTS T8.0-04 MY SYSTEM
File to patch - SY0:[1,2]START.CTL
#KB:
*:G/;@SPOOL.CMD/-11C/@SPOOL.CMD/EX
Patch from _KB:[1,2].CMD complete.
#^Z
File to patch - ^Z
>RUN SY:[1,2]CPATCH
CPATCH  V8.0-04 RSTS T8.0-04 MY SYSTEM
File to patch - SY0:[1,2]CRASH.CTL
#KB:
*:G/;@SPOOL.CMD/-11C/@SPOOL.CMD/EX
Patch from _KB:[1,2].CMD complete.
#^Z
File to patch - ^Z
>
>!********** BACKUP.CTL - BACKUP PROGRAM BUILD
! Copyright (C) 1979, 1981, 1982, 1983
! by Digital Equipment Corporation, Maynard, Mass.
```

```
>
>
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACKUP.TSK<232>/RTS:RSX=MM0:[1,2]BACKUP.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACLST.TSK<232>/RTS:RSX=MM0:[1,2]BACLST.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACCON.TSK<232>/RTS:RSX=MM0:[1,2]BACCON.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACDIR.TSK<232>/RTS:RSX=MM0:[1,2]BACDIR.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACMNT.TSK<232>/RTS:RSX=MM0:[1,2]BACMNT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACLAB.TSK<232>/RTS:RSX=MM0:[1,2]BACLAB.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACDSK.TSK<232>/RTS:RSX=MM0:[1,2]BACDSK.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACKTO.TSK<232>/RTS:RSX=MM0:[1,2]BACKTO.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACCOM.TSK<232>/RTS:RSX=MM0:[1,2]BACCOM.TSK/RW:NO
*^Z
>
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACENT.TSK/RTS:RSX=MM0:[1,2]BACENT.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACFRM.TSK<232>/RTS:RSX=MM0:[1,2]BACFRM.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACPRM.TSK/RTS:RSX=MM0:[1,2]BACPRM.TSK/RW:NO
*^Z
>RUN DM1:[2,6]BACPRM
BACPRM  V8.0-04 RSTS T8.0-04 MY SYSTEM
>
>
>
>
>!*** BUILD Complete ***
```

BUILD output (continued).

BUILD has now finished processing the specified control files.

```
!*** Processing ended on 21-Jan-83 at 07:45 AM ***
```

Tailor the system message files (NOTICE.TXT and HELP.TXT).

```
>RUN $PIP
*$NOTICE.TXT

Welcome to RSTS/E V8.0  Time Sharing




*SY:$NOTICE.TXT=KB:
E.T. IS YOUR NEW SYSTEM MANAGER.^Z
*$HELP.TXT

TO GET ON-LINE AND USE RSTS/E, FOLLOW
THE INSTRUCTIONS FOUND IN THE
RSTS/E SYSTEM USER'S GUIDE.


*$HELP.TXT=KB:
IF YOU HAVE ANY QUESTIONS CALL E. T. AT EXT. 2138^Z
```

Tailor the START.CTL system control file.

```
*$START.CTL
@SY0:[1,2]RTS.CMD
@SY0:[1,2]TTY.CMD
@SPOOL.CMD[1,2]
@SY0:[1,2]CCL.CMD


DETACH
LOGIN KB0: [1,2]
FORCE KB0: RUN SY:[1,2]UTILTY
FORCE KB0: REMOVE LOGICAL LB
FORCE KB0: ADD LOGICAL DM1:[1,1]LB
FORCE KB0: EXIT
FORCE KB0: BYE/F
ATTACH
FORCE KB0: RUN DM1:[2,3]ERRINT
FORCE KB0: 100
FORCE KB0: NO
LOGINS
SEND RSTS/E IS NOW ON THE AIR...
END
```

Tailor the CRASH.CTL system control file.

```
*$CRASH.CTL
@SY0:[1,2]RTS.CMD
@SY0:[1,2]ANALYS.CMD
@SY0:[1,2]CLEAN.CMD
@SY0:[1,2]TTY.CMD
@SPOOL.CMD[1,2]
@SY0:[1,2]CCL.CMD
DETACH
LOGIN KB0: [1,2]
FORCE KB0: RUN SY:[1,2]UTILTY
FORCE KB0: REMOVE LOGICAL LB
FORCE KB0: ADD LOGICAL DM1:[1,1]LB
FORCE KB0: EXIT
FORCE KB0: RUN SY:[1,2]QUE
FORCE KB0: Q DM1:[2,3]ANALYS.DMP/DE
FORCE KB0: EXIT
FORCE KB0: BYE/F
```

```
ATTACH
FORCE KB0: RUN DM1:[2,3]ERRINT
FORCE KB0: 100
FORCE KB0: YES
LOGINS
SEND RSTS/E IS NOW ON THE AIR...
END
*^Z
>RUN $REACT
REACT   V8.0-04 RSTS T8.0-04 MY SYSTEM
System Account Manager
Function? STANDARD
Account [1,1] being bypassed
Account [1,2] on System Disk being bypassed
All Accounts in Account File are now Entered
Function? ^Z
>RUN $SHUTUP
SHUTUP   V8.0-04   RSTS T8.0-04 MY SYSTEM

08:03 AM 21-Jan-83  ########  Set-up   Dialogue   Phase  ########

Type 'ESC'('ALT') to any query to backup one (1) step

'OPSER' not running

Minutes until system shutdown (0-99) <5>?  0

08:03 AM 21-Jan-83  ########  Warning   Message   Phase  ########
Further LOGINs are now disabled

08:03 AM 21-Jan-83  ########  Initial Job Killing Phase  ########

08:03 AM 21-Jan-83  ########  Remove RTS/RES LIB  Phase  ########

08:03 AM 21-Jan-83  ########  SWAP File  Removal  Phase  ########



>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACDMP.TSK<232>/RTS:RSX=MM0:[1,2]BACDMP.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACDEL.TSK<232>/RTS:RSX=MM0:[1,2]BACDEL.TSK/RW:NO
*^Z
>
>RUN SY:[1,2]PIP.SAV
*DM1:[2,6]BACLOD.TSK<232>/RTS:RSX=MM0:[1,2]BACLOD.TSK/RW:NO
*^Z


08:03 AM 21-Jan-83  ########  Disk    DISMOUNT    Phase  ########

08:03 AM 21-Jan-83  ########  Final   Shutdown    Phase  ########

Please wait for system to re-boot itself
```

Tailor the CRASH.CTL system control file (continued).

Create user accounts.

Shut down the RSTS/E monitor.

```
RSTS T8.0-04 MY SYSTEM (DM0) INIT T8.0-04

Option: DSKINT

21-Jan-83?



08:11 AM?

Disk? DM
Unit? 1

This disk pack appears to be a RSTS/E formatted
disk with the following characteristics:

Pack ID :                SYSL1G
Pack Cluster Size :      1
Pack is currently :      Private.

Pack ID? BAKUP
Pack cluster size <1>? 4
MFD cluster size <16>?
SATT.SYS base <13543>?
Pre-extend directories <NO>? YES
PUB, PRI, or SYS <PRI>? SYS
[1,1] password <*>? PORTAL
[1,1] cluster size <16>?
[1,2] password <*>? HOME
[1,2] cluster size <16>?
[1,1] and [1,2] account base <13541>?
Date last modified <YES>?
New files first <NO>?
Read-only <NO>?
Use previous bad block info <YES>?
Format <NO>? YES
Patterns <3>?
Proceed (Y or N)? Y

Disk pack serial number = 324101

Starting format pass
End format pass

Pattern 3

Pattern 2

Pattern 1


Option: SAVRES

21-Jan-83?
08:21 AM?


SAV/RES Function: IDENTIFY
```

Shut down the RSTS/E monitor (continued).

Save your system disk onto another disk or tape. In the sample installation, the nonsystem disk is removed from DM1 and replaced with a backup system disk. This backup system disk must first be initialized.

Use SAVRES to create a backup of your system disk.

SAVRES dialogue.

SAVRES dialogue (continued).

```
From Device? DM0

          Device:       DM0:
         Pack ID:       SYSDSK
Pack Clustersize:       4
   Creation date:       Friday, 21-Jan-83


SAV/RES Function: IDENTIFY

From Device? DM1

          Device:       DM1:
         Pack ID:       BAKUP
Pack Clustersize:       4
   Creation date:       Friday, 21-Jan-83


SAV/RES Function: IMAGE

From RSTS disk? DM0

*** Input Pack ID/default Output Pack ID is SYSDSK

To RSTS DM: Disk? DM1

*** The volume on DM1: is a RSTS disk
*** Pack ID is BAKUP

*** Pack will be reinitialized
Mount it anyway <NO>? YES

*** Output Pack ID is SYSDSK

Verify (Yes or No) <NO>? YES

Proceed (Yes or No)? YES

*** Begin IMAGE copy from DM0: to DM1: at 08:23 AM

*** Begin VERIFY pass from DM0: to DM1: at 08:24 AM

*** 0 differences found

 Dismount Device:       DM1:
         Pack ID:       SYSDSK
Pack Clustersize:       4
   Creation date:       Friday, 21-Jan-83

        Please label this volume!

--- IMAGE copy operation completed at 08:26 AM

                Summary Report
```

```
IMAGE copy of DM0:SYSDSK to DM1:SYSDSK

     Input Device:       DM0:
          Pack ID:       SYSDSK
Pack Clustersize:        4
   Creation date:        Friday, 21-Jan-83

    Output Device:       DM1:
          Pack ID:       SYSDSK
Pack Clustersize:        4
   Creation date:        Friday, 21-Jan-83

IMAGE copy started on Friday, 21-Jan-83, at 08:23 AM

                Run Statistics

Transfer Totals:

        Total of 15856 blocks transferred

Error Totals:

        Total of    0 bad compares.

        Total of    0 new bad blocks encountered on source.
        Total of    0 new bad blocks encountered on destination.



        0 files structurally altered.

Timing Totals:

        Total elapsed time:   0 hrs.,   2 mins.,  51 secs.
        Total wait    time:   0 hrs.,   0 mins.,   0 secs.
        Total process time:   0 hrs.,   2 mins.,  51 secs.


SAV/RES Function: ^Z


Option:

You currently have: JOB MAX = 27, SWAP MAX = 32K.

You currently have crash dump enabled.

21-Jan-83?
08:29 AM?

1 device disabled

INIT    V8.0-04 RSTS T8.0-04 MY SYSTEM

Command File Name? START.CTL
DETACHING...
```

SAVRES dialogue (continued).

The sample installation removes the backup system disk from DM1 and replaces it with the nonsystem disk. Then the sample installation presses LINE FEED to the Option: prompt to start the RSTS/E monitor.

Specify the name of your command file.

```
^C
HELLO 1/2
Password:
Job 1 is detached under this account
Job number to attach to?
1 other user is logged in under this account




>RUN $UTILTY
UTILTY  V8.0-04 RSTS T8.0-04 MY SYSTEM
#ADD RT11
#ADD RSX
?Name or account now exists - in ADD
#ADD BP2
?Can't find file or account - in ADD
#ADD BASIC
#ADD BAS4F
?Can't find file or account - in ADD
#ADD TECO
#ADD DCL
#EXIT
>BYE/F




ATTACHING TO JOB 1
DETACHING...




^C
HELLO 1/2
Password:
Job 1 is detached under this account
Job number to attach to?
1 other user is logged in under this account




>RUN $TTYSET
TTYSET  V8.0-04 RSTS T8.0-04 MY SYSTEM
Terminal characteristics program
? EXIT
>BYE/F
```

Command file output.

```
ATTACHING TO JOB 1
DETACHING...


^C
HELLO 1/2
Password:
Job 1 is detached under this account
Job number to attach to?
1 other user is logged in under this account
```

Command file output (continued).

```
>MOUNT DM1:WRKDSK
```

The primary run-time system prompt appears. Logically mount any nonsystem disks. System generation is finished.

Be sure to run UTILTY to add your system files (for example, SWAP.SYS, OVR.SYS, CRASH.SYS, and so forth. See the *RSTS/E System Manager's Guide* for instructions on how to add these files).

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