

**RSX-11M-PLUS**  
**System Generation**  
**and Installation Guide**

Order No. AA-H431D-TC

RSX-11M-PLUS Version 3.0

First Printing, October 1979  
Revised, April 1983  
Revised, July 1985

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## PREFACE

### MANUAL OBJECTIVES

The RSX-11M-PLUS System Generation and Installation Guide is intended to guide a system manager through the steps required to generate an RSX-11M-PLUS operating system. It presents the information you need to generate a system for a specific hardware configuration and a set of application requirements.

### INTENDED AUDIENCE

This manual is intended for the system manager, who is responsible for generating an RSX-11M-PLUS system.

### STRUCTURE OF THIS MANUAL

Chapter 1, Introduction to System Generation, contains an overview of the system generation process. It outlines the steps involved in producing an RSX-11M-PLUS system.

Chapter 2, Getting Started, describes the contents, copying, and use of the distribution kit, as well as instructions for applying Update.

Chapter 3, Running SYSGEN, describes the step-by-step process followed in generating a system. It provides specific information on Executive and processor features, as well as specific device information.

Chapter 4, After SYSGEN, describes how to save and back up your generated system, run the Virtual MCR (VMR) task, and recover disk space after the system generation is complete. Also discussed are DIGITAL-supplied template files that are useful in managing your new system, how to change the system without repeating SYSGEN, and how to put more than one system on the same volume. This chapter includes a list of system initialization error messages.

Chapter 5, Pregenerated RSX-11M-PLUS Kits, describes the features and use of the pregenerated systems that are supplied on RL02 disk for use with smaller PDP-11 configurations.

Appendixes A through E supply worksheets for gathering system information, list devices included under RSX-11M-PLUS, describe various RSX-11M-PLUS system features, describe PDP-11 vector address conventions, and provide examples of typical system generations.

## PREFACE

### ASSOCIATED MANUALS

You must read the RSX-11M-PLUS Release Notes before you attempt to perform a system generation. Information that was not included in this installation guide or in other RSX-11M-PLUS manuals but that is vital to the performance of a successful system generation is contained in the Release Notes, along with a complete summary of the new features and characteristics of Version 3.0 of RSX-11M-PLUS.

The RSX-11M/M-PLUS System Management Guide contains information on utility programs that are used by the system manager to assign accounts, verify proper system operation, monitor active tasks and resources, set up and run the Queue Manager and batch processor, and perform other related tasks.

The RSX-11M-PLUS Guide to Writing an I/O Driver provides information on using SYSGEN to incorporate drivers and data bases into your system.

### CONVENTIONS USED IN THIS MANUAL

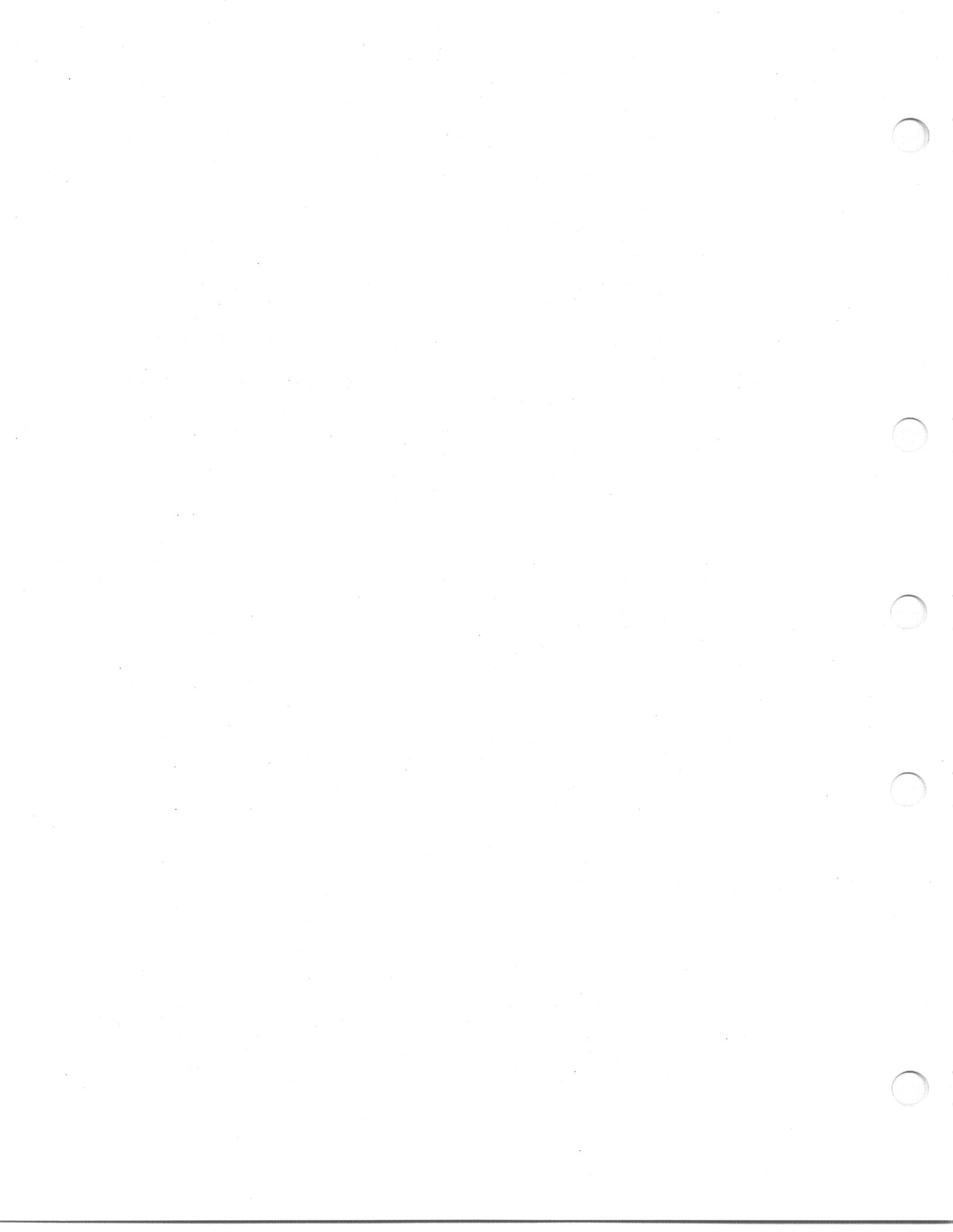
The following conventions are observed in this manual.

Convention	Meaning
<code>CTRL/a</code>	A symbol that indicates the CTRL key; it must be held down while another key is pressed. For example, <code>CTRL/Z</code> means hold down CTRL while pressing Z. In examples, this control key sequence is shown as <code>^a</code> ; for example, <code>^O</code> indicates the result of <code>CTRL/O</code> because that is how the system echoes most control key combinations.
<code>xxx</code>	A 1- to 3-character key symbol. For example, <code>RET</code> indicates the RETURN key, <code>LF</code> indicates the LINE FEED key, and <code>ESC</code> indicates the ESC key.
<code>^</code>	The circumflex character; when appearing with another character, it represents the system response to receiving a control character. For example, when you type <code>CTRL/Z</code> while running some system tasks, the system echoes <code>^Z</code> . (On some terminals, the up-arrow ( <code>^</code> ) character is used in place of the circumflex.)
UPPERCASE and lowercase	In command format descriptions, used to indicate portions of command strings that you should enter exactly as they appear. Lowercase characters are used as placeholders and descriptors, and indicate the general type of information you are to supply. An example is the following command format description:

/CSR=csr address

## PREFACE

Convention	Meaning
	<p>The portion in uppercase indicates the characters you type exactly as they appear. The portion in lowercase indicates that you should enter the CSR address at that point in the command line. If the CSR address was 176300, you would type the following command line:</p>
	<pre>/CSR=176300</pre>
"print" and "type"	<p>As these words are used in the text, the system prints and the user types.</p>
red ink	<p>Color of ink used to show all user-entered commands in examples.</p>
MCR>	<p>The explicit prompt of the Monitor Console Routine (MCR), one of the command interfaces used on RSX-11M-PLUS systems. This manual describes only MCR commands, although many of the procedures also can be accomplished using DCL commands.</p>
	<p>The MCR prompting character that appears whenever control is returned to the user task terminal and the system is ready to accept input.</p>
{ }	<p>Braces; used to enclose lists of command or message elements from which one item is selected or displayed.</p>
boldface	<p>Type used to indicate that these words have corresponding definitions in the Glossary at the end of Chapter 1.</p>



## SUMMARY OF TECHNICAL CHANGES

The RSX-11M-PLUS System Generation and Installation Guide has been revised to reflect changes made to the software for Version 3.0. Not all the alterations made to the software for this version of RSX-11M-PLUS resulted in changes to this manual; see the RSX-11M-PLUS Release Notes for a comprehensive list of all software changes.

Following is a list of the software changes, additions, and deletions that are reflected in this manual:

- You can generate an RSX-11M-PLUS system on a VAX host computer running VAX-11 RSX (Chapter 2).
- The following devices are now supported as target system disks (Chapter 2):
  - RD52
  - RD53
- The following processors are now supported (Chapter 3):
  - LSI-11/73
  - MicroPDP-11/73
  - MicroPDP-11/83
  - PDP-11/84
- The processor formerly named the MICRO/PDP-11 is now referred to as the MicroPDP-11/23.
- The following optional features have been added to SYSGEN (Chapter 3):
  - Disk data caching support
  - Extended logical name support
  - Fast map facility support
  - LAT terminal server support
  - CTRL/C abort support
  - Character translation support
  - Terminal driver extended I/O support
  - Decimal version number support for file specifications
- The SYSGEN question regarding Software Performance Monitor (SPM-11) support has been removed. SPM-11 support is always included in RSX-11M-PLUS. However, you must purchase the SPM-11 product from DIGITAL, separately from RSX-11M-PLUS.

## SUMMARY OF TECHNICAL CHANGES

- The two questions about the crash device and the crash device unit have been combined into one question.
- The following devices are now supported (Chapter 3):

DHU11  
DEUNA  
DZQ11  
KDA50  
RD52  
RD53  
RQDX2  
RQDX3  
RUX50  
TK25  
TK50

- The following terminal types are now supported (Chapter 3):

DTC01  
LA210  
LN03  
LQP02  
LQP03  
PC3xx  
VT2xx

- The SYSGEN questions about MSCP command and response rings have been deleted. The number of command and response rings is always 4.
- Most of the questions regarding support for the IP11 industrial I/O subsystem are no longer in SYSGEN. The IP11 subsystem has its own installation procedure. There are two new questions in SYSGEN about Executive support for the IP11 subsystem (Chapter 3).
- SYSGEN now creates the directories for the listing and map files if the directories do not already exist on the output disk (Chapter 3).
- SYSGEN now asks for the library directory of the target system and builds the nonprivileged tasks into that directory instead of [1,54] (Chapter 3).

## CHAPTER 1

### INTRODUCTION TO SYSTEM GENERATION

The objective of the system generation procedure is to create an RSX-11M-PLUS system tailored to your hardware configuration (consisting of a PDP-11 processor and an assortment of peripherals) and performance requirements. This chapter provides an outline of the stages involved in performing a system generation, which is controlled and performed by a program called SYSGEN.

The terms "system generation" and "SYSGEN" are used extensively throughout this manual, but not interchangeably.

System generation is used to refer to the entire process of obtaining a running RSX-11M-PLUS operating system, beginning with use of the software components supplied to you by DIGITAL and ending with a ready-to-use system.

SYSGEN is a procedure that uses the Indirect Command Processor to arrange and modify various software components and to assemble them into an RSX-11M-PLUS operating system that is tailored to a particular hardware configuration. The SYSGEN procedure is, therefore, a part of the system generation process.

Whenever this manual uses the term "system generation," the entire process of producing an RSX-11M-PLUS system is meant. "SYSGEN" is used to refer to the specific Indirect procedure used during system generation.

#### 1.1 WHICH CHAPTERS OF THIS MANUAL SHOULD YOU READ?

The RSX-11M-PLUS software you have received is supplied in one of following two forms:

- **A Distribution Kit** - A software kit that contains all the software components needed to perform a system generation using the SYSGEN procedure. This distribution kit is supplied on magnetic tape or on disk packs.
- **A Pregenerated System Kit** - A disk that contains a ready-to-run RSX-11M-PLUS operating system. You do not need to perform a system generation before using this system. The SYSGEN procedure and the software components necessary to generate a new RSX-11M-PLUS system are not supplied with this kit. There are a small number of minor changes you can make to adapt the pregenerated system kit to your model of processor and number of peripherals.

## INTRODUCTION TO SYSTEM GENERATION

If you have a distribution kit, you should read this and every chapter in this manual except Chapter 5. If you have the pregenerated system kit, do not concern yourself with the material in this and subsequent chapters. Turn directly to Chapter 5, which explains how to start using your pregenerated system.

### 1.2 FLOW OF A SYSTEM GENERATION

The process of generating an RSX-11M-PLUS operating system begins when you make a copy of the software components supplied to you on magnetic media and ends when you hardware bootstrap a system disk on a specific hardware installation. A typical system generation contains the following steps:

1. Preparation
2. Copying the distribution kit
3. Applying Update
4. Invoking the SYSGEN procedure
5. Bootstrapping the generated system
6. Saving the generated system
7. Copying the generated system

After you have completed these steps, you might need to install layered software products (higher-level languages such as FORTRAN, or communications products such as DECnet-11).

#### 1.2.1 Preparation

This manual assumes that you have a tested and working hardware system on which to generate an RSX-11M-PLUS software system. This hardware system can be either of the following:

- A PDP-11 hardware configuration that includes a processor with 22-bit addressing capability and at least one of the disk drives listed in Section 2.1.1
- A VAX hardware configuration running VAX/VMS and VAX-11 RSX and a suitable disk drive

Depending on the type of distribution kit you have, your system must have certain other peripheral devices.

This manual also assumes that you know the parameters of the target system, the hardware configuration on which you intend to run the RSX-11M-PLUS software system you are generating. You do not need to have this system available before you perform a system generation, but you need to know the specifics of the hardware and the uses to which the system will be put.

For complete information on the hardware configuration required for running RSX-11M-PLUS, see the RSX-11M-PLUS Software Product Description, which is included in every RSX-11M-PLUS documentation set. This is the definitive source for information on the systems and devices supported under RSX-11M-PLUS.

## INTRODUCTION TO SYSTEM GENERATION

Before you begin generating an RSX-11M-PLUS operating system, you need to become familiar with the system generation process and with this manual. You also need various blank media and information about your hardware device configuration. Section 2.1 describes in detail what you need before you start.

### 1.2.2 Copying the Distribution Kit

Some RSX-11M-PLUS distribution kits are supplied on magnetic tape and must be transferred to disk before you can begin the SYSGEN procedure. The magnetic tapes can be used to make additional disk copies of the distribution kit when they are needed for applying the latest Update or for generating RSX-11M-PLUS systems for changed hardware configurations.

Other RSX-11M-PLUS distribution kits are supplied on disk. You should make a copy of the DIGITAL-supplied distribution kit disk and use the copy to perform a system generation. Save the DIGITAL-supplied distribution kit disk as a master from which you can make additional copies when they are needed.

Section 2.1.2 lists the types and quantities of blank media necessary for copying the various distribution kits.

### 1.2.3 Applying Update

Update is an Indirect command file you use to apply a cumulative set of corrections to RSX-11M-PLUS and layered products. Update and Update Notes are supplied with every RSX-11M-PLUS distribution kit and are issued on a periodic basis to customers who have purchased the Update service. Instructions for applying Update are discussed in Section 2.5.

### 1.2.4 Invoking the SYSGEN Procedure

Invoking the SYSGEN Indirect command file begins an interactive terminal session in which SYSGEN gathers the information necessary to assemble and build the Executive and system data base. The SYSGEN procedure prints questions on your terminal and/or reads saved answer file input. SYSGEN then uses the information obtained to assemble, build, and initialize a binary system image.

This chapter contains short descriptions of the sections of the SYSGEN procedure; Chapter 3 presents the details of each SYSGEN section.

### 1.2.5 Bootstrapping the Generated System

You need to software bootstrap your generated system to see whether it runs successfully and to prepare for saving the system and moving it back to disk in hardware-bootstrappable format. Chapter 4 contains information on what to do at this point in the system generation process.

## 1.2.6 Saving the Generated System

When you save the generated system with the SAV /WB command line, the contents of main memory are written into the system image file. After a system has been saved, a hardware or software bootstrap can be used to reload and restart it.

## 1.2.7 Copying the Generated System

To guard against accidental corruption and loss of your generated system, you should make a backup copy of the system. In some cases, it might be necessary to transfer the generated system to a different type of disk. Chapter 4 contains instructions for making copies of system images.

## 1.3 WHAT IS SYSGEN?

SYSGEN is the Indirect command procedure used to tailor and to build an RSX-11M-PLUS operating system for a particular PDP-11 hardware configuration. The SYSGEN procedure asks questions about both the software features you wish to include in your system and about your system's hardware configuration. SYSGEN uses that information to assemble and task build an RSX-11M-PLUS operating system specifically tailored to your needs.

You should read the RSX-11M-PLUS Release Notes before attempting to run the SYSGEN procedure. You should also be familiar with the material in this manual before attempting to generate your own system. This manual contains information that will help you understand the consequences of choosing or omitting the various system options. Attempts to run SYSGEN without first consulting the documentation usually yield undesired results.

## 1.4 SYSGEN EASE-OF-USE FEATURES

SYSGEN contains a number of features designed to allow you to generate a working system as easily and rapidly as possible. The Full-functionality Executive option and the Autoconfigure task free you from the necessity of deciding among many options. The saved answer file feature lets you more easily modify your system later, if you decide to change your original configuration.

### 1.4.1 Full-Functionality Executive Option

The Full-functionality Executive contains all RSX-11M-PLUS optional features. For more information on these features and how to select the Full-functionality Executive, see Chapter 3.

### 1.4.2 Autoconfigure

The Autoconfigure task automatically determines the correct hardware configuration of the host system, including the processor type, the CSR and vector addresses of the peripheral devices, and the presence

## INTRODUCTION TO SYSTEM GENERATION

of any optional hardware. This information can be directly used by SYSGEN, thereby reducing greatly the number of questions asked in the Choosing Peripheral Configuration (CP) section. For more information on using Autoconfigure, see Chapter 3.

### 1.4.3 Saved Answer Files

Your responses to questions asked by SYSGEN are saved in special files as you generate your system. You can use these saved answer files later to generate another system without having to answer all the SYSGEN questions again. For more information on using saved answer files, see Chapter 3.

## 1.5 SECTIONS OF THE SYSGEN PROCEDURE

The SYSGEN procedure is divided into functional sections, each with a name that describes the main task performed within that section. These sections are normally performed in the order listed, with the SYSGEN procedure automatically beginning the next section when it finishes the current section.

During a complete SYSGEN, you perform the following sections:

1. Choosing SYSGEN Options (SU)
2. Choosing Executive Options (CE)
3. Choosing Peripheral Configuration (CP)
4. Assembling the Executive and Drivers (AE)
5. Building the Executive and Drivers (BE)
6. Building the Privileged Tasks (BP)
7. Building the Nonprivileged Tasks (BN)
8. Creating the System Image File (CS)

An additional section, Adding a Device (AD), is not normally performed as part of the SYSGEN procedure. For more information on this section, see Chapter 4 of this manual and Chapter 5 of the RSX-11M-PLUS Guide to Writing an I/O Driver.

In certain circumstances you might need to perform only one section of the SYSGEN procedure or to enter the SYSGEN procedure at a point other than the beginning. You are given these choices in the first section of the SYSGEN procedure, Choosing SYSGEN Options. Because certain sections rely on information obtained in other sections, you might not always be able to perform a given section without having to go back and redo previous sections.

For more information on the sections of SYSGEN and on running individual sections, see the descriptions in this chapter and in Chapter 3.

## INTRODUCTION TO SYSTEM GENERATION

### 1.5.1 Choosing SYSGEN Options (SU)

In this section, you can choose SYSGEN options such as Autoconfigure and saved answer files. Also included is a "menu" that allows you to resume a partially completed SYSGEN at the appropriate section or to perform individual sections of SYSGEN.

### 1.5.2 Choosing Executive Options (CE)

In this section, you have the opportunity to select one of two Executive configurations.

Your first choice, the Full-functionality Executive, contains all the RSX-11M-PLUS service features. Selecting this Executive guarantees that there are no missing features for external tasks (for example, layered products). In addition, if you select this Executive, you are asked fewer questions, and so the SYSGEN process is faster. Unless you have reason not to want all the RSX-11M-PLUS features available to you, you should select this Executive.

Choosing the second option, the User-tailored Executive, allows you to tailor an Executive to your specific needs. The SYSGEN command files ask you a series of questions about the features that you want your Executive to contain. You would want to select this option in only a few situations. For example, if you are generating a system intended for use by a single user, you could exclude Resource Accounting from your Executive.

During the Choosing Executive Options (CE) section, SYSGEN also asks you about the processor hardware options on the system.

### 1.5.3 Choosing Peripheral Configuration (CP)

In this section, SYSGEN asks you a series of questions about your peripheral devices. These questions constitute the most complex portion of the SYSGEN. Running Autoconfigure greatly reduces the number of questions you have to answer in this section.

### 1.5.4 Assembling the Executive and Drivers (AE)

In this section, SYSGEN assembles the Executive, the drivers, and the driver data bases. SYSGEN allows you to decide whether you want assembly listings and, if so, it directs them to a file or to the line printer.

### 1.5.5 Building the Executive and Drivers (BE)

In this section, SYSGEN task builds the Executive, the drivers, and the driver data bases. SYSGEN also allows you to save the files from a previous system generation, which might be residing in directory [1,54]. If you choose to save the old system generation files, SYSGEN transfers them to a directory that you specify.

## INTRODUCTION TO SYSTEM GENERATION

### 1.5.6 Building the Privileged Tasks (BP)

In this section, SYSGEN task builds the privileged tasks, such as MCR, LOA, MOU, and UFD. Whenever you rebuild the Executive, you must rebuild the privileged tasks.

### 1.5.7 Building the Nonprivileged Tasks (BN)

In this section, SYSGEN task builds designated nonprivileged system tasks. A nonprivileged task need only be rebuilt when it has been updated, either manually or by the Update procedure. The questions in this section allow you to choose from a list of those nonprivileged tasks that need to be rebuilt.

### 1.5.8 Creating the System Image File (CS)

In this section, the system image file is created by a VMR indirect command file named SYSVMR.CMD. (VMR is a utility that turns the Executive task file into an RSX-11M-PLUS system image file.) SYSVMR automatically establishes the partition boundaries for the system image, loads all the drivers, and installs the privileged tasks built during the Building the Privileged Tasks (BP) section.

If you want to set up the partitions in your system differently from the way in which SYSVMR sets them up, or if you wish to modify SYSVMR for any other reason, SYSGEN permits you to do so during this section.

### 1.5.9 Adding a Device (AD)

In this section, SYSGEN allows you to add or change a loadable driver with a loadable data base in an already generated system. SYSGEN asks you questions about the device's hardware configuration, generates a loadable data base, and assembles and task builds the driver and its data base. You can then load the driver into your system and bring its associated devices on line.

This section is not performed as part of a complete system generation. You can use it to add a new device or change the configuration of a device type in an existing system. This section can also be used to add a user-supplied driver.

See Section 4.7.2 for more information on the Adding a Device (AD) section.

For a complete discussion of adding loadable device drivers, see Chapter 5 of the RSX-11M-PLUS Guide to Writing an I/O Driver.

## 1.6 TERMS RELATING TO SYSTEM GENERATION

This section defines some of the terms used in this manual. The purpose of defining these terms here is to familiarize you with them before you begin generating your RSX-11M-PLUS system. To find more information on a given term, look up the term in the RSX-11M-PLUS Information Directory and Master Index. If you have performed a system generation already and feel confident about the terms listed here, you can probably skip this section and go directly to Chapter 2.

## INTRODUCTION TO SYSTEM GENERATION

### NOTE

The first time a term that relates to system generation is used in this manual, it will appear in boldface type. A definition of that term can be found in this section.

#### ACP (Ancillary Control Processor)

An ACP is a privileged task that implements a particular file structure on a class of devices. It performs volume-related functions such as maintaining directories, allocating space for files, creating and deleting files, and enforcing file protection. When a volume is mounted, it is associated with the ACP that understands its file structure.

Usually, a task communicates with FCS, FCS communicates with the ACP, and the ACP communicates with the device driver.

RSX-11M-PLUS supplies two ACPs: F11ACP for the Files-11 disk structure and MTAACP for the ANSI-formatted magnetic tape structure.

#### Autoconfigure

The Autoconfigure task automatically determines the correct hardware configuration of the host system, including the processor type, the CSR and vector addresses of the host system's peripheral devices, and the presence of optional hardware. This information can be used directly by SYSGEN, thereby greatly reducing the number of questions asked during SYSGEN.

#### baseline system

The baseline system is the stand-alone RSX-11M-PLUS system included as part of the distribution kit. It contains those software components you need to generate an RSX-11M-PLUS system.

#### CSR (Control and Status Register)

Every peripheral device has a unique address on the UNIBUS. When addressing a device, you are actually addressing a set of registers that communicate with the device. The CSR address is the address of a single register within that set of device registers; it is used by drivers to access any of the other registers within that set.

#### DIGITAL-supplied driver

The RSX-11M-PLUS distribution kit contains drivers for the hardware devices supported on RSX-11M-PLUS. These drivers are referred to as DIGITAL-supplied drivers and are supported by DIGITAL.

#### driver

A driver is a set of subroutines called by the Executive I/O system in response to I/O requests from user programs. The driver translates I/O requests into instructions directed to a specific device type. Each type of peripheral device has its own driver.

## INTRODUCTION TO SYSTEM GENERATION

A driver can be either resident or loadable. A resident driver resides within the Executive's address space, and therefore reduces primary pool space. A loadable driver resides outside the Executive's address space, and is mapped when it is needed.

Because resident drivers reside within the Executive, they must be incorporated at system generation. Loadable drivers can be added to an existing RSX-11M-PLUS system at any time, without requiring you to perform a new system generation.

In RSX-11M-PLUS systems with support for Executive data space, all drivers must be loadable.

A driver has an associated data base that describes the particular device configuration.

See the RSX-11M-PLUS Guide to Writing an I/O Driver for a full discussion of drivers and data bases.

### dual-access device

A dual-access (or dual-ported) device is an I/O device that can be accessed by either of two controllers. To install a dual-access device, you must have a dual-access hardware option that is only available with certain devices. This hardware provides two ports for accessing the device, with each port connected to a different controller. Only one port is allowed access to the device at any one time.

Under RSX-11M-PLUS, each port is connected to different controllers on the same system. This setup provides high availability and allows load sharing between the two ports.

A dual-access device can also be connected to controllers on two separate systems, but RSX-11M-PLUS does not support this configuration.

### Executive

The Executive is the software core, or kernel, of the RSX-11M-PLUS operating system. It is responsible for resource allocation, multiuser protection, and intertask communications. In general, the Executive monitors, controls, and services system-level activity. It provides a relatively machine-independent multiprogramming environment in which you can develop and run user applications.

### FCS (File Control Services)

FCS is a set of routines that a task can use to access the file system. It allows both record-oriented and block-oriented I/O and provides for device-independent file operations such as creating, deleting, opening, closing, reading, and writing. To use FCS, a task invokes the FCS macros. The macros call FCS routines, which issue the actual I/O directives (QIOs).

The FCS routines are linked with a task when the task is task-built. These routines can reside in the task's image or in a separate resident library. (See the explanations of FCSFSL and FCSRES.)

Most of the RSX-11M-PLUS tasks and utilities use FCS.

## INTRODUCTION TO SYSTEM GENERATION

### FCSFSL

FCSFSL is a supervisor-mode library of commonly used FCS routines. You can build tasks to link to this single copy of the FCS routines rather than including the routines in each task image. Having only one copy of the FCS routines in memory instead of many reduces memory usage.

A task accesses a supervisor-mode library using the supervisor-mode mapping registers, a hardware feature available on the PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83 and PDP-11/84 processors. Mapping the library in supervisor mode allows the library to reside outside the task's logical address space, thereby permitting larger tasks.

If you include supervisor-mode library support during SYSGEN, many of the RSX-11M-PLUS tasks are built to use FCSFSL. SYSGEN includes the letters "FSL" in these task file names so that you can tell which tasks are built to use FCSFSL. The FCSFSL versions of the tasks have exactly the same software features as the versions that link to FCSRES or that include the FCS routines in their task images.

See the RSX-11M/M-PLUS Task Builder Manual for more information on supervisor-mode libraries.

### FCSRES

FCSRES is a resident library of commonly used FCS routines. You can build tasks to link to this single copy of the FCS routines rather than including the routines in each separate task image. Having only one copy of the FCS routines in memory instead of many reduces memory usage.

A task accesses a resident library by using the user-mode mapping registers. These registers are also used to map the task code and data, so each task that uses the FCSRES library must reserve some of its logical address space to map the library.

The FCSRES library uses no special hardware and can thus be used on any of the processors RSX-11M-PLUS supports. If you cannot use FCSFSL tasks (because your processor does not support supervisor mode), you can instruct SYSGEN to build many of the RSX-11M-PLUS tasks to use FCSRES instead. SYSGEN includes the letters "RES" in these task file names so that you can tell which tasks are built to use FCSRES. The FCSRES versions of the tasks have exactly the same software features as the versions that link to FCSFSL or that include the FCS routines in their task images.

See the RSX-11M/M-PLUS Task Builder Manual for more information on resident libraries.

### Full-functionality Executive

The Full-functionality Executive, which is one of the options you can select in the Choosing Executive Options (CE) section of SYSGEN, contains all the RSX-11M-PLUS service features. Selecting this Executive ensures that the generative Executive includes nearly all required features for external tasks (for example, layered products). In addition, if you select this Executive, the SYSGEN procedure is shorter.

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### hardware bootstrap

A hardware bootstrap is a process whereby a user initiates a software system startup. Using the console switches and/or the console terminal, you can instruct the bootstrap ROM to load the hardware bootblock record from an input device into memory. The bootblock record contains a pointer to the code you need to load the system image into memory.

### host system

The host system is that system on which you perform an RSX-11M-PLUS system generation. It can be the same hardware on which you intend to run your new target system, or it can be a separate configuration that is more convenient to use for system generation.

### interrupt

An interrupt is a mechanism whereby the various external hardware subsystems communicate a need for software servicing.

### mapped system

PDP-11 processors supporting memory management hardware are known as mapped systems. The memory management hardware converts virtual addresses to physical addresses in memory. RSX-11M-PLUS does not support unmapped systems and only runs on systems incorporating memory management hardware.

### mixed MASSBUS configuration

A mixed MASSBUS configuration is a peripheral configuration in which devices of different types are connected to the same MASSBUS controller (RH controller).

Normally, a controller has only one type of device connected to it. For example, the first MASSBUS controller (RHA) might have all RP04s, RP05s, and RP06s (device type DB) connected to it, the second controller (RHB) might have all RM03s and RM05s (device type DR) connected to it, and so on.

In a mixed MASSBUS configuration, a controller has different types of devices connected to it. For example, the first MASSBUS controller (RHA) might have both an RP06 (device type DB) and an RM03 (device type DR) connected to it.

### on-line system

An on-line system is an operating environment that shares resources with other processing or development work in progress. In the context of SYSGEN, generating an RSX-11M-PLUS system on line means that you are using host system software and not the baseline system provided on the distribution kit.

## INTRODUCTION TO SYSTEM GENERATION

### pool

Pool (sometimes called the dynamic storage region, or DSR) is an area in memory that is used as a workspace for storing system data structures such as system lists, control blocks, and I/O packets.

There are two kinds of pool in RSX-11M-PLUS: primary pool and secondary pool. They differ in their uses and in their location.

Primary pool is an area of memory within the Executive's address space. It is used for short-lived or frequently accessed data structures. Because it is used for many Executive and I/O operations, primary pool is a critical resource, and the amount of space available is limited. The size of primary pool is fixed when the system is generated. SYSGEN always makes primary pool as large as possible.

Secondary pool is a partition in memory outside the Executive's address space. It is used for more permanent or less frequently accessed data structures. Secondary pool can be as large as you want; it is limited only by the amount of available memory. The size of secondary pool is set when the system image file is created by VMR. SYSGEN makes secondary pool a reasonable size for your hardware and software configuration.

### PREPGEN

A PREPGEN is the SYSGEN procedure performed without executing the MCR command lines that assemble, task build, and manipulate certain files. You have the opportunity to answer all SYSGEN questions and to create saved answer files, but a new system is not assembled or built, and no files are deleted.

You are given the choice of performing a PREPGEN shortly after you invoke the SYSGEN procedure.

Performing a PREPGEN saves time and prevents mistakes. PREPGEN lets you run through the SYSGEN questions and become familiar with them before you use your answers actually to generate a new system. The saved answer files generated can then be used to perform an unattended SYSGEN.

### saved answer file

Saved answer files contain the text of each question asked in the various sections of SYSGEN, along with your answers to those questions. These files are created by SYSGEN as you generate your system.

You can use previously generated saved answer files to generate a system without having to answer all the SYSGEN questions again.

### saved system

A saved system is a system image that has been bootstrapped and then written back to the system image file on disk using the MCR command SAV.

## INTRODUCTION TO SYSTEM GENERATION

### software bootstrap

A software bootstrap is a process whereby a privileged user initiates a new software system startup from an already running system. Software bootstrapping requires the use of the MCR command BOO. (See the RSX-11M/M-PLUS MCR Operations Manual, particularly the SAV and BOO commands, for details on software bootstrapping.) Any valid RSX-11M-PLUS system image can be software bootstrapped.

### stand-alone system

A stand-alone system is an operating environment that is dedicated to a single activity. In the context of SYSGEN, generating a stand-alone RSX-11M-PLUS system means that you are using the baseline system provided on the distribution kit.

### target system

The target system is the operating system produced by the system generation procedure, as well as the hardware configuration on which it is intended to run. System generation can take place on the target system computer or on a different computer. (See "host system.")

### unsaved system

An unsaved system is a system image after SYSGEN has executed the SYSVMR.COMD indirect command file and before the system has been bootstrapped and saved.

### Update

Update is an interactive procedure for applying a cumulative set of corrections to your RSX-11M-PLUS distribution kit. Update kits are issued periodically by DIGITAL. Update is supplied with every RSX-11M-PLUS distribution kit and is issued on a periodic basis to customers who have purchased Update service. After you apply Update to your distribution kit, you must perform SYSGEN to incorporate the patches into your system.

### user-supplied driver

Many users have applications that require customized or special-purpose drivers. Any device driver that is not included on the distribution kit is considered a user-supplied driver.

### User-tailored Executive

The User-tailored Executive, which is one of the options you can select from the Choosing Executive Options (CE) section of SYSGEN, allows you to tailor an RSX-11M-PLUS Executive to your specific needs. The SYSGEN command files ask you a series of questions about the features that you want your Executive to contain. You would select this option only if the Full-functionality Executive contained features that were not compatible with your application or if a special application required a smaller Executive.

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### vector

Associated with every device is a unique two-word location in the low end of memory called a vector. (The memory locations from 0 through 776(octal) are the vector areas.) Each vector stores the processor status word (PS) and the program counter (PC) of the interrupt service routine for a specific device. When a device interrupts the processor, the processor saves the current PS and PC on the stack and loads the PS and PC from the device's vector. The address in the new PC points to the interrupt service routine.

Not all vectors are assigned to peripheral devices. Some are reserved for software interrupts. For instance, execution of the TRAP instruction causes an interrupt. A new PS and PC are then loaded from the vector reserved for use only by the TRAP instruction.

In addition, there are what are known as "floating vectors." Floating vectors are those addresses from location 300(octal) through location 776(octal). The assignment of devices to those vectors is left to the discretion of the system manager and the field service representative. Generally, floating vectors are used for assigning multiple devices of a given type that require more than one controller. See Appendix E for a description of the algorithm used to assign floating vectors.

## CHAPTER 2

### GETTING STARTED

This chapter describes the steps you must take before you invoke the SYSGEN procedure.

#### 2.1 WHAT YOU NEED BEFORE YOU BEGIN

Before you follow the system generation procedure described in this manual, you should gather the necessary media, software, and hardware information you will need during the system generation. The following is a list of the items essential to a successful system generation:

- **Distribution Kit** - DIGITAL supplies on magnetic tapes or disks the RSX-11M-PLUS system software components that are used to generate a working system. Section 2.2 describes the contents of specific distribution kits.
- **Blank Media** - During system generation, you need a number of blank disks to back up the distribution kits and to contain the generated system. The type and quantity of media required depends on the type of distribution kit you have. See Section 2.1.2 for a discussion of blank media requirements.
- **Device, CSR, and Vector Data for the Target Hardware** - You need a list of the hardware devices to be supported on the generated system, their respective controllers, and the respective CSR and vector address data. You need this data even if you use Autoconfigure to aid in configuring your peripheral devices, because some of your devices may have nonstandard CSR and vector addresses and therefore will not be detected by Autoconfigure.

If you are generating an RSX-11M-PLUS system for the first time, you should obtain CSR and vector information from the DIGITAL Field Service personnel who installed your hardware system. If you are already running an RSX-11M-PLUS system on the hardware configuration for which you are generating a new RSX-11M-PLUS system, you can obtain this information using the following CON command line:

```
CON DISPLAY ATTRIBUTES FULL
```

The resulting display lists the CSR and vector information contained in the system data base, which generally, although not necessarily, reflects the actual hardware configuration. More information on the format of the display and on the CON command can be found in the RSX-11M/M-PLUS System Management Guide.

## GETTING STARTED

- **Completed Worksheets** - Appendix A contains a number of worksheets that you can use to collect and to organize the information you need to generate a system. There are worksheets for the CSR and vector address information you must gather, as well as an Executive options worksheet that you can use to record the choices you make as you read through the Choosing Executive Options section in Chapter 3.

You should make copies of these worksheets, fill them out, and keep them with you when you invoke SYSGEN.

- **RSX-11M-PLUS Release Notes** - You must read the Release Notes before you attempt to perform a system generation. The Release Notes contain information and warnings that were not incorporated into this and other manuals.
- **RSX-11M-PLUS System Generation and Installation Guide** - This manual provides step-by-step instructions for each of the operations you must perform and should be on hand as you proceed through the system generation procedure.
- **RSX-11M-PLUS Update Notes** - The latest revision of this manual is provided with your RSX-11M-PLUS distribution kit, and also is included with Update kits shipped to customers who have purchased the Update service. This manual supplements the Update information in Section 2.5. You should carefully read both to fully understand the update process before you proceed with the copying instructions in this chapter. You will have to repeat many of the copying steps if you proceed without reading this manual.

### 2.1.1 Supported Target System Disks

Before you can invoke SYSGEN, you must copy the distribution kit software to the disk on which you will generate the new system. Throughout this manual, this disk is called the target system disk.

For an RSX-11M-PLUS system generation, your target system disk may be one of the following:

RC25	RM03	RA81
RD52	RM05	RP04
RD53	RM80	RP05
RK07	RA60	RP06
RM02	RA80	

### 2.1.2 Blank Media Requirements

Use the following guidelines in determining the quantity of blank media to have on hand as you generate your system:

- **Target System Disk** - If you have the magnetic tape kit, you need at least one disk to make a copy of the distribution kit. If you intend to use an RC25, RD52, or RK07 as the target system disk, you need two blank disks, because the entire magnetic tape distribution kit does not fit on one disk. If you have the RK07 disk kit, you need two blank RK07 disks to copy both of the distribution kit disks.

## GETTING STARTED

- **Backup Copy of Generated System** - You should keep a backup copy of the finished RSX-11M-PLUS system you generate, in case the system disk becomes accidentally corrupted. You can back up the target system disk to magnetic tape or to another disk, depending on your needs and on your hardware configuration. You need one 2400-ft magnetic tape (or two 2400-ft tapes if you save the system on tape at a density of 800 bpi instead of at a density of 1600 bpi) or one TK50 magnetic tape cartridge for backing up the system to tape. If you back up the system to disk, you need a blank disk of sufficient size to hold the files on the target system disk.

If you have an RL02 pregenerated system kit, see Chapter 5 for blank media requirements.

### 2.1.3 Device Mnemonic Information

In RSX-11M-PLUS commands and in SYSGEN, peripheral devices are referred to both by their hardware names (for example, RM05 disk drive, TU77 tape drive) and by their software device mnemonics (for example, DR1: and MM0:). Appendix B contains a list of hardware names and their respective software device mnemonics for all RSX-11M-PLUS devices.

## 2.2 THE DISTRIBUTION KIT

A distribution kit is a collection of magnetic media containing the software components you need to generate an RSX-11M-PLUS system. The types of distribution kits available for RSX-11M-PLUS are as follows:

- Magnetic tape - 800 bpi
- Magnetic tape - 1600 bpi
- TK50 magnetic tape cartridge
- RK07 disk
- RL02 disk

The RL02 disk kit is unlike the other kits. It contains a pregenerated, ready-to-use RSX-11M-PLUS system, and a system generation is not needed. You must follow different procedures for setting up and using this kit. See Chapter 5 for a complete description of the contents and use of the RL02 pregenerated system kit.

Procedures for handling the magnetic tape (including the TK50 magnetic tape cartridge), and RK07 disk kits are described in this and subsequent chapters.

Each kit contains the following software items:

- Update, a procedure used to apply corrections to the RSX-11M-PLUS and layered product files
- The distribution kit proper, containing the RSX-11M-PLUS Executive and driver source files, privileged and nonprivileged tasks, object libraries, SYSGEN command files, and other files needed to generate an RSX-11M-PLUS system

## GETTING STARTED

- The baseline system, a pregenerated, bootstrappable, RSX-11M-PLUS system supplied as an operating environment for performing a stand-alone system generation
- A stand-alone RSX-11S system (BRUSYS), used to copy the distribution kit tape to disk (or, in the case of the RK07 disk kit, to copy the kit disk to another RK07 disk)

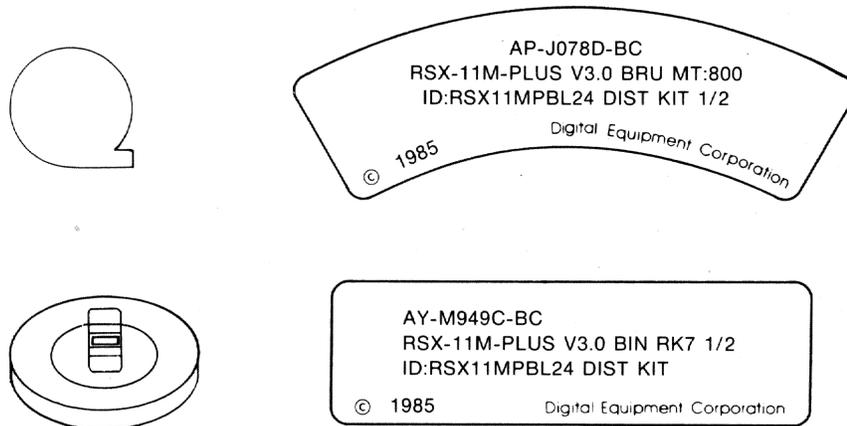
Update is used to apply the latest corrections to the RSX-11M-PLUS distribution kit and/or layered products you might install on your system. The distribution kit proper, the baseline system, and the BRUSYS system are used together to perform a system generation. The Update procedure is explained in Section 2.5 and Update Notes accompany each Update.

The distribution kit proper consists of two parts. The first part contains all the source, command, and object files needed to perform a system generation, while the second part contains source and other miscellaneous files.

In magnetic tape kits and in the TK50 magnetic tape cartridge kits, both parts exist on the tape as backup sets created by the Backup and Restore Utility (BRU), one backup set for each part. You must copy these backup sets to disk before you can perform a system generation.

In RK07 disk kits, each part is supplied on a separate disk. You should make a copy of the distribution kit disks and use those copies to perform a system generation. Save the DIGITAL-supplied disks as masters from which you can make fresh copies of the unaltered distribution kit, should the need arise.

Figure 2-1 is an example of the paper labels that are attached to the magnetic tapes or disks in the RSX-11M-PLUS distribution kits.



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Figure 2-1 Examples of Paper Labels  
for Magnetic Tapes and for Disks

Each paper label contains the following items of information:

- DIGITAL product order number
- Operating system name and version number
- Tape format (for example, BRU) or disk format (for example, BIN, meaning "binary")

## GETTING STARTED

- Density (for magnetic tapes only)
- Type of distribution kit (such as RK7 for the RK07 disk kit)
- Software volume label prefixed "ID:" (such as ID:MPLUSBL24SRC)
- Descriptive text (such as DIST KIT or BRUSYS STANDALONE COPY SYSTEM)
- Tape reel or disk number (such as 1/5, which means "reel one of five reels")

Check the tapes or disks you receive against the lists in the following sections to identify the various elements of the kit and ensure that you have received a complete kit.

### 2.2.1 Magnetic Tape - 1600 bpi

This kit consists of three magnetic tapes:

- Distribution kit (ID:RSX11MPBL24 DIST KIT)
- Update kit
- BRUSYS stand-alone system

### 2.2.2 Magnetic Tape - 800 bpi

This kit consists of four magnetic tapes:

- Distribution kit tape 1 (ID:RSX11MPBL24 DIST KIT 1/2)
- Distribution kit tape 2 (ID:RSX11MPBL24 DIST KIT 2/2)
- Update kit
- BRUSYS stand-alone system

The first distribution kit tape contains all the first BRU backup set and part of the second. The second distribution kit tape contains the remainder of the second BRU backup set.

### 2.2.3 TK50 Magnetic Tape Cartridge

This kit consists of three magnetic tape cartridges:

- Distribution kit (ID:RSX11MPBL24 DIST KIT)
- Update kit
- BRUSYS stand-alone system

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### 2.2.4 RK07 Disk

This kit consists of two RK07 disks:

- Distribution kit disk 1 (ID:RSX11MPBL24 DIST KIT)
- Distribution kit disk 2 (ID:MPLUSBL24SRC DIST KIT)

The first distribution kit disk contains all the software components needed to perform a complete system generation. The second distribution kit disk contains miscellaneous source files and update files.

### 2.3 HOST SYSTEMS FOR GENERATING RSX-11M-PLUS

To generate an RSX-11M-PLUS system, you must have a running RSX-11M-PLUS Version 2.1 or Version 3.0 system or a VAX computer running VAX-11 RSX Version 1.0 to manage the host computer's resources. The host computer is the computer on which you are generating your new RSX-11M-PLUS system. It may or may not be the computer for which you are generating the new RSX-11M-PLUS system; that computer is referred to as the target computer.

#### 2.3.1 Generating a New RSX-11M-PLUS System Stand Alone

If your hardware installation is new, or if you do not have access either to a computer running RSX-11M-PLUS Version 2.1 or Version 3.0 or a VAX computer running VAX-11 RSX Version 1.0, you must use the baseline system supplied with the distribution kit to manage the host computer's resources and run the SYSGEN procedure. This is known as a stand-alone system generation.

#### 2.3.2 Generating a New RSX-11M-PLUS System On Line

If a host computer is already running an RSX-11M-PLUS system (either Version 2.1 or Version 3.0), or if you have access to a VAX computer running VAX-11 RSX, you can use that running system to copy the distribution kit and to run the SYSGEN procedure and related tasks. This is known as an on-line system generation.

### 2.4 COPYING THE DISTRIBUTION KIT

Before you can invoke SYSGEN, you must copy the distribution kit software to the target system disk. Even if you have an RK07 disk distribution kit, you should make a copy of the DIGITAL-supplied distribution kit disk and use that copy as the target system disk. If you work on a copy of the distribution kit, you will always have an unaltered copy of the distribution kit to use should the target system disk accidentally become corrupted during the system generation procedure. In addition, if you intend to apply the latest corrections to your RSX-11M-PLUS system using Update, you must have an unaltered copy of the original distribution kit.

## GETTING STARTED

Because you must copy the magnetic tape distribution kit to a disk before invoking SYSGEN, the original kit tapes can be used at any time to make fresh disk copies. The procedure for copying your distribution kit depends on the type of kit you have and whether you are performing a stand-alone or an on-line system generation.

### NOTE

You must read Section 2.5 and the RSX-11M-PLUS Update Notes before you proceed with the copying instructions in this chapter. The copying procedure changes in some respects with each revision of Update; if you proceed without reading the Update Notes, you may have to repeat many of the steps in this chapter.

If you have an RL02 pregenerated system kit, turn directly to the special instructions in Section 2.5.6 (if you need to apply Update) and in Chapter 5 of this manual. If you are generating your new system stand alone, read Section 2.4.1 next. If you are generating your new system on line, read Section 2.4.2 next. If you are generating your new system on a VAX host computer running VAX-11 RSX, read Section 2.4.3 next.

#### 2.4.1 Copying Kits Stand Alone

If you have a magnetic tape distribution kit, you must copy the distribution kit to the target system disk. If you have an RK07 disk kit, you must make a copy of the distribution kit disk to use as the target system disk. The following sections describe the procedures used to copy each type of distribution kit using the BRUSYS and baseline stand-alone systems.

**2.4.1.1 The BRUSYS System** - The BRUSYS system is a limited-feature, memory-resident RSX-11S system. It is meant to be used only to prepare the target system disk and to copy the magnetic tape distribution kit, or to copy RK07 disk kits. The baseline system contained on the target system disk is used as the operating environment for stand-alone system generations. Included with the BRUSYS system are copies of the following utilities:

- Backup and Restore Utility (BRU)
- Bad Block Locator Utility (BAD)
- Disk Volume Formatter (FMT)
- Disk Save and Compress Program (DSC)

Also included is a special-purpose configuration program (CNF) that allows you to change the CSR and vector addresses in the BRUSYS system. The BRUSYS system expects your devices to be at the following CSR and vector addresses:

Device	Formatter Number	CSR	Vector
DB		176700	254
DM		177440	210
DR		176300	150
DU		172150	154

## GETTING STARTED

Device	Formatter Number	CSR	Vector
MM	0	172440	330
MS		172522	224
MT		160000	320
MU		174500	260

If your devices are at different CSR and vector addresses, if your MM-type magnetic tape drive is on a different formatter number, or if CNF returns an "Invalid device" message, you must change the values in BRUSYS. You can do this by using the following CNF switches when you enter the device name:

```
/CSR=csr address  
/VEC=vector address  
/FOR=formatter number
```

The vector addresses that BRUSYS expects for DR-, MM-, and MT-type devices are nonstandard. The CSR addresses that BRUSYS expects for DR- and MT-type devices are also nonstandard. If you are using one of these devices as an input or output device, you will always have to change the values in BRUSYS to match the CSR and vector addresses of your hardware. You can enter the standard values for these devices by using the following responses to CNF:

```
DR:/CSR=176700/VEC=254  
MM:/VEC=224  
MT:/CSR=172522/VEC=224
```

To begin copying your distribution kit, you must hardware bootstrap the BRUSYS stand-alone system on your host computer. The procedure for hardware bootstrapping the BRUSYS system depends on the bootstrap hardware present on the host computer.

For information on the bootstrapping procedures for specific hardware configurations, refer to the documentation supplied with your hardware or consult DIGITAL Field Service.

If you have a magnetic tape kit, read Section 2.4.1.2 next. If you have an RK07 disk kit, read Section 2.4.1.3 next.

**2.4.1.2 Copying the Magnetic Tape Kit Stand Alone** - Use the following procedure to copy the 800-bpi magnetic tape, 1600-bpi magnetic tape, or TK50 magnetic tape cartridge kits using a host computer stand alone. The output disk referred to in this section is the blank disk you intend to use as the target system disk. All commands shown in this section are issued to the MCR command line interpreter.

1. Put the BRUSYS tape and the output disk in the appropriate drives. If you are not familiar with the procedure for using the tape or disk drives, consult the hardware documentation for the drives.
2. Hardware bootstrap the BRUSYS tape. The RSX-11S stand-alone system prints an identification line on the console terminal, and then it begins to run the Stand-Alone Configuration and Disk Sizing Program (CNF).

## GETTING STARTED

3. In response to the "First device" prompt from CNF, enter the /DEV switch. CNF prints a list of the CSR and vector addresses that BRUSYS expects for each device. For example:

```
>Enter first device: /DEV (RET)
```

Device	CSR	Vector	CSR Status
-----	-----	-----	
DB	176700	254	Present
DK	177404	220	Present
DL	174400	160	Present
DM	177440	210	Present
DP	176714	300	Not Present
DR	176300	150	Present
DU	172150	154	Present
MM FOR=0	172440	330	Not Present
MS	172522	224	Present
MT	172522	320	Not Present
MU	174500	260	Not Present

In the example, CNF does not find devices at the default CSR addresses for DP-, MM-, MT-, and MU-type devices. If you want to use any of those devices in copying the distribution kit, you would enter the actual CSR and/or vector address for that device using the /CSR or /VEC switches.

If both devices you are using to copy the distribution kit are at the CSR and vector addresses that BRUSYS expects, follow the instructions in step 4.

The vector addresses that BRUSYS expects for DR-, MM-, and MT-type devices are nonstandard. The CSR addresses that BRUSYS expects for DR- and MT-type devices are also nonstandard. If you are using one of these devices to copy the distribution kit, skip to step 5 for instructions on how to change the values in BRUSYS to match the CSR and vector addresses of your hardware.

If one or both of the devices you are using to copy the distribution kit are not at the CSR and vector addresses that CNF prints on your terminal, skip to step 5.

4. Enter your device specifications in response to the prompts from CNF. The "first device" is the tape drive containing the BRUSYS tape; the "second device" is the drive containing the output disk.

If CNF returns an "Invalid device" message when you enter either of the device specifications, follow the instructions in step 5. If CNF does not print the error message, skip to step 6.

5. If your magnetic tape controller or your disk controller, or both, are not connected to CSR and vector addresses that BRUSYS expects, or if your MM-type magnetic tape drive is on a formatter number other than zero, you must modify the software to incorporate the correct addresses. You can do this by using the following CNF switches when you enter each device name:

```
/CSR=csr address  
/VEC=vector address  
/FOR=formatter number
```

## GETTING STARTED

For example, if you have a TU16 magnetic tape at nonstandard CSR and vector addresses of 176300(octal) and 150(octal), respectively, an RP04 with the default addresses, and the unit number of both units is zero, the following is the sequence of commands to CNF:

```
Enter first device: MM0:/CSR=176300/VEC=150 (RET)
```

```
Enter second device: DBO: (RET)
```

If CNF prints an "Invalid device" error message when you enter either of the device specifications, check to see that the actual CSR and vector addresses for that device are the ones you entered.

6. After you have successfully entered device specifications for the first and second devices, press the RETURN key and enter the date and time using the TIM command. Then use the TIM command again to verify that you entered the correct date and time. For example:

```
Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY' (RET)
```

```
>TIM 20:06 06/02/85 (RET)
```

```
>TIM (RET)
```

```
20:06:01 2-JUN-85
```

7. Format the output disk, if necessary. Disks purchased from DIGITAL are preformatted. You may skip this step if you are certain that your disk is properly formatted. Disks from other vendors or disks that have produced I/O errors may need to be formatted. For example, if your output disk is DBO:, use the following command sequence:

```
>RUN FMT (RET)
```

```
FMT> DBO:/VERIFY (RET)
```

```
** WARNING - Data will be lost on DBO:
```

```
Continue? [Y OR N]: Y (RET)
```

```
Start formatting
```

```
Start verification
```

```
Operation complete
```

```
FMT> (CTRL Z)
```

8. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output device is DBO:, use the following command sequence:

```
>RUN BAD (RET)
```

```
BAD>DBO:/LIST (RET)
```

```
BAD -- DBO: Total bad blocks= 0.
```

```
BAD > (CTRL Z)
```

9. Remove the BRUSYS tape from the tape drive, and replace it with the distribution kit tape. (If you have an 800-bpi tape kit, load the first of the two distribution kit tapes.)

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10. Run the Backup and Restore Utility (BRU) to copy the first backup set on the distribution kit tape to the output disk.

In the BRU command line, you must specify the maximum number of files permitted on and the number of file headers initially allocated to the disk volume to which you are copying the distribution kit tape. To set these values, you need to use the BRU /MAXIMUM and the /HEADERS qualifiers respectively. Table 2-1 gives the appropriate values needed for the arguments to the /MAXIMUM and /HEADERS qualifiers.

Table 2-1  
Disk Initialization Qualifier Values

Device	Value for /MAX Qualifier	Value for /HEADERS Qualifier
RA60	24617	12308
RA80	14591	7295
RA81	54815	51699
RC25	3308	1565
RD52	3719	1859
RD53	8529	4264
RK07	3308	1654
RM02/RM03	8099	4049
RM05	30781	25593
RM80	14923	7461
RP04/RP05	10567	5283
RP06	20956	10478

For example, if you have a 1600-bpi distribution kit tape mounted on MMO:, and an RP06 output disk mounted on a drive designated as DBO:, use the following command sequence:

```
>RUN BRU 
BRU>/DENSITY:1600/VERIFY/MAX:20956/HEADERS:10478 
From:   MMO: 
To:     DBO: 

BRU - Starting Tape 1 on MMO:

BRU - End of Tape 1 on MMO:

BRU - Starting verify pass Tape 1 on MMO:

BRU - End of Tape 1 on MMO:

BRU - Completed

BRU> 
```

If you have an 800-bpi tape kit, alter the argument of the /DENSITY switch to 800 (for example, /DENSITY:800).

If you have a TK50 magnetic tape cartridge kit, do not use the /DENSITY switch in the command line.

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If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new output disk. If the verify operation fails once again, your distribution kit tape is probably defective and should be replaced.

When BRU finishes, the output disk contains a bootstrappable baseline system and is referred to as the target system disk.

### NOTE

Do not remove the distribution kit tape from the drive at this point. The second backup set is automatically copied by the baseline startup procedure that runs after you bootstrap the baseline system in the next step.

11. Hardware bootstrap the target system disk. This brings the baseline system into memory. (Consult your hardware documentation or DIGITAL Field Service for information on bootstrapping disks on your particular hardware configuration.)

When the baseline system comes up, it prints an identification line and invokes the baseline startup command file, BASTART.CMD, which asks a number of questions pertaining to your system. Answer these inquiries appropriately. BASTART.CMD then runs on-line BRU to copy the second backup set from the distribution kit tape. When BASTART.CMD exits, you may remove the distribution kit tape from the tape drive. Proceed to Section 2.5 (if you need to apply Update) and then to Chapter 3 for the next steps in the system generation procedure.

**2.4.1.3 Copying the RK07 Disk Kit Stand Alone** - Use the following procedure to copy the RK07 disk kit using the host computer stand alone. The output disk referred to in this section is the blank disk you intend to use as the target system disk. All commands shown in this section are issued to the MCR command line interpreter.

1. Put the first distribution kit disk and a blank RK07 disk in your RK07 drives. If you are not familiar with the procedure for using RK07 disk drives, consult the hardware documentation for the drives.
2. Hardware bootstrap the distribution kit disk. This brings the baseline system into memory. The baseline system prints an identification line and invokes the baseline startup command file, BASTART.CMD, which prompts you for the date and time. Press CTRL/Z in response to the prompt to exit from BASTART.CMD. This command file will be run again after you have copied your kit.
3. Write-protect the distribution kit disk using the write-protect switch on the drive. Then software bootstrap the BRUSYS system, using the following command line:

```
>BOO [6,54]BRUSYS (RET)
```

## GETTING STARTED

This brings the BRUSYS system into memory. The RSX-11S stand-alone system prints an identification line on the console terminal, and then runs the Stand-Alone Configuration and Disk Sizing Program (CNF) .

4. In response to the "First device" prompt from CNF, enter the /DEV switch. CNF prints a list of the CSR and vector addresses that BRUSYS expects for each device. For example:

```
>Enter first device: /DEV RET
```

Device	CSR	Vector	CSR Status
DB	176700	254	Present
DK	177404	220	Present
DL	174400	160	Present
DM	177440	210	Present
DP	176714	300	Not Present
DR	176300	150	Present
DU	172150	154	Present
MM FOR=0	172440	330	Not Present
MS	172522	224	Present
MT	172522	320	Not Present
MU	174500	260	Not Present

If the RK07 disk drives you are using to copy the distribution kit are at the CSR and vector addresses that CNF prints on your terminal, follow the instructions in step 5.

If the RK07 disk drives you are using to copy the distribution kit are not at the CSR and vector addresses that CNF prints on your terminal, skip to step 6.

5. Enter your device specifications in response to the prompts from CNF. The "first device" is the drive containing the distribution kit disk; the "second device" is the drive containing the output disk.

If CNF returns an "Invalid device" message when you enter either of the device specifications, follow the instructions in step 6. If CNF does not print the error message, skip to step 7.

6. If your disk controller is not connected to CSR and vector addresses that BRUSYS expects, you must modify the software to incorporate the correct addresses. You can do this by using the following CNF switches when you enter each device name:

```
/CSR=csr address  
/VEC=vector address
```

For example, if your disk controller is at nonstandard CSR and vector addresses of 177444 (octal) and 240 (octal), respectively, and if you are using drives DMO: and DM1:, the following is the sequence of commands to CNF:

```
Enter first device: DM0:/CSR=177444/VEC=240 RET
```

```
Enter second device: DM1:/CSR=177444/VEC=240 RET
```

If CNF prints an "Invalid device" error message when you enter either of the device specifications, check to see that the actual CSR and vector addresses for that device are the ones you entered.

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7. After you have successfully entered device specifications for the first and second devices, press the RETURN key and enter the date and time using the TIM command. Then use the TIM command again to verify that you entered the correct date and time. For example:

```
Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY' (RET)
>TIM 07:47 05/20/85 (RET)
>TIM (RET)
07:47:0120-MAY-85
```

8. Format the output disk, if necessary. Disks purchased from DIGITAL are preformatted. You may skip this step if you are certain that your disk is properly formatted. Disks from other vendors or disks that have produced I/O errors may need to be formatted. For example, if your output disk is DM1:, use the following command sequence:

```
>RUN FMT (RET)
FMT>DM1:/VERIFY (RET)
** WARNING - Data will be lost on DM1:
Continue? [Y OR N]: Y (RET)
Start formatting
Start verification
Operation complete
FMT > (CTRL/Z)
```

9. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output device is DM1:, use the following command sequence:

```
>RUN BAD (RET)
BAD>DM1:/LIST (RET)
BAD --DM1: Total bad blocks= 0.
BAD > (CTRL/Z)
```

10. Run the Backup and Restore Utility (BRU) to copy the distribution kit disk to the output disk. For example, if the distribution kit disk is mounted on DMO: and the output disk is mounted on DM1:, use the following command sequence:

```
>RUN BRU (RET)
BRU>/VERIFY (RET)
From: DMO: (RET)
To: DM1: (RET)
BRU - Starting verify pass
BRU - Completed
BRU> (CTRL/Z)
```

## GETTING STARTED

If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new output disk. If the verify operation fails once again, your distribution kit disk is probably defective and should be replaced.

When BRU finishes, the output disk contains a bootstrappable baseline system and is referred to as the target system disk.

11. Remove the first distribution kit disk and the copy you just made from their drives, and replace them with the second distribution kit disk and another blank RK07 disk, respectively. Repeat steps 8, 9, and 10 to copy the second distribution kit disk.

### NOTE

If you need to apply Update before performing the system generation and have the RK07 disk Update kit, substitute disk 2 of your RSX-11M-PLUS Version 3.0 distribution kit with the Update kit disk. From this point on, use the Update kit disk as disk 2 of the RSX-11M-PLUS Version 3.0 distribution kit.

When BRU finishes, remove the second distribution kit disk and replace it with the copy of the first distribution kit disk (the target system disk). Write-enable the copy of the distribution kit disk.

At this point, you should set aside your original distribution kit disks for safekeeping. The copies of these disks that you just made should be loaded and ready in your RK07 drives and both disks should be write-enabled.

12. Hardware bootstrap the target system disk. This brings the baseline system into memory. (Consult your hardware documentation or DIGITAL Field Service for information on bootstrapping disks on your particular hardware configuration.)

When the baseline system comes up, it prints an identification line and invokes the baseline startup command file, BASTART.CMD, which asks a number of questions pertaining to your system. Answer these inquiries appropriately. When BASTART.CMD exits, proceed to Section 2.5 (if you need to apply Update) and then to Chapter 3 for the next steps in the system generation procedure.

### 2.4.2 Copying Kits On Line

The following two sections describe procedures for copying the magnetic tape (including the TK50 magnetic tape cartridge distribution kit) and RK07 distribution kits using a host computer already running an RSX-11M-PLUS system.

If you are using a VAX host computer running VAX-11 RSX, go directly to Section 2.4.3 next. If you have a magnetic tape kit, read Section 2.4.2.1 next. If you have an RK07 disk kit, read Section 2.4.2.2 next.

**2.4.2.1 Copying the Magnetic Tape Kit On Line** - Use the following procedure to copy the 800-bpi magnetic tape, 1600-bpi magnetic tape, or TK50 magnetic tape cartridge kits using a host computer running an RSX-11M-PLUS system. The output disk referred to in this section is the blank disk you intend to use as the target system disk. All commands shown in this section are issued to the MCR command line interpreter.

1. Log in to a privileged account on the host system.
2. Put the distribution kit tape and the output disk in the appropriate drives. (If you have an 800-bpi tape kit, use the first of the two distribution kit tapes.) If you are not familiar with the procedure for using the tape or disk drives, consult the hardware documentation for the drives.
3. Allocate and mount the distribution kit tape and the target system disk, using the MOU /FOR switch to mount the tape and the disk as foreign volumes. For example, if your distribution kit tape is on MS0: and your output disk is on/DR2:, use the following command sequence:

```
>ALL MS0: (RET)
>ALL DR2: (RET)
>MOU MS0:/FOR (RET)
>MOU DR2:/FOR (RET)
```

4. Format the output disk; if necessary. Disks purchased from DIGITAL are preformatted. You may skip this step if you are certain that your disk is properly formatted. Disks from other vendors or disks that have produced I/O errors may need to be formatted. For example, if your output disk is DR2:, use the following command sequence:

```
>RUN $FMT (RET)
FMT>DR2:/VERIFY (RET)

** WARNING - Data will be lost on DR2: **

Continue? [Y OR N]: Y (RET)

Start formatting

Start verification

Operation complete

FMT> (CTRL/Z)
```

5. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output disk is DR2:, use the following command sequence:

```
>RUN $BAD (RET)
BAD> DR2:/LIST (RET)
BAD -- DR2: Total bad blocks= 0.
BAD > (CTRL/Z)
```

6. Run the Backup and Restore Utility (BRU) to copy the first backup set on the distribution kit tape to the output disk.

In the BRU command line, you must specify the maximum number of files permitted on and the number of file headers initially allocated to the disk volume to which you are

## GETTING STARTED

copying the distribution kit tape. To set these values, you need to use the BRU /MAXIMUM and the /HEADERS switches respectively. Table 2-2 gives the appropriate values needed for the arguments to the /MAXIMUM and /HEADERS switches.

Table 2-2  
Disk Initialization Qualifier Values

Device	Value for /MAX Switch	Value for /HEADERS Switch
RA60	24617	12308
RA80	14591	7295
RA81	54815	51699
RC25	3308	1565
RD52	3719	1859
RD53	8529	4264
RK07	3308	1654
RM02/RM03	8099	4049
RM05	30781	25593
RM80	14923	7461
RP04/RP05	10567	5283
RP06	20956	10478

For example, if you have a 1600-bpi distribution kit tape mounted on MS0:, and an RM03 output disk mounted on DR2: use the following command sequence:

```
>RUN $BRU (RET)
BRU>/DENSITY:1600/VERIFY/INITIALIZE/MAX:8099/HEADERS:4049 (RET)
From: MS0: (RET)
To: DR 2: (RET)

BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Starting verify pass Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed

BRU> (CTRL/Z)
```

If you have an 800-bpi tape kit, alter the argument of the /DENSITY switch to 800 (for example, /DENSITY:800).

If you have a TK50 magnetic tape cartridge kit, do not use the /DENSITY switch in the command line.

If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new output disk. If the verify operation fails once again, your distribution kit tape is probably defective and should be replaced.

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When BRU finishes, the output disk contains a bootstrappable baseline system and is referred to as the target system disk.

### NOTE

Do not remove the distribution kit tape from the drive at this point. The second backup set is automatically copied by the baseline startup command file that you invoke in step 8.

7. Dismount the target system disk and mount it again, this time using the volume label (RSX11MPBL24) instead of the /FOR switch. Then set your device default to the target system disk device. For example, if your target system disk is DR2:, use the following command sequence:

```
>DMO DR2:/LOCK=NOUNLOAD (RET)
DMO -- TT55:  dismounted from DR2:  *** Final dismount initiated ***
>MOU DR2:RSX11MPBL24 (RET)
>ASN DR2: =SY (RET)
```

8. Change your default directory to [2,54]. Then invoke the baseline startup command file, BASTART.CMD. Use the following command sequence:

```
>SET /UIC=[2,54] (RET)
>@BASTART (RET)
```

BASTART.CMD asks a number of questions pertaining to your system. Answer these inquiries appropriately. BASTART.CMD then runs BRU to copy the second backup set from the distribution kit tape. When BASTART.CMD exits, you may remove the distribution kit tape from the tape drive. Proceed to Section 2.5 (if you need to apply Update) and then to Chapter 3 for the next steps in the system generation procedure.

**2.4.2.2 Copying the RK07 Disk Kit On Line** - Use the following procedure to copy the RK07 disk kit using a host computer running an RSX-11M-PLUS system. The output disk referred to in this section is the blank disk you intend to use as the target system disk. All commands shown in this section are issued to the MCR command line interpreter.

### NOTE

This procedure requires two free RK07 drives. If your system has only two RK07 drives, and one of them contains your system disk, you cannot copy your RK07 kit on line. You must use the stand-alone copying procedure described in Section 2.4.1.3.

1. Log in to a privileged account on the host system.
2. Put the first distribution kit disk and a blank RK07 disk in your RK07 drives, and then write-protect the distribution kit disk. If you are not familiar with the procedure for using RK07 disk drives, consult the hardware documentation for the drives.

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- Allocate and mount the kit disk and the output disk, using the /FOR switch with the MOU command to mount the disks as foreign volumes. For example, if your distribution kit disk is DMO: and your output disk is DM1:, use the following command sequence:

```
>ALL DMO: (RET)
>ALL DM1: (RET)
>MOU DMO:/FOR (RET)
>MOU DM1:/FOR (RET)
```

- Format the output disk, if necessary. Disks purchased from DIGITAL are preformatted. You may skip this step if you are certain that your disk is properly formatted. Disks from other vendors or disks that have produced I/O errors may need to be formatted. For example, if your output disk is DM1:, use the following command sequence:

```
>RUN $FMT (RET)
FMT>DM1:/VERIFY (RET)

** WARNING - Data will be lost on DM1: **

Continue? [Y OR N]: Y (RET)

Start formatting

Start verification

Operation complete

FMT> (CTRL/Z)
```

- Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output disk is DM1:, use the following command sequence:

```
>RUN $BAD (RET)
BAD> DM1:/LIST (RET)
BAD -- DM1:Total bad blocks= 0.
BAD> (CTRL/Z)
```

- Run the Backup and Restore Utility (BRU) to copy the distribution kit disk to the output disk. For example, if the distribution kit disk is mounted on DMO: and the output disk is mounted on DM1:, use the following command sequence:

```
>RUN $BRU (RET)
BRU>/VERIFY/INITIALIZE (RET)
From: DMO: (RET)
To: DM1: (RET)
BRU - Starting verify pass

BRU - Completed

BRU> (CTRL/Z)
```

If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new output disk. If the verify operation fails once again, your distribution kit disk is probably defective and should be replaced.

When BRU finishes, the output disk contains a bootstrappable baseline system and is referred to as the target system disk.

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7. Dismount the first distribution kit disk and the copy you just made. For example, if the distribution kit disk is mounted on DMO: and the copy is mounted on DM1:, use the following command sequence:

```
>DMO DM0:/LOCK =UNLOAD (RET)
DMO--TT36:      dismantled from DMO:      *** Final dismount initiated ***
>DMO DM1:/LOCK =UNLOAD (RET)
DMO -- TT36:    dismantled from DM1:      *** Final dismount initiated ***
```

Remove the first distribution kit disk and the copy from their drives, and replace them with the second distribution kit disk and another blank RK07 disk, respectively. Repeat steps 3, 4, 5, and 6 to copy the second distribution kit disk.

### NOTE

If you need to apply Update before performing the system generation and have the RK07 disk Update kit, substitute disk 2 of your RSX-11M-PLUS Version 3.0 distribution kit with the Update kit disk. From this point on, use the Update kit disk as disk 2 of the RSX-11M-PLUS Version 3.0 distribution kit.

When BRU finishes, remove the second distribution kit disk and replace it with the copy of the first distribution kit disk (the target system disk). Write-enable the copy of the distribution kit disk.

At this point, you should set aside your original distribution kit disks for safekeeping. The copies you just made of these disks should be loaded and ready in your RK07 drives, and both disks should be write-enabled.

8. Dismount the target system disk and mount it again, this time using the volume label (RSX11MPBL24) instead of the /FOR switch. Then set your device default to the target system disk device. For example, if your target system disk is DM0:, use the following command sequence:

```
>DMO DM0:/LOCK =NOUNLOAD (RET)
DMO --TT13:      dismantled from DMO:      *** Final dismount initiated ***
>MOU DM0:RSX11MPBL24 (RET)
>ASN DM0:=SY (RET)
```

9. Change your default directory to [2,54]. Then invoke the baseline startup command file, BASTART.CMD. Use the following command sequence:

```
>SET /UIC=[2,54] (RET)
>@BASTART (RET)
```

BASTART.CMD asks a number of questions pertaining to your system. Answer these inquiries appropriately. When BASTART.CMD exits, proceed to Section 2.5 (if you need to apply Update) and then to Chapter 3 for the next steps in the system generation process.

### 2.4.3 Copying Kits on a VAX Host Running VAX-11 RSX

VAX-11 RSX emulates many of the software features of an RSX-11M-PLUS operating system on a VAX host running VAX/VMS. You can use a VAX host computer running VAX-11 RSX to generate an RSX-11M-PLUS system for a PDP-11 target computer.

You must have VAX-11 RSX Version 1.0 installed and running on the VAX/VMS host computer before you can continue with the instructions in this section.

**2.4.3.1 Logging In and Setting Up Privileges** - Before you can begin to copy the distribution kit, you must set certain VMS privileges and terminal characteristics:

- You must have change mode to kernel (CMKRNL) privilege. This allows you to perform a SET /UIC command, which changes your default UIC.
- You must have the system logical name privilege (SYSNAM). This allows you to create system logical names.
- You must have logical I/O privilege (LOG\_IO). This allows VMR to perform logical I/O on system files.
- You must have volume protection privilege (VOLPRO). This allows you to mount volumes with the /FOREIGN keyword for the MOUNT command.
- You must have system protection privilege (SYSPRV). This allows you to create files in other directories.
- You must disable the line editing characteristic for your terminal (SET TERMINAL /NOLINE EDITING). This allows you to enter an escape character to get help from SYSGEN.

Use the following procedure to log in and set up the necessary privileges.

1. Log in on the VAX/VMS system using the /CLI=MCR qualifier so that you can use MCR, because all copying and SYSGEN CLI commands use MCR:

```
Username: SYSTEM/CLI=MCR (RET)
Password: (RET)
```

2. Set up the required privileges using the following command line:

```
>SET PROCESS/PRIVILEGES=(CMKRNL,SYSNAM,LOG IO,VOLPRO,SYSPRV) (RET)
```

3. Disable the line editing characteristic for your terminal using the following command line:

```
>SET TERMINAL /NOLINE EDITING (RET)
```

The following two sections describe procedures for copying the magnetic tape (including the TK50 magnetic tape cartridge distribution kit) and the RK07 distribution kits using a VAX host computer running VAX-11 RSX.

If you have a magnetic tape distribution kit, read Section 2.4.3.2 next. If you have an RK07 disk distribution kit, read Section 2.4.3.3 next.

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**2.4.3.2 Copying the Magnetic Tape Kit Under VAX-11 RSX** - Use the following procedure to copy the 800-bpi or 1600-bpi magnetic tape kits, or the TK50 magnetic tape cartridge kit, using a VAX host computer running VAX-11 RSX. The output disk referred to in this section is the blank disk you intend to use as the target system disk. All commands shown in this section are issued to the MCR command line interpreter.

1. Put the distribution kit tape and the output disk in the appropriate drives. (If you have an 800-bpi tape kit, load the first of the two distribution kit tapes.) If you are not familiar with the procedure for using the tape or disk drives, consult the hardware documentation for the drives.
2. Mount the distribution kit tape and the output disk using the /FOR switch with the MOU command to mount them as foreign volumes. For example, if your distribution kit tape is on MS0: and your output disk is on DR2:, use the following command sequence:

```
>MOU MS0:/FOR (RET)
>MOU DR2:/FOR (RET)
```

3. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output disk is DR2:, use the following command sequence:

```
>BAD (RET)
Device: DR2:/LIST (RET)
```

4. Run the Backup and Restore Utility (BRU) to copy the first backup set on the distribution kit tape to the output disk.

In the BRU command line, you must specify the maximum number of files permitted on and the number of file headers initially allocated to the disk volume to which you are copying the distribution kit tape. To set these values, you need to use the BRU /MAXIMUM and the /HEADERS qualifiers respectively. Table 2-3 gives the appropriate values needed for the arguments to the /MAXIMUM and /HEADERS qualifiers.

Table 2-3  
Disk Initialization Qualifier Values

Device	Value for /MAX Qualifier	Value for /HEADERS Qualifier
RA60	24617	12308
RA80	14591	7295
RA81	54815	51699
RC25	3308	1565
RD52	3719	1859
RD53	8529	4264
RK07	3308	1654
RM02/RM03	8099	4049
RM05	30781	25593
RM80	14923	7461
RP04/RP05	10567	5283
RP06	20956	10478

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For example, if you have a 1600-bpi distribution kit tape mounted on MS0:, and an RM03 output disk mounted on DR2:, use the following command sequence:

```
>BRU (RET)
BRU>/DENSITY:1600/VERIFY/INITIALIZE/MAX:8099/HEADERS:4049 (RET)
From: MS0: (RET)
To: DR2: (RET)

BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Starting verify pass Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed

BRU> (CTRL/Z)
```

If you have an 800-bpi tape kit, alter the argument of the /DENSITY switch to 800 (for example, /DENSITY:800).

If you have a TK50 magnetic tape cartridge kit, do not use the /DENSITY switch in the command line.

If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new output disk. If the verify operation fails once again, your distribution kit tape is probably defective and should be replaced.

When BRU finishes, the output disk contains a bootstrappable baseline system and is referred to as the target system disk.

### NOTE

Do not remove or dismount the distribution kit tape from the drive at this point. The second backup set is automatically copied by the baseline startup command file that you invoke in step 6.

5. Dismount the target system disk and mount it again, this time using the volume label (RSX11MPBL24) instead of the /FOR switch. For example, if your target system disk is DR2:, use the following command sequence:

```
>DMO DR2:/NOUNLOAD (RET)
>MOU DR2:RSX11MPBL24 (RET)
```

6. Change your device default to the target system disk and your default directory to [2,54]. Then invoke the baseline startup command file, BASTART.CMD. Use the following command sequence:

```
>SET DEF DR2: (RET)
>SET /UIC= [2,54] (RET)
>@BASTART (RET)
```

BASTART.CMD asks a number of questions pertaining to your system. Answer these inquiries appropriately. BASTART.CMD then runs BRU to copy the second backup set from the distribution kit tape.

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When BASTART.COMD exits, dismount and unload the distribution kit tape.

```
>DMO MSO:/UNLOAD (RET)
```

Proceed to Section 2.5 (if you need to apply Update) and then to Chapter 3 for the next steps in the system generation procedure.

**2.4.3.3 Copying the RK07 Disk Kit Under VAX-11 RSX** - Use the following procedure to copy the RK07 disk RSX-11M-PLUS distribution kit using a VAX host computer running VAX-11 RSX. The output disk referred to in this section is the blank disk you intend to use as the target system disk. All commands show in this section are issued to the MCR command line interpreter.

### NOTE

This procedure requires two free RK07 drives.  
If your system has only one RK07 drive, you cannot copy your RK07 kit on that system.

1. Put the first distribution kit disk and a blank RK07 disk in your RK07 drives, and then write-protect the distribution kit disk. If you are not familiar with the procedure for using RK07 disk drives, consult the hardware documentation for the drives.
2. Mount the distribution kit disk and the output disk, using the /FOR switch with the MOU command to mount the disks as foreign volumes. For example, if your distribution kit disk is DMO: and your output disk is DM1:, use the following command sequence:

```
>MOU DMO:/FOR (RET)  
>MOU DM1:/FOR (RET)
```

3. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output disk is DM1:, use the following command sequence:

```
>BAD (RET)  
Device: DM1:/LIST (RET)
```

4. Run the Backup and Restore Utility (BRU) to copy the distribution kit disk to the output disk. For example, if the distribution kit disk is mounted on DMO: and the output disk is mounted on DM1:, use the following command sequence:

```
>BRU (RET)  
BRU> /VERIFY/INITIALIZE (RET)  
From: DMO: (RET)  
To: DM1: (RET)  
BRU - Starting verify pass  
  
BRU - Completed  
  
BRU> (CTRL/Z)
```

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If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new output disk. If the verify operation fails once again, your distribution kit disk is probably defective and should be replaced.

When BRU finishes, the output disk contains a bootstrappable baseline system and is referred to as the target system disk.

5. Dismount the first distribution kit disk and the copy you just made. For example, if the distribution kit disk is mounted on DM0: and the copy is mounted on DM1:, use the following command sequence:

```
>DMO DM0:/UNLOAD (RET)
>DMO DM1:/UNLOAD (RET)
```

Remove the first distribution kit disk and the copy from their drives, and replace them with the second distribution kit disk and another blank RK07 disk, respectively. Repeat steps 2, 3, and 4 to copy the second distribution kit disk.

### NOTE

If you need to apply Update before performing the system generation and have the RK07 disk Update kit, substitute disk 2 of your RSX-11M-PLUS Version 3.0 distribution kit with the Update kit disk. From this point on, use the Update kit disk as disk 2 of the RSX-11M-PLUS Version 3.0 distribution kit.

When BRU finishes, remove the second distribution kit disk and replace it with the copy of the first distribution kit disk (the target system disk). Write-enable the copy of the distribution kit disk.

At this point, you should set aside your original distribution kit disks for safekeeping. The copies you just made of these disks should be loaded and ready in your RK07 drives and both disks should be write-enabled.

6. Dismount the target system disk and mount it again, this time using the volume label (RSX11MPBL24) instead of the /FOR switch. Then set your device default to the target system disk device. For example, if your target system disk is DM0:, use the following command sequence:

```
>DMO DM0:/NOUNLOAD (RET)
>MOU DM0:RSX11MPBL24 (RET)
>SET DEF DM0: (RET)
```

7. Set your default directory to [2,54]. Then invoke the baseline startup command file, BASTART.CMD. For example:

```
>SET /UIC=[2,54] (RET)
>@BASTART (RET)
```

BASTART.CMD asks a number of questions pertaining to your system. Answer these inquiries appropriately.

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8. When BASTART.CMD exits, dismount the second distribution kit disk. Do not remove the disk from the drive if you intend to proceed with SYSGEN immediately. For example:

```
>DMO DM1:/NOUNLOAD (RET)
```

Proceed to Section 2.5 and (if you need to apply Update) then to Chapter 3 for the next steps in the system generation process.

### 2.5 THE UPDATE PROCEDURE

This section explains how to use the Update package you have received to apply corrections to your RSX-11M-PLUS Version 3.0 operating system and layered product software.

The **Update package** consists of two groups of software: the **Update kit** and the **layered product files**. Depending on which type of Update package you receive, the two groups of software are supplied on one or two pieces of magnetic media.

The **Update kit** is a set of files used to apply corrections to your RSX-11M-PLUS Version 3.0 operating system software. These corrections are cumulative; each Update contains all the corrections that have been generated since the release of RSX-11M-PLUS Version 3.0. Included in the Update kit is an interactive procedure that applies Update to your operating system software.

The **layered product files** are used to apply corrections to some of the layered products (such as languages and DECnet) that run on RSX-11M-PLUS. Section 2.5.7 explains how to locate the instructions for applying these files to the layered software products.

This section explains how to use the Update kit and how to locate instructions for applying the layered product files.

If you are installing an RSX-11M-PLUS system for the first time, keep in mind that you must apply Update **before** you invoke SYSGEN to generate your system.

#### 2.5.1 THE UPDATE PACKAGE

The Update package you received is one of four types:

- Magnetic tape, either 800 or 1600 bpi
- TK50 magnetic tape cartridge
- RK07 disk
- RL02 pregenerated disk

The magnetic tape and RK07 disk packages are similar, and are treated together in the following sections.

The RL02 disk package consists of an Update kit disk and a second disk that contains the layered product files. The Update kit disk contains an RSX-11M-PLUS system which the RSX-11M-PLUS operating system corrections have already been applied. The Update kit disk, then, replaces your RSX-11M-PLUS Version 3.0 pregenerated system kit disk.

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If you have the RL02 disk Update package, you should skip directly to Section 2.5.6 without reading further in this section.

The Update package contains the Update kit and the layered product files.

The software in the Update kit falls into three categories:

- Update procedure command file - the indirect command file that controls the Update procedure
- Replacement files - the updated or new libraries and files that replace libraries and files on your RSX-11M-PLUS distribution kit
- Correction files - the files (.COR file type) used to create the updated source files (.MAC file type) that the Update procedure applies

The layered product files are used to apply corrections to certain layered products that run on RSX-11M-PLUS. For a list of the layered product files contained in the Update and instructions on using them, see the RSX-11M-PLUS Update Notes.

### 2.5.2 HOW UPDATE WORKS

Update is the name for a command procedure that applies corrections to your RSX-11M-PLUS Version 3.0 operating system software.

The Update procedure copies the replacement files in the Update kit to a disk containing a copy of your RSX-11M-PLUS Version 3.0 distribution kit. You use the updated distribution kit disk to generate a new RSX-11M-PLUS system.

The Update kit is cumulative. Each revision of the Update kit contains all corrections that have been produced since the last full release of RSX-11M-PLUS.

You must apply this Update to an unaltered copy of the RSX-11M-PLUS Version 3.0 distribution kit or the corrections will not be properly integrated with the other system software components, and your system will not work.

**2.5.2.1 The Update Command Procedure** - An indirect command file named UPDATE.CMD is contained on your original RSX-11M-PLUS Version 3.0 distribution kit disk in directory [200,200]. When you begin the Update procedure by invoking UPDATE.CMD, the file UP.CMD is copied from the Update kit medium to a disk that contains a copy of your RSX-11M-PLUS Version 3.0 distribution kit. UPDATE.CMD invokes UP.CMD, which then copies the replacement files to your distribution kit disk. When this copying is complete, the Update has been applied and you have a target system disk containing all the necessary files to produce an updated RSX-11M-PLUS system. You must then invoke the SYSGEN procedure to generate the updated RSX-11M-PLUS system.

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**2.5.2.2 Replacement Files** - The replacement files are the updated files that incorporate the latest corrections to your RSX-11M-PLUS system. The Update procedure copies these replacement files to your target system disk. When you perform a new system generation, you create an updated system containing the corrections and new software features supplied in this Update.

**2.5.2.3 Source Correction Files** - The Update kit also contains the source correction files (.COR file type) that were used to create some of the replacement files used by the Update procedure. They are located in a separate backup set called MPV30COR. These files are included to document the changes made by this Update to those portions of the system software for which MACRO-11 source code is supplied on the RSX-11M-PLUS Version 3.0 distribution kit.

In most circumstances, you do not need these files. If your application requires it, you may edit the correction files to include your own corrections and then apply the edited correction files manually to produce updated source files.

### 2.5.3 PREPARING FOR UPDATE

Your RSX-11M-PLUS Version 3.0 distribution kit is one of four types:

- Magnetic tape kit, either 800 or 1600 bpi
- TK50 magnetic tape cartridge
- RK07 disk kit
- RL02 pregenerated disk kit

**2.5.3.1 Hardware Required for Applying Update** - If you have the magnetic tape RSX-11M-PLUS Version 3.0 distribution kit and any of the supported target system disks except the RK07, you need one magnetic tape drive and one disk drive of the same type as your target system disk. (For a list of the supported target system disks, see Section 2.1.1.)

If you have the RK07 disk RSX-11M-PLUS Version 3.0 distribution kit and the magnetic tape Update kit, you need one magnetic tape drive and two RK07 disk drives.

If you have the RK07 disk RSX-11M-PLUS Version 3.0 distribution kit and the RK07 disk Update kit, you need two RK07 disk drives.

If you have the RL02 disk Update kit, you should have already skipped to Section 2.5.6.

If you are using a VAX/VMS system as the host system for applying Update and running SYSGEN, follow the instructions in Section 2.5.8.

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**2.5.3.2 Copying the RSX-11M-PLUS Version 3.0 Distribution Kit -** Before you apply Update, you must create a disk copy of the unaltered RSX-11M-PLUS Version 3.0 distribution kit. This must not be a copy on which you have run SYSGEN, but a copy made directly from the RSX-11M-PLUS Version 3.0 distribution kit.

The paragraphs that follow refer you to Section 2.4 for step-by-step instructions for making copies of the distribution kit media. You should follow those instructions carefully, including the steps concerning the baseline startup command file, BASTART.CMD. If you do not follow the steps in this manual, your Update may be applied incorrectly.

If you have the magnetic tape RSX-11M-PLUS Version 3.0 distribution kit, copy the RSX-11M-PLUS Version 3.0 distribution kit tape (or tapes) onto a blank disk, following the step-by-step instructions contained in Section 2.4.

If you have the RK07 disk RSX-11M-PLUS Version 3.0 distribution kit and the magnetic tape Update kit, copy both distribution kit disk 1 and disk 2 of the RSX-11M-PLUS Version 3.0 distribution kit onto blank RK07 disks, following the step-by-step instructions contained in Section 2.4.

If you have the RK07 disk RSX-11M-PLUS Version 3.0 distribution kit and the RK07 disk Update disk, copy disk 1 of the RSX-11M-PLUS Version 3.0 distribution kit and the Update disk onto blank RK07 disks, following the step-by-step instructions contained in Section 2.4.

If you have the RL02 disk Update kit, you should have already skipped to Section 2.5.6.

After you have finished copying your RSX-11M-PLUS Version 3.0 distribution kit to disk, proceed to Section 2.5.4.

### 2.5.4 APPLYING UPDATE

The Update procedure executes on a running RSX-11M-PLUS system.

If you have access to a system already running RSX-11M-PLUS, you may use that system to apply Update on line. An on-line system is one on which other activity may occur and on which other users may be logged in.

If you do not have access to a system already running RSX-11M-PLUS, you must use the baseline system provided on the RSX-11M-PLUS Version 3.0 distribution kit to apply Update to a stand-alone system. A stand-alone system is one that is running on the baseline system, but on which you are the only user.

If you are applying an Update for the first time, you should read through Chapters 1 and 2 of this manual and the Update Notes before you invoke the Update procedure. If you understand the Update procedure and the system generation procedure thoroughly before you begin, you will be better prepared to avoid mistakes along the way.

When you are ready to apply the Update, use the following procedure:

1. Load the Update kit medium (disk or tape) and the target system disk on the appropriate drives.
2. If you are applying Update using a stand-alone RSX-11M-PLUS system, skip to step 6.

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3. Log in to a privileged, account on the on-line RSX-11M-PLUS system, and make sure that your CLI is set to MCR and that you are in a numbered directory (for example, directory [7,100]).
4. Allocate and mount the target system disk. For example, if your target system disk is loaded in DR1:, use the following command sequence:

```
>ALL DR1: (RET)
>MOU DR1:RSX11MPBL24/VI (RET)
```

5. Skip to step 7.
6. Hardware bootstrap the target system disk. This brings the baseline system into memory. When the baseline system comes up, it prints an identification line on your terminal and invokes the baseline startup command file, which asks a number of questions pertaining to your system. Answer these inquiries appropriately. When the baseline startup command file finishes, proceed to step 7.
7. Assign logical device SY: to the target system disk. For example, if your target system disk is spinning in DR1:, use the following command line:

```
>ASN DR1:=SY (RET)
```

8. Set your default UIC and directory to [200,200]:

```
>SET /UIC=[200,200] (RET)
>SET /DEF=[200,200] (RET)
```

9. Invoke the Update indirect command file:

```
>@UPDATE (RET)
```

**2.5.4.1 Applying Update on VAX Host Running VAX-11 RSX** - Before you apply Update, you should have made a copy of your distribution kit following the instructions in Section 2.4.

If you are applying an Update for the first time, you should read through the Update Notes before you invoke the Update procedure. If you understand the Update procedure thoroughly before you begin, you will be better prepared to avoid mistakes along the way.

When you are ready to apply the Update, use the following procedure:

1. If you have a **magnetic tape** Update kit, load the Update tape into the appropriate drive. Do not mount the tape.  
  
If you have an **RK07 disk** Update kit, load the Update disk into the appropriate drive. Do not mount the disk.
2. If it is not mounted already, mount your target system disk. For example, if your target system disk is DR0:, use the following command sequence:

```
>MOU DR0:RSX11MPBL24 (RET)
```

## GETTING STARTED

3. Set your default device to the target system disk. For example, if your target system disk is DRO:, use the following command sequence:

```
>SET DEF DRO: (RET)
```

4. Set your default UIC and directory to [200,200] and invoke the Update command file, UPDATE.CMD. For example:

```
>SET /UIC=[200,200] (RET)
>@UPDATE (RET)
```

The Update procedure then prints out instructions and questions.

If you encounter errors in the course of the Update procedure, see Section 2.5.5 for help in correcting the errors.

When you have applied the Update, proceed to Chapter 3 for the next step in the system generation procedure.

**2.5.4.2 Update Examples** - The following examples are similar to what you will see on your terminal. Use the examples as guides to how you should proceed. There may be some minor differences (if any) between the examples and what appears on your terminal, depending on whether you are applying Update to a stand-alone or on-line system, or whether tasks such as BRU are installed in your system.

The following is a list of the three examples and the sections of this guide in which they are contained:

- Magnetic tape Update kit, with a RP04/05/06, RM02/03/05/80, or RA60/80/81 disk as the target system disk (Section 2.5.4.2.1)
- Magnetic tape Update kit, with the original RSX-11M-PLUS Version 3.0 distribution kit on magnetic tape and with an RK07 as the target system disk (Section 2.5.4.2.2)
- RK07 disk Update kit, with the original RSX-11M-PLUS Version 3.0 distribution kit on an RK07 disk and an RK07 as the target system disk (Section 2.5.4.2.3)

Study the example that matches your combination of RSX-11M-PLUS Version 3.0 distribution kit medium and Update kit medium.

If you encounter errors in the course of the Update procedure, see Section 2.5.5 for help in correcting the errors.

When you have applied Update, you must perform a complete SYSGEN to generate an updated RSX-11M-PLUS Version 3.0 system.

When you have generated a new RSX-11M-PLUS system, see Section 2.5.7 for information on applying the layered product files.

If you have generated RSX-11M-PLUS Version 3.0 systems before and are familiar with the process, you can invoke the SYSGEN procedure automatically by answering Yes when the Update procedure asks the following question:

```
>* Do you want to continue with the SYSGEN? [Y/N]:
```

If you are installing RSX-11M-PLUS for the first time, or if you are not sufficiently familiar with the RSX-11M-PLUS system generation procedure, answer No to the preceding question and read Chapter 3 before you continue.

## GETTING STARTED

**2.5.4.2.1 Magnetic Tape Update Kit Example** - The following is an example of a terminal trace produced by a user applying Update using the magnetic tape Update kit and any of the supported target system disks except the RK07. (For a list of the supported target system disks, see Section 2.1.1.)

This procedure requires one magnetic tape drive and one disk drive.

In this example, an 800-bpi. Update kit tape is loaded in drive MMO: and the target system disk is loaded in DRO:.

The first part of the terminal trace (the part that results from performing Steps 1 through 6 in Section 2.5.4) has been omitted because what appears on your terminal differs depending on whether you are applying Update on line or to a stand-alone system.

```
>ASN DRO:=SY: (RET)
>SET /UIC=[200,200] (RET)
>@UPDATE (RET)
>;
>;          RSX-11M-PLUS Version 3.0 UPDATE PROCEDURE
>;
>; This command file initiates the Update Procedure for RSX-11M-PLUS V3.0.
>; It will copy all of the files necessary to bring your system up to
>; the current patch level from the update device onto the disk which
>; will contain the new system. When this copying is complete, it may be
>; necessary to perform a SYSGEN to build a system incorporating the new
>; software.
>;
>TIM
17:09:31 12-JUN-1985
>;
>;
>; Enter the device containing the Update media. This must be
>; either a tape or an RK07 disk and should NOT be mounted.
>;
>* Enter device containing Update kit [S]:  MMO: (RET)
>;
>; Enter a device containing the system to be updated. This device
>; must be mounted FILES-11.
>;
>* Enter device containing system to receive patches [S]:  DRO: (RET)
>SET /UIC= [1,11]
>;
>; The previous contents of the update work directory are now deleted
>;
>PIP DRO:[1,11]*.*;*/DE/NM
>;
>; Read the update command file from the update device
>;
>* Is Update tape on MMO: written at 1600 bpi? [Y/N] : N (RET)
>;
>; Mount the tape foreign for access by BRU
>;
>MOU MMO:/FOR/DENS=800
>;
>; Read the command file that will apply the Update from the tape
>;
>BRU/REW/NOINIT/DEN:800  MMO: DRO:
BRU - Starting Tape 1 on MMO:

BRU - End of Tape 1 on MMO:

BRU - Completed
```

## GETTING STARTED

```
>; Execute the file just copied onto the new system disk.  
>; This file will actually install the Update.
```

```
.  
.  
.
```

```
[At this point, Update starts reading and applying the actual update files.  
Any comments displayed are particular to the Update you are running.]
```

```
.  
.  
.
```

```
>; Dismount the Update device  
>DMO MM0:  
DMO -- TT36:   dismounted from MM0:   *** Final dismount initiated ***  
  
>; The Update has been successfully copied onto the new system disk.  
>; It may now be necessary to do a SYSGEN to build a system incorporating the  
>; patches.  
  
>* Do you want to continue with the SYSGEN? [Y/N]: N (RET)  
>SET /UIC=[200,200]  
>@ <EOF>
```

### 2.5.4.2.2 Magnetic Tape Update Kit with RK07 Target System Disk

**Example** - The following is an example of a terminal trace produced by a user applying Update using the magnetic tape Update kit and an RK07 target system disk.

This procedure requires one magnetic tape drive and two RK07 disk drives.

In this example, a 1600-bpi Update kit tape is loaded in drive MM0: and the target system disk is loaded in drive DM0:.

The first part of the terminal trace (the part that results from performing Steps 1 through 6 in Section 2.5.4) has been omitted, because what appears on your terminal differs depending on whether you are applying Update on line or to a stand-alone system.

```
>ASN DM0: =SY: (RET)  
>SET /UIC=[200,200] (RET)  
>@UPDATE (RET)  
  
>;      RSX-11M-PLUS Version 3.0 UPDATE PROCEDURE  
>;  
>; This command file initiates the Update Procedure for RSX-11M-PLUS V3.0.  
>; It will copy all of the files necessary to bring your system up to  
>; the current patch level from the update device onto the disk which  
>; will contain the new system. When this copying is complete, it may be  
>; necessary to perform a SYSGEN to build a system incorporating the new  
>; software.  
  
>TIM  
18:14:31 12-JUN-1985
```

## GETTING STARTED

```
>; Enter the device containing the Update media. This must be
>; either a tape or an RK07 disk and should NOT be mounted.

>* Enter device containing Update kit [S]: MM0: RET

>; Enter a device containing the system to be updated. This device
>; must be mounted FILES-11.

>* Enter device containing system to receive patches [S]: DM0: RET
>UFD DMO:[1,11]/PRO=[RWED,RWED,RWED,RWED]
>SET /UIC= [1,11]

>; The previous contents of the Update work directory are now deleted

>PIP DMO: [1,11] * .*; */DE/NM

>; Read the update command file from the update device

>* Is Update tape on MM0: written at 1600 bpi? [Y/N]: Y RET

>; Mount the tape foreign for access by BRU

>MOU MM0:/FOR/DENS=1600

>; Read the command file that will apply the Update from the tape

>BRU/REW/NOINIT/DEN:1600 MM0: DMO:
BRU - Starting Tape 1 on MM0:

BRU - End of Tape 1 on MM0:

BRU - Completed

>;

>; Execute the file just copied onto the new system disk.
>; This file will actually install the Update.

      .
      .
      .

[At this point, Update starts reading and applying the actual update files.
Any comments displayed or questions asked apply to the Update you are running.]

      .
      .
      .

>; Dismount the Update device
>;
>DMO MM0:
DMO -- TT36:   dismounted from MM:      *** Final dismount initiated ***

>; The Update nas been successtully copied onto the new system disk.
>; It may now be necessary to do a SYSGEN to build a system incorporating the
>; patches.

>* Do you want to continue with the SYSGEN? [Y/N]: N RET
>SET /UIC=[200,200]
>@ <EOF>
```

## GETTING STARTED

### 2.5.4.2.3 RK07 Disk Update Kit with RK07 Disk Target System Disk

**Example** - The following is an example of the terminal trace that results from applying Update using the RK07 disk Update kit and a copy of the RSX-11M-PLUS Version 3.0 RK07 disk distribution kit.

This procedure requires two RK07 disk drives.

In this example, the Update kit disk is loaded in drive DM0: and the target system disk is loaded in drive DM1:.

The following procedure copies the correction files to the target system disk, which is a copy of disk 1 of the original RSX-11M-PLUS Version 3.0 distribution kit. After you have used the copy of the Update kit disk to apply the correction files, use it as the updated disk 2 of your distribution kit since the Update kit disk contains all the updated MACRO-11 source files.

The first part of the terminal trace (the part that results from performing Steps 1 through 6 in Section 2.5.4 has been omitted, because what appears on your terminal differs depending on whether you are applying Update on line or to a stand-alone system.

```
>ASN DM1:=SY: (RET)
>SET /UIC=[200,200] (RET)

>;      RSX-11M-PLUS Version 3.0 UPDATE PROCEDURE

>; This command file initiates the Update Procedure for RSX-11M-PLUS V3.0.
>; It will copy all of the files necessary to bring your system up to
>; the current patch level from the update device onto the disk which
>; will contain the new system. When this copying is complete, it may be
>; necessary to perform a SYSGEN to build a system incorporating the new
>; software.

>TIM
19:01:42 12-JUN-1985

>; Enter the device containing the Update media. This must be
>; either a tape or an RK07 disk and should NOT be mounted.

>* Enter device containing update kit [S]:  DM0:  (RET)

>; Enter a device containing the system to be updated. This device
>; must be mounted FILES-11.
>;
>* Enter device containing system to receive patches [S]:  DM1:  (RET)
>SET /UIC= [ 1,11]

>; The previous contents of the update work directory are now deleted

>PIP DM1:[1,11]* .*;*/DE/NM

>; Read the update command file from the update device

>; Mount the RK07 disk containing the Update

>MOU DM0:/OVR/VI
Volume Information
Class:      Files-11
Device:     DM00
Volume label:MPLUSBL24SRC
Pack serial: 00013407007
Owner:      [1,1]
Protection: [ RWCD,RWCD,RWCD,RWCD]
```

## GETTING STARTED

Default: [RWED,RWED,RWED,R]  
Processor: F11ACP

>; Copy the command file to apply the Update from the RK07

>PIP DM1:/NV=DM0:UP.CMD

>; Execute the file just copied onto the new system disk.  
>; This file will actually install the Update.

·  
·  
·

[At this point, Update starts reading and applying the actual update files.  
Any comments displayed are particular to the Update you are running.]

·  
·  
·

>; Dismount the Update device

>DMO DM0:  
DMO -- TT36:   dismounted from DM0:       \*\*\* Final dismount initiated \*\*\*

>; The Update has been successfully copied onto the new system disk.  
>; It may now be necessary to do a SYSGEN to build a system incorporating the  
>; patches.

>\* Do you want to continue with the SYSGEN? [Y/N]: N (RET)  
>SET /UIC=[200,200]  
>@ <EOF>

### 2.5.5 ERRORS DURING UPDATE

There are some errors from which Update attempts to recover, such as the inability to mount a disk. When such an error is encountered, Update asks you what action you would like to take.

The following is an example of the text that the Update procedure prints if a recoverable error occurs:

>; An error has occurred that prevents the Update procedure from  
>; working correctly.

>; If you know what caused the error, correct the error, then  
>; either continue with the Update procedure or abort the Update  
>; procedure and begin again.

>; See the RSX-11M-PLUS System Generation and Installation Guide  
>; for more information on identifying and correcting errors.

>; You may choose one of the following options:

>;       A -> Abort and exit from the Update procedure  
>;       C -> Continue with the Update procedure without  
>;               repeating the command that caused the error

## GETTING STARTED

```
>;      P -> Pause while you attempt to resolve the problem
>;      R -> Repeat the command that caused the error
>;
>* Which option do you choose (A, C, P, or R)? [S]
```

If you enter "A," Update dismounts the target system disk and exits. Choose this option if you do not understand the circumstances surrounding the error and you wish to terminate the Update procedure. If you choose this option, Update prints the following messages on your terminal:

```
>;
>; Refer to the instructions in the RSX-11M-PLUS System Generation and
>; Installation Guide for installing this Update kit to make certain
>; you have not skipped a step or overlooked something.
>;
>; If you cannot identify and resolve the problem, please contact
>; your local DIGITAL software specialist for further assistance.
>;
>TIM
17:09:31 12-JUN-1985
>;
>; Now dismounting the Update kit device and exiting...
>;
>DMO MM:
DMO -- TT36:      dismantled from MM0:      *** Final dismount initiated ***
>;
>SET /UIC=[200,200]
>@<EOF>
>
```

If you choose "C," Update continues with the next command and ignores the error. You might choose this option if the Update procedure's attempt to mount the Update kit disk failed because the kit disk was already properly mounted.

If you choose "P," the Indirect Command Processor pauses until you instruct it to continue by issuing the UNS command. You might choose this option if mounting the Update kit failed because you had the kit mounted, but not properly for Update, and you want to dismount the kit and then have Update reissue the MOU command. When you restart the Indirect Command Processor by using the UNS command, the option question is repeated so that you may choose the "C" or the "R" option.

The following is the text that Update prints when you use the "P" command to pause:

```
>;
>; The Update procedure will now pause to let you attempt to
>; resolve the problem. Please UNStoP the indirect command file
>; processor when the problem has been resolved.
>;
AT.T0 -- Pausing. to continue type "UNS AT.<ESC>"
```

If you choose "R," Update repeats the command that failed. You might choose this option if mounting the Update kit failed because you specified a device that did not contain the Update kit, but the kit is now ready to be read from the specified device.

## GETTING STARTED

### 2.5.6 UPDATE AND THE RL02 PREGENERATED DISTRIBUTION KIT

If you have an RL02 pregenerated distribution kit, the Update kit disk you receive is a replacement for your original RL02 distribution kit disk.

The Update disk contains a fully corrected version of the RL02 pregenerated system. All the software corrections that the Update procedure normally applies have been applied, as well as some corrections that are unique to the RL02 pregenerated system kit. You cannot apply any corrections to the RSX-11M-PLUS software on the pregenerated kit.

First make a copy of the Update kit disk you received, using the copying procedure found in Section 5.2.2. Use the copy to replace your present RL02 system disk. Keep the Update disk stored in a safe place in case the copy is corrupted or destroyed.

Along with the Update disk, you receive a second RL02 disk containing the layered product files. See Section 2.5.7 for information on using the layered product files.

### 2.5.7 LAYERED PRODUCT FILES

The Update package also includes files to update certain layered products.

In the magnetic tape Update packages, the layered product files are on the Update tape in the form of additional backup sets. In the RK07 and RL02 disk Update packages, the layered product files are in directories on the second disk (disk 2).

There is a documentation file (.DOC file type) for each layered product that explains how to apply the corrections to that layered product. Read the documentation files for each layered product that you have on your system.

You should apply any corrections to layered products **after** you use the SYSGEN procedure to generate a new system that incorporates the Update corrections. The layered products require the corrected versions of certain files (for example, SYSLIB.OLB) that are produced during the system generation procedure.

If you are installing an RSX-11M-PLUS system for the first time, turn now to Chapter 3 for instructions on performing a system generation.

**2.5.7.1 Accessing the Corrections with the Magnetic Tape Package** - If you have the magnetic tape Update package, the files for each product are contained in a separate BRU backup set on the Update kit tape. You must restore the backup set from the tape to the disk before you can apply the layered product files. Use the BRU Utility to restore the backup set to disk, and then type or print the appropriate documentation file for further instructions.

You can display an instruction file at your terminal using the following command line, replacing ddnn: with the name of the drive containing the Update kit and replacing [ggg,mmm] with the appropriate directory specification as listed in the RSX-11M-PLUS Update Notes:

```
PIP TI:=ddnn:[ggg,mmm]product.DOC
```

## GETTING STARTED

The following example explains how to restore the BRU backup set for PDP-11 FORTRAN-77/RSX. For other layered products, substitute the correct backup set name.

To restore a backup set, mount the Update kit magnetic tape as a foreign volume and copy the backup set using BRU. For example, if the Update tape is loaded on drive MMO: and the disk to which you wish to copy the PDP-11 FORTRAN-77/RSX backup set is DMO: (an RK07 mounted as a Files-11 volume), use the following command sequence:

```
>MOU MMO:/FOR   
>BRU /NOINI/UFD/DENS:1600/SUPER/BAC:F77 MMO: DMO: 
```

If you have an 800-bpi Update kit tape, substitute /DENS:800 in the command line above.

**2.5.7.2 Accessing the Corrections on RK07 or RL02 Disk Update Packages** - If you have the RK07 disk Update package, mount the Update disk as a Files-11 volume and type or print the appropriate documentation file.

If you have the RL02 disk Update package, mount the second RL02 disk as a Files-11 volume and type or print the appropriate documentation file.

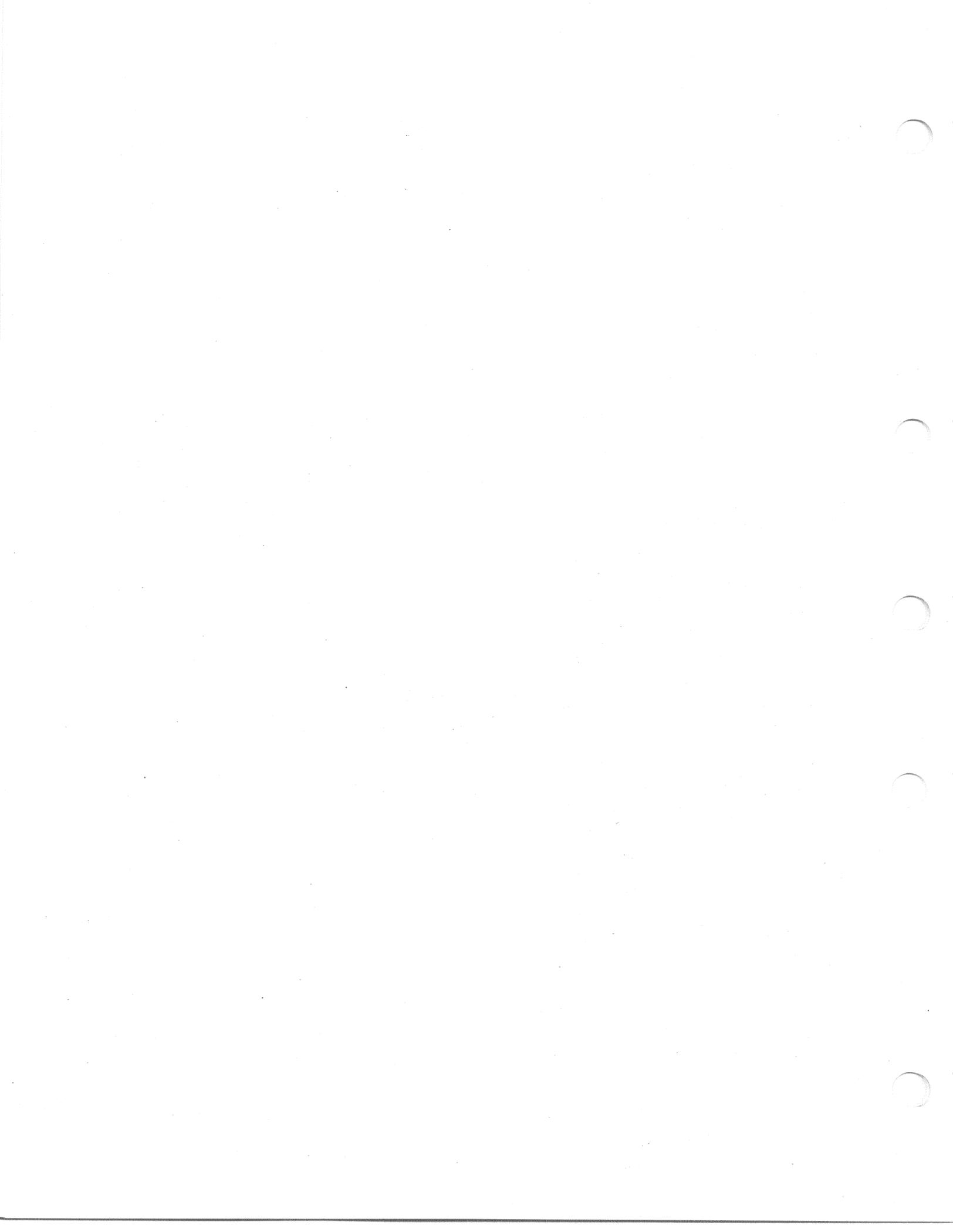
You can display an instruction file at your terminal using the following command line, replacing ddnn: with the name of the drive containing the Update disk and replacing [ggg,mmm] with the appropriate directory specification as listed in the RSX-11M-PLUS Update Notes

```
PIP TI: =ddnn: [ggg,mmm] product.DOC
```

You can copy the contents of selected directories to disk by creating the necessary directories using the MCR command UFD, and then using PIP. For example, to copy the contents of directory [252,200] from an RK07 Update disk mounted on DM1: to your system disk mounted on DMO:, use the following command sequence:

```
>UFD DMO: [252,200]   
>PIP DMO: [252, 200]/CD/FO/SU=DM1:[252,200] 
```

Refer to the RSX-11M-PLUS Update Notes for a list of the directories that contain the various layered product files.



CHAPTER 3  
RUNNING SYSGEN

3.1 WHAT YOU SHOULD KNOW BEFORE YOU START

This section contains general information concerning SYSGEN format, conventions, and features.

3.1.1 Format of SYSGEN Questions

The Indirect Command Processor determines the format that SYSGEN questions take. Generally, SYSGEN questions begin with an asterisk followed by the question number, the text of the question, and a prompt (contained within brackets) indicating the type of response required.

Question numbers consist of two characters designating the section of SYSGEN followed by a number designating the particular question in that section (for example, SU010). The following are the 2-character designators for each section:

SU	Choosing SYSGEN Options
CE	Choosing Executive Options
CP	Choosing Peripheral Configuration
AE	Assembling the Executive and Drivers
BE	Building the Executive and Drivers
BP	Building the Privileged Tasks
BN	Building the Nonprivileged Tasks
CS	Creating the System Image File

The questions are numbered sequentially, but not consecutively. You can use question numbers for looking up a particular question in this chapter; the question numbers printed by SYSGEN are the same as the ones in this chapter.

The prompt at the end of each SYSGEN question indicates the type of response that is required, the range of acceptable responses, and the default response.

SYSGEN questions require a response in one of the following ways:

- An ASCII string response
- A logical response -- Y (for yes) or N (for no)
- A numeric response

## RUNNING SYSGEN

Most SYSGEN questions have an implied response, known as the default. The default is the value assumed by SYSGEN if an option is not explicitly specified. Many of the SYSGEN questions contain the default response within brackets immediately following the text of the question. How the default response appears in a given question depends on the type of response required for that question (ASCII string, logical, or numeric).

Press the RETURN key without entering any characters to select the default response for any SYSGEN question (unless the explanatory text that accompanies the question explicitly states that there is no default for that question).

The following is a typical SYSGEN question requiring an ASCII string response:

\* CE010 What is your target processor type? [S R:5.-12. D:"11/44"]:

The first key letter (S) inside the brackets indicates that the response should be an ASCII string -- in this case, a processor type. The second key letter (R) indicates that the range or number of characters allowed in the response is from 5 to 12(decimal). The third key letter (D) indicates that the default response is "11/44". Pressing the RETURN key without entering any characters enters the default response.

The following is a typical SYSGEN question requiring a Yes or No response:

\* CE270 Do you want to include XDT? [Y/N D:N]:

The prompt "Y/N" at the end of the question indicates that the response should be either a Y (for yes) or an N (for no). The default response for this example is No, but Yes/No questions can also have a default response of Yes.

The following is a typical SYSGEN question requiring a numeric response:

\* CP0836 What is the physical unit number of DB2:? [O R:0-7 D:2]:

The prompt "R:0-7" at the end of the question indicates that the question requires a numeric response. The first key letter (O) inside the bracket indicates that the response is an octal number. A key letter of "D" in this position indicates that the response is a decimal number. The second key letter (R) indicates that the range for the response is from 0 through 7. The third key letter (D) indicates that the default response is 2.

If you are not certain how to answer a particular question, take the default by pressing the RETURN key without entering any characters. The defaults have been chosen so that they will produce acceptable results with most systems. You can change your answer and perform another SYSGEN later. It is easier to generate a simple, working system first, and then to tailor that system by performing additional system generations later when you have gained experience and familiarity with SYSGEN and RSX-11M-PLUS.

If you answer a question with an incorrect value, SYSGEN displays a message describing the error and suggests a procedure to correct the problem. The question then appears again on your terminal.

### 3.1.2 How to Get Help

All the questions posed during SYSGEN have associated help paragraphs. You can, if you choose, have the help paragraphs printed on your terminal before each question is asked by entering Yes to the following question:

\* SU010 Do you always want the explanation printed?

If you feel sufficiently familiar with the SYSGEN procedure and do not choose to have the help paragraphs automatically printed, you may still examine the help paragraphs for any question by pressing the ESC key in response to the question. SYSGEN then prints the help paragraphs and asks the question again.

Other manuals in the RSX-11M-PLUS documentation set contain information that is relevant to system generation. Where appropriate, this manual contains pointers to specific manuals and, sometimes, to chapters within those manuals.

### 3.1.3 What to do if you Make a Mistake

If you enter a response out of the proper range for a specific question or set of questions, or if you choose options that are incompatible, SYSGEN prints an error message on your terminal.

If the message is labeled as a warning, take appropriate action as described in the error message, or simply note the content of the message for later reference.

If the message is labeled as fatal, SYSGEN exits. After correcting the condition that caused the error, you can restart SYSGEN by doing the following:

1. Change your default directory back to [200,200] using the following command line:

```
>SET /UIC= [200,200] (RET)
```

2. Check to see whether the saved answer files are usable (see Section 3.1.4). If they are not, delete them.

Invoke SYSGEN:

```
>@SYSGEN (RET)
```

#### NOTE

If you exit from the SYSGEN procedure by pressing CTRL/Z, you may render the current saved answer files unsuitable for future use. For more information on dealing with saved answer files, see Section 3.1.4.

If you are performing a PREPGEN (as you should before actually generating a system) and you make a mistake, you can redo the PREPGEN and correct the mistake. When you run the PREPGEN the second time, use the saved answer files for those sections that are correct; do not use the saved answer file for the section in which you made the mistake. See Section 3.1.5 for information on performing a PREPGEN.

## RUNNING SYSGEN

If you do not discover a mistake until after you have completed SYSGEN, you may still be able to correct the mistake without performing another complete SYSGEN.

Most of your answers in the Choosing Executive Options section govern conditionally assembled code in the Executive and therefore cannot be changed without performing another SYSGEN. However, you can make changes to the following:

- The Queue Manager can be task built and added to the system at any time.
- The batch processor can be task built and added to the system if virtual terminal support and the Queue Manager have been included.
- Either version of the file system ACP (FCPMDL or FCPLRG) can be task built and added to the system at any time.
- Your answer to the memory size question is not crucial. The size you specify is used as the size of the unsaved system. Once the system is bootstrapped and saved, the actual memory size is determined and used.
- If you choose floating point processor support, the system will run on processors with or without a floating point unit.

If you made a mistake in the answers that you gave to the following questions in the Choosing Peripheral Configuration (CP) section, you can correct the mistake after you have completed SYSGEN:

- SYSGEN asks for the CSR and vector addresses of every controller in your system. If you specify a wrong address, you can change it after your system image file has been created by using the VMR CON command.
- SYSGEN asks for the drive type for many of the disk units. For example:

\* CP0860 Is DB0; an RP04, RP05, or RP06?

This information determines the size of the disk and is only important for the device on which you will be bootstrapping the system image, and for RK05F disks.

If you will be bootstrapping the unsaved system from an RK06 or RK07, you must specify the correct drive type during SYSGEN. If you will be bootstrapping the system from any other type of disk, you must specify the correct drive type or the drive type of a larger disk. When the system is bootstrapped and the devices are brought on line, the actual drive type overrides whatever you specified during SYSGEN.

The RK05F disk is treated as two units. It is important to specify the correct drive type for these devices so that SYSGEN will generate the correct number of units.

- If you leave out a device whose driver can be built with a loadable data base, you can add the device to your system after the SYSGEN is complete. See Section 4.8.2 for a description of adding a device after SYSGEN.

## RUNNING SYSGEN

- If you specify the wrong configuration for a device whose driver is built with a loadable data base, you can respecify the configuration and replace the incorrect data base after the SYSGEN is complete. See Section 4.8.2 for a description of adding a device after SYSGEN.

### 3.1.4 Saved Answer Files

Whenever you answer a question during SYSGEN, the text of the question as asked and your response are placed in files on the target disk. These saved answer files can be used to redo a SYSGEN without requiring you to answer all the questions again.

SYSGEN creates three saved answer files:

SYSGENSA1.CMD	Contains the responses to questions in the Choosing Executive Options (CE), Assembling the Executive and Drivers (AE), Building the Executive and Drivers (BE), Building the Privileged Tasks (BP), and Creating the System Image File (CS) sections
SYSGENSA2.CMD	Contains the responses to questions in the Choosing Peripheral Configuration (CP) section
SYSGENSA3.CMD	Contains the responses to questions in the Building the Nonprivileged Tasks (BN) section

In later system generations, you can use these files as input.

When you specify these files as input, SYSGEN uses the information contained in the files as answers to SYSGEN questions, without printing the questions on your terminal. If SYSGEN encounters a question for which there is no saved answer, it prints that question on your terminal and prompts for a response.

Before creating each saved answer file, SYSGEN asks you for a comment describing the system being generated. This comment is included in the saved answer file as documentation and is printed when the saved answer file is used as input. This comment may contain more than one line. SYSGEN will continue prompting for input until you enter a null line (produced by pressing RETURN without entering any characters in response to the prompt).

Each saved answer file contains a list of the SYSGEN questions, each followed by its response. The files also include headings that indicate when each file was created. The responses are in the form of Indirect Command Processor .SET directives:

```
.SET symbol value
```

where:

```
symbol    Is an internal SYSGEN symbol
value     Is your response
```

In the Choosing SYSGEN Options (SU) section, SYSGEN asks whether you want to use saved answer files for input. If you enter Yes, the saved answer file that you specify will supply the answers to the proper section or sections.

## RUNNING SYSGEN

Every time you perform SYSGEN, it creates saved answer files with the three file names just listed. Each time you specify saved answer files as input, SYSGEN uses the saved answer files from the last time SYSGEN was performed (unless you specify different input files).

If you exit SYSGEN by pressing CTRL/Z, the saved answer file is closed at the point where it was interrupted. If you later use that file as input, SYSGEN examines the file and prints a message warning that the file may be incomplete. SYSGEN reads the answers that the file contains, and then begins asking questions from the point at which you left off in the aborted SYSGEN. As you answer further questions, SYSGEN appends your answers to the incomplete file.

If SYSGEN exits abnormally, the saved answer files it was creating may be incomplete or locked. You may have to unlock or delete these incomplete files; therefore, it is important that you keep track of the various versions of saved answer files you are creating. One way to do this is to rename the current saved answer files with meaningful names after you exit SYSGEN.

You can use saved answer files to perform a SYSGEN without having to spend much time at a terminal waiting for assembly and task-building to complete; see Section 3.1.5.

### 3.1.5 PREPGEN

PREPGEN is the SYSGEN procedure performed with MCR command lines inhibited. You have the opportunity to answer all the questions, and saved answer files are created, but a new system is not assembled or built, and no files are deleted. Performing a PREPGEN is a way of quickly generating saved answer files that can then be used to perform a "real" SYSGEN unattended.

To perform a PREPGEN, invoke SYSGEN as you normally would and enter Yes to the following question:

```
* SU080   Do you want to do a PREPGEN?
```

If you have never generated an RSX-11M-PLUS system before, or if you are unfamiliar with this version of RSX-11M-PLUS, you may find it useful to run through the questions a number of times to ensure that you make the proper choices for your installation. PREPGEN allows you to change your choices in, for example, the Choosing Peripheral Configuration (CP) section without having to reanswer the questions in the Choosing Executive Options (CE) section. After you are satisfied with your answers, you can then perform a "real" SYSGEN using the saved answer files from the PREPGEN.

### 3.1.6 Autoconfigure

Of all the sections of SYSGEN, the longest and most complicated is the Choosing Peripheral Configuration (CP) section. It is not always convenient to obtain the correct CSR and vector addresses for your specific peripheral devices.

If you are performing a stand-alone system generation and the host computer is the computer for which you are generating an RSX-11M-PLUS system, you can avoid confusion by directing SYSGEN to run Autoconfigure on your hardware.

## RUNNING SYSGEN

To run Autoconfigure, enter Yes when SYSGEN asks the following question:

\* SU100 Do you want to run Autoconfigure on the host system hardware?

**3.1.6.1 What Autoconfigure Does** - When you answer Yes to the Autoconfigure question, SYSGEN automatically determines the correct hardware configuration of your host system: the processor type, the CSR and vector addresses of your peripheral devices, and any optional hardware that may be present (such as floating point or extended instruction set hardware). SYSGEN displays complete configuration information at your terminal after Autoconfigure has finished.

You may use the Autoconfigure results for responses to questions in the Choosing Peripheral Configuration (CP) section of SYSGEN. In this case, SYSGEN automatically answers (and, therefore, bypasses) any questions for which Autoconfigure results can be used as responses. You can also override the results of Autoconfigure (see Section 3.1.6.2).

Autoconfigure is a valid option only if you are generating RSX-11M-PLUS on the baseline system (that is, performing a stand-alone system generation). Autoconfigure can accurately determine the hardware configuration only when there is no pending I/O. Autoconfigure uses a complex series of device interrupts, which requires that there be no other activity on the system.

If you use an input saved answer file containing a saved peripheral configuration and also run Autoconfigure on the host system, SYSGEN merges the device information from both the saved answer file and the autoconfiguration into a single list. Where there are discrepancies in the saved answer file and the Autoconfigure list, the saved answer file always overrides the Autoconfigure results.

If SYSGEN fails to produce an Autoconfigure report like that in Example 3-1 within one minute, then Autoconfigure has failed to determine the configuration of your hardware. If this occurs, you must rebootstrap the baseline system, invoke SYSGEN again, and not choose the Autoconfigure option. When SYSGEN fails to report Autoconfigure results, a severe hardware malfunction might have occurred, or your devices might not be at addresses corresponding to the standard DIGITAL configuration algorithm (detailed in Appendix E).

### Example 3-1 Sample Autoconfigure Output

Processor Type: 11/70

Memory Size: 512. Kw

#### Options:

Floating Point Processor (FP11)  
Extended Instruction Set (EIS)  
Extended (22-bit) Addressing  
Switch Register (SWR)  
Display Register  
Cache Memory  
Parity Memory

(Continued on next page)

RUNNING SYSGEN

Example 3-1 (Cont.)  
Sample Autoconfigure Output

Name	Vector	CSR	Unit	Type	Remarks
DKA	220	177404	0	RK05	
			2	RK05	
DMA	210	177440	0	RK06	
			1	RK06	
			2	RK07	
RHA	224	172440	0_0	TU77	TM03
			0_1	TU77	TM03
RHB	150	176300	0	RM03	
RHC	204	176400	0	ML11A	
RHD	254	176700	0	RP06	
			1	RP06	
			2	RP05	
			3	RP05	Dual access
DXA	264	177170			
DTA	214	177342			
LPA	200	177514			
LPB	270	164004			
YLA	060	177560			
YLB	???	175610			Failed to interrupt
YMA	310	170500			
YMB	314	170510			
YMC	324	170520			
YHA	340	160020			
YHB	350	160040			
YHC	360	160060			
YHD	???	160100			Failed to interrupt

Autoconfigure does not find all the devices about which SYSGEN asks questions. Section 3.1.6.3 describes those devices that Autoconfigure finds. Note that, for many devices, Autoconfigure finds only the first controller.

If you use Autoconfigure, SYSGEN does not ask about any of the devices that Autoconfigure finds, but uses the Autoconfigure results instead. SYSGEN always asks about those devices that are not found by Autoconfigure.

Table 3-1 lists all the remarks that Autoconfigure may include with the configuration information.

RUNNING SYSGEN

Table 3-1  
Autoconfigure Remarks and Meanings

Remark	Meaning
Failed to interrupt	The specified device is either malfunctioning or the hardware configuration is nonstandard, causing Autoconfigure to report unreliable information. Autoconfigure places three question marks (???) in the vector field of the report. SYSGEN does not include the specified device in the resulting system.
Mixed MASSBUS devices	Autoconfigure has detected a MASSBUS controller configured with several classes of peripherals attached to it (for example, an RM03 and an RP06).
TM02 TM03	Indicates the type of magnetic tape formatter associated with this tape drive. Magnetic tape unit numbers are displayed in the following format:  0_1  where:  0 is the formatter unit number 1 is the tape drive unit number
Priority n	Autoconfigure has detected a device with an interrupt priority higher than expected. The actual interrupt priority is n.
Dual access	The specified unit has the dual access option installed. Dual access allows a unit to be shared by two controllers.
??? (in the vector field)	See "Failed to interrupt" remark.
Sector interleaved	The RS03 or RS04 displayed supports sector interleaving, which allows the unit to optimize data accesses.

3.1.6.2 **Overriding Autoconfigure Results** - When you direct SYSGEN to run Autoconfigure, SYSGEN asks the following question, allowing you to override the results of Autoconfigure:

\* SU110 Do you want to override the Autoconfigure results?

## RUNNING SYSGEN

This option directs SYSGEN to display the Autoconfigure results in the default field of each question. Instead of directing SYSGEN to use Autoconfigure results as responses to the questions in the Choosing Peripheral Configuration section, each SYSGEN question appears with the Autoconfigure results as the default instead of the standard default response. You may then examine the Autoconfigure results and either enter a different response or press the RETURN key to use the Autoconfigure result.

You can override Autoconfigure results to enter information not normally determined by Autoconfigure. For example, if your system has four RK06 drives, but one is down with serious hardware problems, Autoconfigure would only report finding three of them. If you know that the drive will be repaired soon, you can override the Autoconfigure results by entering 4 as the number of units for the RK06, instead of the default of 3 provided by Autoconfigure.

Table 3-2 lists the devices supported by the Autoconfigure option. Devices that are not listed in Table 3-2, as well as any malfunctioning devices, cannot be automatically configured.

**3.1.6.3 Hardware Supported by Autoconfigure** - Autoconfigure supports most standard devices supplied by DIGITAL. For those DIGITAL devices in your hardware configuration not supported by Autoconfigure, SYSGEN asks the appropriate question in the Choosing Peripheral Configuration (CP) section to get the specific controller information for those devices.

Autoconfigure does not determine the number of units for DK, DP, DT, or MT devices. It does determine the CSR and vector addresses for those devices. SYSGEN asks questions in the Choosing Peripheral Configuration (CP) section that require you to input the number of units for those devices.

All devices that are to be configured into your system by Autoconfigure must be connected to the system bus and must be powered up. In addition, DK-type and DU-type devices must have a disk spinning in the drive for Autoconfigure to work properly.

Table 3-2 is a list of the hardware supported by Autoconfigure. Refer to Appendix E for more information on the hardware supported by Autoconfigure and the algorithm used to assign addresses to devices attached to the UNIBUS.

### NOTE

Your host system configuration must conform to the standard PDP-11 configuration algorithm (described in Appendix E) for Autoconfigure to report reliable information.

RUNNING SYSGEN

Table 3-2  
Hardware Supported by Autoconfigure

Processors	
PDP-11/23-PLUS (also called MicroPDP-11/23)	
PDP-11/24	
PDP-11/44	
PDP-11/70	
PDP-11/73 (also called MicroPDP-11/73)	
PDP-11/83 (also called MicroPDP-11/83)	
PDP-11/84	
Processor/Memory Options	
FP-11	FPP - Floating Point Processor
KE-11E	EIS - Extended Instruction Set
	CIS - Commercial Instruction Set
KW-11P	Programmable Clock
	Cache Memory
	Switch Register
	Display Register
	Parity Memory
I/O Peripherals and Controllers	
CT	TAll cassette 1
DB	RP04/05/06 disk drive
DD	TU58 DECTape II
DK	RK11/RK05 1
DL	RL211/RL01/RL02 disk 2
DM	RK611/RK711 RK06/RK07 disk 1
DP	RP11/RP02/RP03 disk 1
DR	RM02/RM03/RM05/RM80/RP07 disk drive
DS	RS03/RS04 fixed-head disk
DT	TC11/TU56 DECTape 1
DU	KDA50/UDA50/RC25/RA60/RA80/RA81 disk drive 2
	RQDX1/RQDX2/RQDX3/RD51
	/RD52/RD53 disk drive 2
	RX50/RUX50 diskette drive 2
DX	RX11/RX01 diskette 1
DY	RX211/RXV21/RX02 diskette 1
EM	ML11 semiconductor disk emulator
LP	LP/LS/LV11 line printer
MM	TU16/45/77/TE16 magnetic tape drive
MS	TK25/TS11/TU80/TSV05 magnetic tape drive
MT	TM11/TU10/TE10/TS03 1
MU	TK50 magnetic tape drive 2
PR	PR11/PC11 paper tape reader 1
PP	PC11 paper tape punch 1
RH	RH11/RH70 MASSBUS controller
YH	DH11 asynchronous terminal interface
YL	DL11/DLV11-A/B asynchronous interface
YL	DL11/DLV11-C/D/E asynchronous interface

1. Autoconfigure detects only the first controller for these devices.
2. For pregenerated RSX-11M-PLUS systems only, Autoconfigure detects all controllers for these devices. For non-pregenerated systems, Autoconfigure detects only the first controller for these devices.

(Continued on next page)

**RUNNING SYSGEN**

Table 3-2 (Cont.)  
Hardware Supported by Autoconfigure

I/O Peripherals and Controllers	
YL	DL11/DLV11-J asynchronous interface
YL	DL11-W console interface with line clock
YM	DM11-BB modem controller for DH11
YV	DHV11/DHUV11 asynchronous terminal interface
YZ	DZ11/DZQ11/DZV11 asynchronous terminal interface

3.1.6.4 **The Baseline System** - The baseline system is a stand-alone RSX-11M-PLUS system included with the distribution kit. It contains all the software components and Executive features you need to generate an RSX-11M-PLUS system.

If you copied your distribution kit stand alone in Chapter 2, the baseline system should be currently running on the host computer, and you can use it to invoke and perform the SYSGEN procedure. If the baseline system is not currently running, you must hardware bootstrap the distribution kit disk before you invoke SYSGEN. This brings the baseline system into memory and starts it running.

If you copied your distribution kit on line and intend to invoke SYSGEN on line, you do not need the baseline system.

Tables 3-3 and 3-4 show the peripheral devices generated into the baseline system.

Table 3-3  
RSX-11M-PLUS Baseline Device Configuration

Device Mnemonic	No. of Units	CSR	Vector
DB	8	176700	254
DR	8	176700	254
MM	2	172440	224
DK	2	177404	220
DM	2	177440	210
DL	2	174400	160
DU	4	172150	154
MU	1	174500	260
MS	1	172522	400
DX	2	177170	264
DY	2	160000	410
DD	2	160000	420
LP	1	177514	200
MT	2	160000	430

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**Table 3-4**  
Terminal Configuration

Controller Mnemonic	Controller Type	Terminal Lines	CSR	Vector
YLA (console)	DL11/DLV11	1	177560	60
YLB	DL11/DLV11	1	160000	440
YHA	DH11	8	160000	450
YVA	DHU11/DHV11	8	160000	460
YZA	DZ11/DZQ11 /DZV11	4	160000	470

### 3.1.7 Applying Update

Update is an indirect command file used to apply a cumulative set of corrections to RSX-11M-PLUS and the layered products. The latest Update is supplied with every RSX-11M-PLUS distribution kit. Updates are issued periodically to customers who have purchased Update service.

You must always apply Update to a **copy** of the unaltered distribution kit because each Update is cumulative (that is, Update B contains all the corrections previously distributed in Update A along with the latest corrections).

Instructions for applying Update are described in Section 2.5. Read and follow the instructions for applying Update completely before proceeding to invoke SYSGEN.

### 3.1.8 Invoking SYSGEN

Before you invoke SYSGEN, you should have made a copy of your distribution kit according to the instructions in Chapter 2. After you have made a copy of your distribution kit, invoke the SYSGEN procedure by following these two steps:

1. If it is not mounted already, mount your target `system disk and assign logical device SY: to it. For example, if your target system disk is spinning in DB0:, use the following command sequence:

```
>MOU DB0:RSX11MPBL24 (RET)
>ASN DB0:=SY: (RET)
```

2. Set your default directory to [200,200] and invoke the SYSGEN command file. For example:

```
>SET /UIC=[200,200] (RET)
>@SYSGEN (RET)
```

This procedure invokes the first SYSGEN indirect command file and starts the SYSGEN procedures.

**3.1.8.1 Invoking SYSGEN on a VAX Host Running VAX-11 RSX** - Before you invoke SYSGEN, you should have made a copy of your distribution kit and applied Update following the instructions in Sections 2.4.3 and 2.5.4.

## RUNNING SYSGEN

When you are ready to invoke SYSGEN, use the following procedure:

1. If it is not mounted already, mount your target system disk. For example, if your target system disk is DR0:, use the following command sequence:

```
>MOU DR0:RSX11MPBL24 (RET)
```

2. Set your default device to the target system disk. For example, if your target system disk is DR0:, use the following command sequence:

```
>SET DEF DR0: (RET)
```

3. Set your default UIC and directory to [200,200] and invoke the SYSGEN command file. For example:

```
>SET /UIC=[200,200] (RET)
>@SYSGEN (RET)
```

This procedure invokes the first SYSGEN indirect command file and starts the SYSGEN questions.

### NOTE

If you pause during SYSGEN to edit any files, you cannot use EDT. You must use EDI instead.

When you have generated a new RSX-11M-PLUS system, see Section 2.5.7 for information on applying the layered product files.

## 3.2 SYSGEN QUESTIONS

The rest of this chapter describes the questions that the SYSGEN procedure asks. SYSGEN uses your responses to assemble and task build a version of RSX-11M-PLUS that meets your specific needs and is tailored to your hardware configuration.

If this is your first time generating an RSX-11M-PLUS system, you should use Autoconfigure to determine (if possible) your peripheral configuration and choose the Full-functionality Executive option. Choosing these options reduces the number of questions you must answer, and although the system that results may not be optimized for your needs, you will have a correct, full-functionality system. The first example in Appendix D is an example of this type of system generation.

When you have gained experience and familiarity with your system, you can perform another SYSGEN to produce a system that is tailored specifically to your requirements.

SYSGEN never asks all the questions described in this chapter, because many involve choices that are mutually exclusive. Therefore, although not every question in a sequence will appear on your terminal, the order in which they are listed in this section parallels the order in which SYSGEN asks them.

The questions are divided into eight sections:

- Choosing SYSGEN Options
- Choosing Executive Options

## RUNNING SYSGEN

- Choosing Peripheral Configuration
- Assembling the Executive and Drivers
- Building the Executive and Drivers
- Building the Privileged Tasks
- Building the Nonprivileged Tasks
- Creating the System Image File

## SYSGEN OPTIONS

### 3.2.1 Choosing SYSGEN Options (SU)

In this section, SYSGEN asks questions about the kind of SYSGEN you wish to perform. You can specify the saved answer files to be used, whether you want to do a PREPGEN, whether you want to use Autoconfigure, and whether you want to do a complete SYSGEN.

Your answers to the questions in this section are not saved in a saved answer file; you must answer them each time you invoke SYSGEN.

The following list is a description of all the possible questions you could be asked in the Choosing SYSGEN Options section.

\* SU010 Do you always want the explanation printed? [Y/N D:N]:

If you are unfamiliar with SYSGEN, the help paragraph for each question can be printed automatically before the question appears on your terminal.

Enter Yes if you have not performed a SYSGEN before or if you are performing a Version 3.0 SYSGEN for the first time.

If you enter No, you may still obtain the help paragraph for any question by pressing the ESC key in response to the question.

\* SU020 Do you want to use a saved answer file as input for the Executive options? [Y/N D:N]:

SYSGEN always creates saved answer files containing your responses to the questions asked during a particular SYSGEN. The following is a list of the files created and the responses they contain:

SYSGENSA1.CMD	Choosing Executive Options, Assembling the Executive and Drivers, Building the Executive and Drivers, Building the Privileged Tasks, Creating the System Image File
SYSGENSA2.CMD	Choosing Peripheral Configuration
SYSGENSA3.CMD	Building the Nonprivileged Tasks

If you have performed a SYSGEN (or PREPGEN) before, you can use the saved answer files created during the previous SYSGEN as input to your current SYSGEN. The SYSGEN procedure uses the saved answers as your responses to the questions in the current SYSGEN.

You should perform a PREPGEN first to create saved answer files and then perform a SYSGEN specifying those saved answer files as input to the various SYSGEN sections.

If you enter Yes, SYSGEN asks you to provide the file name for the saved answer file that contains answers to the questions in the Choosing Executive Options (CE), Assembling the Executive and Drivers (AE), Building the Executive and Drivers (BE), Building the Privileged Tasks (BP), and Creating the System Image File (CS) sections.

## SYSGEN OPTIONS (Cont.)

If you enter No, SYSGEN proceeds to Question SU040.

For more information on saved answer files, see Section 3.1.4.

**\* SU030 Enter saved answer file name [S D:"SYSGENSA1.CMD"]:**

This question appears only if you indicated that you wished to use saved answers to the "Executive group" questions.

Enter the file specification of the saved answer file containing previously generated answers to the questions in the Choosing Executive Options (CE), Assembling the Executive and Drivers (AE), Building the Executive and Drivers (BE), Building the Privileged Tasks (BP), and Creating the System Image File (CS) sections.

**\* SU040 Do you want to use a saved answer file as input for  
\* the peripheral configuration? [Y/N D:N]:**

If you enter Yes, SYSGEN asks you to provide the file name for the saved answer file that contains answers to questions in the Choosing Peripheral Configuration (CP) section.

If you enter No, SYSGEN proceeds to Question SU060.

**\* SU050 Enter saved answer file name [S D:"SYSGENSA2.CMD"]:**

This question appears only if you indicated that you wished to use saved answers to the Choosing Peripheral Configuration (CP) section.

Enter the file specification of the saved answer file containing previously generated answers to the questions in the Choosing Peripheral Configuration (CP) section.

**\* SU060 Do you want to use a saved answer file as input for  
\* the nonprivileged task builds? [Y/N D:N]:**

If you enter Yes, SYSGEN asks you to provide the file name for the saved answer file that contains answers to questions in the Building the Nonprivileged Tasks (BN) section.

If you enter No, SYSGEN proceeds to Question SU080.

**\* SU070 Enter saved answer file name [S D:"SYSGENSA3.CMD"]:**

This question appears only if you indicated that you wished to use saved answers to the nonprivileged task-build questions.

Enter the file specification of the saved answer file containing previously generated answers to the questions in the Building the Nonprivileged Tasks (BN) section.

## SYSGEN OPTIONS (Cont.)

\* SU080 Do you want to do a PREPGEN? [Y/N D:N]:

PREPGEN allows you to answer all the SYSGEN questions and create saved answer files without performing SYSGEN: no MCR commands are executed, no files are deleted, and the Executive is not assembled or built. After successfully completing the PREPGEN, you can invoke SYSGEN and use the saved answer files generated during PREPGEN. SYSGEN then proceeds unattended. For more information on PREPGEN, see Section 3.1.5.

\* SU090 Enter the name of the disk drive containing your  
\* target system disk [ddnn:] [S R:2-5]:

Enter the unit designation (for example, DB2:) of the drive containing the copy of the distribution kit prepared according to the instructions in Chapter 2. This disk volume will be referred to in this and subsequent chapters as the target system disk.

\* SU100 Do you want to run Autoconfigure on the host system  
\* hardware? [Y/N D:N]:

This question appears only if you are running on the baseline system (that is, if you are performing a stand-alone SYSGEN).

Enter Yes if you wish to use the Autoconfigure task to determine the hardware configuration of the host system. For a description of the Autoconfigure task, see Section 3.1.6.

If the host processor is not the processor for which you are generating this system, enter No.

After determining your hardware configuration, Autoconfigure prints a table of what it found. If no results are printed within a few minutes, Autoconfigure has failed and you should rebootstrap your system and restart the SYSGEN. Do not use Autoconfigure the next time.

If you have already performed a PREPGEN or SYSGEN during which you ran Autoconfigure, and you are using the saved answer files from that PREPGEN or SYSGEN, you do not need to run Autoconfigure again. The saved answer files contain all the device information from Autoconfigure.

\* SU110 Do you want to override the Autoconfigure results? [Y/N D:N]:

If you enter Yes, the configuration data obtained by Autoconfigure appears in the default fields of each question. You can then choose to use some of the Autoconfigure results (by pressing the RETURN key and taking the default), or you can override the Autoconfigure results by entering a different response.

If you enter No, SYSGEN uses all the information Autoconfigure obtained to answer the questions in the Choosing Peripheral Configuration (CP) section. Questions about devices that Autoconfigure supports but did not find in your configuration are not asked. Questions about devices that Autoconfigure does not support are asked as usual.

## SYSGEN OPTIONS (Cont.)

If you are using both the Autoconfigure results and a saved answer file, the saved answer file responses take precedence over the Autoconfigure results.

For additional information on Autoconfigure, see Section 3.1.6.

**\* SU120 Do you want to do a complete SYSGEN? [Y/N D:Y]:**

Every time you start SYSGEN, you have the following options:

- You can do a complete SYSGEN.
- You can continue a previous SYSGEN.
- You can do an individual section of SYSGEN.

A complete SYSGEN performs all the following sections of SYSGEN:

- Choosing SYSGEN Options
- Choosing Executive Options
- Choosing Peripheral Configuration
- Assembling the Executive and Drivers
- Building the Executive and Drivers
- Building the Privileged Tasks
- Building the Nonprivileged Tasks
- Creating the System Image File

If you are generating a new RSX-11M-PLUS system, you should enter Yes. If you have just applied the latest Update and are now performing the required SYSGEN, you should also enter Yes to this question.

If you enter Yes, each section leads directly into the next section, and SYSGEN proceeds to Question CE010.

If you enter No, SYSGEN proceeds to Question SU130.

**\* SU130 Do you want to continue a previous SYSGEN from some point? [Y/N D:Y]:**

If you have an incomplete SYSGEN that you wish to continue or if you wish to redo part of a previous SYSGEN, you may start SYSGEN at any of the sections just listed. SYSGEN proceeds from that section to the end.

### NOTE

Before you continue SYSGEN at a particular section, all previous sections must have been successfully completed.

## SYSGEN OPTIONS (Cont.)

If you enter Yes, SYSGEN proceeds to Question SU140.

If you enter No, SYSGEN proceeds to Question SU150.

**\* SU140 At which section would you like to restart SYSGEN? [S R:0-1]:**

This question appears only if you entered Yes to Question SU130.

Enter the letter of the section at which you wish to restart SYSGEN:

- A. Choosing Executive Options
- B. Choosing Peripheral Configuration
- C. Assembling the Executive and Drivers
- D. Building the Executive and Drivers
- E. Building the Privileged Tasks
- F. Building the Nonprivileged Tasks
- G. Creating the System Image File

**\* SU150 Do you want to do any individual sections of SYSGEN? [Y/N D:Y]:**

Instead of performing a complete SYSGEN or continuing a previous SYSGEN, you may specify individual sections of SYSGEN that you want to perform. You would perform only selected sections of the SYSGEN procedure if you wanted to add a new device to a previously generated system, or if you wanted to create a new system image file. See Chapter 4 for further information on making changes to a system you have generated already.

Note that the SYSGEN sections must be done in order because each depends upon the output of the previous sections. Do not perform the sections out of order.

If you enter Yes, SYSGEN proceeds to Question SU160.

If you enter No, SYSGEN exits.

**\* SU160 Which sections would you like to do? [S R:0.-15.]:**

This question appears only if you entered Yes to Question SU150.

Enter the letters (separated by commas) of the sections of SYSGEN you wish to perform:

- A. Choosing Executive Options
- B. Choosing Peripheral Configuration
- C. Assembling the Executive and Drivers
- D. Building the Executive and Drivers
- E. Building the Privileged Tasks
- F. Building the Nonprivileged Tasks
- G. Creating the System Image File
- H. Adding a Device

## EXECUTIVE OPTIONS

### 3.2.2 Choosing Executive Options (CE)

The questions in this section pertain to the RSX-11M-PLUS Executive. You can assemble one of the following Executives:

- Full-functionality
- User-tailored

The Full-functionality Executive is the recommended choice because it includes all RSX-11M-PLUS Executive options. Selecting this Executive saves time (options are included automatically and questions do not appear) and ensures that important options are not inadvertently excluded.

The User-tailored Executive requires that you explicitly select the options for which you want support. Among these options are several that are required for optimum system performance. Select the User-tailored Executive only when specific applications require exclusion of an option.

Your answers to questions in this section are put in the saved answer file [200,200]SYSGENSA1.CMD.

The following is a description of all the possible questions in the Choosing Executive Options (CE) section.

**\* CE010 What is your target processor type? [S R:5.-12. D:"11/70"]:**

Enter the processor type of the target system, choosing from the following list:

```
LSI-11/73
PDP-11/23-PLUS (also called MicroPDP-11/23 and 11/23-B)
PDP-11/24
PDP-11/44
PDP-11/70
PDP-11/73 (also called MicroPDP-11/73)
PDP-11/83 (also called MicroPDP-11/83)
PDP-11/84
```

The processor type determines whether Executive data space and supervisor-mode library support can be included in the system. You can run an RSX-11M-PLUS system with Executive data space or supervisor-mode library support only on a PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, or PDP-11/84 processor. You can run a system without this support on any of the specified processors.

**\* CE020 Do you want the Full-functionality Executive? [Y/N D:Y]:**

Enter Yes to select an Executive that includes all the following RSX-11M-PLUS operating system options:

- Support for Executive data space and user data space (option is included in the Full-functionality Executive only if your processor contains hardware for instruction and data space, such as the PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, and PDP-11/84)

## EXECUTIVE OPTIONS (Cont.)

- Support for supervisor-mode libraries (tasks linked to FCSFSL; PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, and PDP-11/84)
- Tasks linked to FCSRES (MicroPDP-11/23, PDP-11/23-PLUS, and PDP-11/24 only)
- Fast map facility
- Task headers out-of-pool support
- Extended logical name support
- All DIGITAL-supplied drivers loadable
- Interrupt Control Block (ICB) pool size of 128 words
- Decimal version numbers in file specifications
- Shadow recording support
- Disk data caching
- Console driver support
- Resource Accounting support
- Batch processor support
- Queue Manager for spooling
- DIGITAL Command Language (DCL) and alternate CLI support
- CTRL/C abort support
- High-performance FCP
- File windows in secondary pool
- Virtual terminal support (maximum virtual terminal unit buffer size is 184(decimal) bytes; default virtual terminal unit buffer size is 120(decimal) bytes)
- Character translation support
- Terminal driver extended I/O support
- Time-out on unsolicited terminal input after 30(decimal) seconds

Enter No to select the User-tailored Executive. This option requires you to specify which Executive options you wish to include in your system. Choosing this Executive is not recommended. Select this Executive only if your application demands that specific RSX-11M-PLUS options be excluded from the system.

If you enter Yes, SYSGEN proceeds to Question 00CE120.

If you enter No, SYSGEN proceeds to Question CE030.

## EXECUTIVE OPTIONS (Cont.)

\* CE030 Do you want to reconsider your selection? [Y/N D:N]:

Enter Yes if, having read the previous descriptions and recommendations, you want to select the Full-functionality Executive.

\* CE050 Do you want Executive data space support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive and if your target processor is a PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, or PDP-11/84.

Enter Yes to generate an Executive with separate instruction and data space. (The hardware for instruction and data space separates code from data and maps the two separately).

Enter No if you do not want to include Executive data space support. The MicroPDP-11/23, PDP-11/23-PLUS and PDP-11/24 processors do not contain hardware for instruction and data space; systems generated with software support for Executive data space will not run on these processors. Also, you should enter No if you need to generate a system that will run on both types of processors: those that cannot support instruction and data space (MicroPDP-11/23, PDP-11/23-PLUS, or PDP-11/24) and those that can support instruction and data space (PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, or PDP-11/84).

This option significantly increases the available amount of system pool.

If you answer Yes, SYSGEN automatically includes support for supervisor-mode libraries. In addition, SYSGEN makes all DIGITAL-supplied drivers and their data bases loadable.

### NOTE

In a system including Executive data space support, all drivers must be loadable. Therefore, if you wish to include a resident, user-written driver, you must exclude this option by entering No.

\* CE060 Do you want user data space support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive, your target processor is a PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, or PDP-11/84, and you selected Executive data space support.

User data space support allows tasks to use the user mode instruction and data space mapping hardware to map code and data separately.

\* CE070 Do you want support for task headers out-of-pool? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive.

Enter Yes to allow task headers to reside in physical memory outside of the dynamic storage region (pool), which increases the amount of pool available for other system functions.

## EXECUTIVE OPTIONS (Cont.)

Out-of-pool task headers are required for RTEM-11, the RT-11 emulator that runs under RSX-11M-PLUS. Note that RTEM-11 must be purchased and installed separately. Enter Yes if you intend to install RTEM-11 on your system.

\* CE075 Do you want extended logical name support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive.

Enter Yes to include the directives to create, delete, and translate logical names into their equivalence strings. Extended logical name support also includes the directives used for parsing and merging files specifications into an expanded format or into data blocks compatible with FCS or RMS.

Entering No results in an Executive that includes only the traditional RSX limited logical name support (the ability to assign logical names of the form ddnn: to devices).

Choosing extended logical name support decreases the amount of available system pool, and will affect system performance if a large number of logical names are defined.

\* CE080 Do you want supervisor-mode library support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive and excluded Executive data space support, and if your target processor is a PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, or PDP-11/84.

Enter Yes to generate an Executive that can map large, pure libraries in supervisor space rather than in the user's address space. The RSX-11M/M-PLUS and Micro/RSX Task Builder Manual supplies details on using supervisor-mode libraries.

If you enter Yes, SYSGEN builds many of the privileged tasks to link to FCSFSL, the FCS supervisor-mode library. You will also be able to use the prebuilt nonprivileged tasks of the form xxxFSL.TSK that are supplied on the distribution kit. See Section 3.2.7.

\* CE090 Do you want to use FCSRES, the FCS resident library? [Y/N D:N]:

This question appears only if you did not include support for supervisor-mode libraries, or if you chose the User-tailored Executive and your processor is a PDP-11/23-PLUS, PDP-11/24, or MicroPDP-11/23.

FCSRES is a resident library of commonly used FCS routines. Tasks can be built to map to the FCS routines in this library instead of including the FCS routines in their task images. This saves physical memory, because the many separate copies of FCS routines that would occur in task images are replaced by a single, shared copy used by all tasks.

## EXECUTIVE OPTIONS (Cont.)

If you enter Yes, SYSGEN will build many of the privileged tasks to link to FCSRES. You will also be able to use the prebuilt nonprivileged tasks of the form xxxRES.TSK supplied on the distribution kit. For more information, see Section 3.2.7.

### NOTE

Tasks built to link to a library on RSX-11M-PLUS are not transportable to an RSX-11M system.

**\* CE094 Do you want support for the fast map facility? [Y/N D:N]:**

This question appears only if you selected the User-tailored Executive.

Enter Yes to include an alternate interface to the memory management hardware, which is much faster than the memory management directives. You can use the fast map facility to improve the performance of memory-resident overlaid tasks and FORTRAN tasks that use virtual arrays. The memory management directives are still included if you enter Yes.

**\* CE100 Do you want all DIGITAL-supplied drivers and their data bases to be loadable? [Y/N D:N]:**

This question appears only if you selected the User-tailored Executive and if you excluded Executive data space support. It applies only to DIGITAL-supplied drivers (those provided with the RSX-11M-PLUS distribution kit). If you intend to include user-supplied drivers, you will be asked to specify whether each user-supplied driver and data base is loadable or resident in the Choosing Peripheral Configuration (CP) section.

If you enter Yes, all DIGITAL-supplied drivers and their data bases are built as loadable.

If you enter No, you will be asked to specify whether each driver and data base is loadable or resident in the Choosing Peripheral Configuration (CP) section of SYSGEN.

**\* CE110 What is the ICB pool size (in words)? [D R:16.-1024. D:128.]:**

This question appears only if you did not include Executive data space support.

For loadable drivers, the hardware cannot dispatch directly to an interrupt service routine in the driver. The driver is outside the Executive address space and therefore must be mapped before you use it. The code required initially to service an interrupt and dispatch to the proper driver resides in an Executive structure called the Interrupt Control Block (ICB). Thus, the interrupt vector for a controller serviced by a loadable driver points to an ICB rather than to the driver. See the RSX-11M-PLUS Guide to Writing an I/O Driver for details.

## EXECUTIVE OPTIONS (Cont.)

On a system without Executive data space, ICBs are allocated from the system pool. On a system with Executive data space, ICBs are allocated from a separate ICB pool. Your response to this question determines the minimum size of the ICB pool in the unsaved system image. When the unsaved system is saved, more space is automatically allocated to the ICB pool.

For every 16(decimal) controllers of a given type, there must be one ICB, 8(decimal) words long, that will be loaded in the unsaved system image.

The default response allocates 128(decimal) words for ICB pool space. This amount is adequate for most systems and is the recommended response.

If you do not enter the default response, the acceptable range is 16 through 1024(decimal).

\* CE120 Do you want support for communications products  
 \* (such as DECnet, PSI, and LAT)? [Y/N D:N]:

Enter Yes if you intend to use DECnet, PSI, LAT, or other communications products. Refer to the specific product documentation for more information. Note that DECnet and other communications products must be purchased and installed separately.

If you enter Yes, DCL and alternate CLI support and Network Command Terminal (NCT) support will also be included.

\* CE122 Do you want host support for LAT terminal servers? [Y/N D:N]:

This question appears only if you selected communications product support by answering Yes to Question CE120.

Local area transport (LAT) terminal servers allow terminals to be connected to one or more nodes on an Ethernet network.

Enter Yes to allow your system to be accessed by a LAT terminal server. Choosing this support increases the size of the terminal driver by approximately 1 KW.

\* CE130 What is the system name? [S R:0-6 D:"RSXMPL"]:

The system name is an arbitrary character string. It should be the same as the DECnet node name, if any. Enter an alphanumeric string of six or fewer characters to be used to identify your system.

\* CE140 Do you want shadow recording support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive.

Shadow recording creates mirror images of disk volumes. For more information on shadow recording, see the RSX-11M/M-PLUS System Management Guide.

## EXECUTIVE OPTIONS (Cont.)

**\* CE145 Do you want disk data caching support? [Y/N D:N]:**

This question appears only if you selected the User-tailored Executive.

Enter Yes to include support for disk data caching. Keep in mind that although disk data caching can improve disk I/O and overall system performance, it takes up space in memory and increases processor overhead. See the RSX-11M/M-PLUS System Management Guide for more information.

**\* CE150 Do you want console driver support? [Y/N D:N]:**

This question appears only if you selected the User-tailored Executive.

Enter Yes to include support for the console driver. Console driver support provides a means of intercepting and logging console terminal messages. See the RSX-11M/M-PLUS System Management Guide for more information on the Console Output Task (COT) and the console driver.

**\* CE160 Do you want accounting support? [Y/N D:N]:**

This question appears only if you selected the User-tailored Executive.

Enter Yes to include support for Resource Accounting. See the RSX-11M/M-PLUS System Management Guide for more information on Resource Accounting.

**\* CE170 Do you want to include the batch processor? [Y/N D:N]:**

This question appears only if you selected the User-tailored Executive.

The batch processor (BPR) provides background processing of job streams.

If you enter Yes, the Queue Manager and virtual terminal support are also included.

For more information on the batch processor, see the RSX-11M/M-PLUS Batch and Queue Operations Manual.

**\* CE180 Do you want to include the Queue Manager? [Y/N D:N]:**

This question appears only if you selected the User-tailored Executive and you have not included the batch processor. If you included the batch processor, the Queue Manager is automatically included and this question does not appear.

The Queue Manager (QMG) provides for input and output spooling. For more information on the Queue Manager, see the RSX-11M/M-PLUS Batch and Queue Operations Manual.

## EXECUTIVE OPTIONS (Cont.)

\* CE190 Do you want to include DCL and alternate CLI support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive and you did not include support for communications products. If you included support for communications products by entering Yes to Question CE120, DCL and alternate CLI support are automatically included and this question does not appear.

The DIGITAL Command Language (DCL) is compatible among several DIGITAL operating systems. Alternate CLI support allows you to include your own command line interpreters in your system. For information on DCL syntax, see the RSX-11M-PLUS Command Language Manual. The RSX-11M/M-PLUS System Management Guide contains a chapter on the DCL task and other information needed by users who wish to write their own CLI.

\* CE194 Do you want CTRL/C abort support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive.

CTRL/C abort support is a DCL feature that allows you to abort the task running at your terminal by pressing CTRL/C. You can turn this behavior on or off using the DCL command SET TERMINAL/CONTROL=C. For more information on CTRL/C abort, see the RSX-11M-PLUS Command Language Manual.

This feature is not available through MCR.

\* CE200 Which FCP do you want? [S R:1-6 D:"FCPLRG"]:

This question appears only if you selected the User-tailored Executive.

Two versions of the Files-11 ACP (F11ACP) are available on RSX-11M-PLUS:

- FCPMDL

This is a 5K-word, overlaid FCP, which provides good performance for systems with limited memory. It provides buffering for caching of directories and the bitmap, as well as buffer space for about 20 open files. Also included are preaccessed directories, providing for minimum use of system pool.

- FCPLRG

This is a 9K-word, nonoverlaid FCP, which provides maximum performance for F11ACP. Because it does not use overlays, it incurs no system overhead for executing any code sequence. FCPLRG has the maximum number of buffers for all operations, as well as a large directory buffer.

Both versions of F11ACP have the same software features. The default is FCPLRG.

## EXECUTIVE OPTIONS (Cont.)

\* CE210 Do you want support for file windows in secondary pool? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive.

Enter Yes to allow the FCP to put file windows in secondary pool instead of primary pool, thus freeing valuable primary pool space and reducing the likelihood of pool space problems.

\* CE214 Do you want decimal version numbers in  
\* file specifications? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive.

This option determines whether version numbers in file specifications are treated as octal or decimal. If you answer NO, version numbers will be in octal. If you answer YES, version numbers will be in decimal.

File version numbers are stored on disk or tape in binary. This option does not affect how the files are stored. No matter how you answer this question, you will still be able to access all versions of your files. This option affects only how you refer to the files and how the file specifications are displayed: either with octal or decimal version numbers.

\* CE220 Do you want virtual terminal support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive and you did not include batch processor support. If you included batch processor support, virtual terminal support is automatically included and this question does not appear.

Virtual terminal support permits a parent task to simulate terminal I/O for an offspring task. See the RSX-11M/M-PLUS and Micro/RSX Executive Reference Manual for more information on virtual terminal support and the associated Executive directives.

\* CE230 What is the default virtual terminal unit buffer  
\* size? [D R:1.-512. D:120.]:

This question appears only if you selected the User-tailored Executive and you included batch processor support or virtual terminal support.

The Create Virtual Terminal (CRVT\$) directive creates the data structure for a virtual terminal and links it to the device list. Directive parameters include AST addresses and maximum buffer size allowed for offspring I/O requests. If you omit the maximum buffer length in the directive, it defaults to the value you specify in response to this question.

The acceptable range is 1 through 512(decimal). The default is 120(decimal). See the RSX-11M/M-PLUS and Micro/RSX Executive Reference Manual for more information.

## EXECUTIVE OPTIONS (Cont.)

- \* CE240 What is the maximum virtual terminal unit buffer size? [D R:1.-512. D:184.]:

This question appears only if you selected the User-tailored Executive and you included batch processor or virtual terminal support.

Enter the maximum buffer size that can be specified in a Create Virtual Terminal (CRVT\$) directive.

The acceptable range is 1 through 512(decimal). The default response is 184(decimal). See the RSX-11M/M-PLUS and Micro/RSX Executive Reference Manual for more information.

- \* CE250 Do you want character translation support? [Y/N D:N]:

This question appears only if you selected the User-tailored Executive.

Character translation support is a terminal driver option that allows you to select the translation to be performed between the character set used by your application and the character set used by your terminal. This feature allows applications that use the DIGITAL Multinational Character Set to be used with terminals that support different national character sets.

You can use the translation routines supplied with RSX-11M-PLUS or you can use your own. You can load different translation routines for each terminal in your system. If you enter Yes, you also get terminal driver extended I/O support.

- \* CE254 Do you want terminal driver extended I/O support [Y/N D:N]:

This question appears only if you selected the User-tailored Executive and did not include support for communications products (CE120) or character translation (CE250).

Extended I/O support is a terminal driver option that allows additional I/O function and subfunction codes for terminal reads and writes.

- \* CE260 Enter unsolicited input time-out (in seconds) [D R:0.-255. D:30.]:

This question appears only if you selected the User-tailored Executive.

The full-duplex terminal driver discards unsolicited input when the time-out value that you specify expires. (The driver issues a CTRL/U.) The valid time-out range is 0 through 255(decimal).

Enter 0 to inhibit the full-duplex terminal driver unsolicited input time-out feature. The default response is 30(decimal) seconds.

## EXECUTIVE OPTIONS (Cont.)

**\* CE264 Do you want IP11 industrial I/O subsystem support? [Y/N D:N]:**

The IP11 industrial I/O subsystem is a package combining hardware and software used for process control and monitoring in manufacturing and industry. It consists of an RSX device driver (IPDRV) and a set of FORTRAN-callable routines that are used to communicate with a variety of hardware I/O modules. See the IP11 I/O Subsystem Software Installation Guide for more information on installing the software.

Enter Yes if you intend to use the IP11 subsystem hardware and software. If you enter Yes, SYSGEN proceeds to Question CE266.

If you enter No, SYSGEN proceeds to Question CE270.

**\* CE266 Do you want IP11 power fail support? [Y/N D:N]:**

This question appears only if you selected IP11 support by answering Yes to Question CE264.

Enter Yes to include IP11 power fail support in the Executive.

You must include this support in the Executive before you can include power fail support in the IP11 driver (IPDRV). Choosing this support adds approximately 40(octal) bytes to the size of the Executive.

The IP11 subsystem can save the context of digital outputs and digital-to-analog converters if system power fails and will restore the outputs when the power is restored. See the IP11 subsystem documentation for more information.

**\* CE270 Do you want to include XDT? [Y/N D:N]:**

The Executive Debugging Tool (XDT) provides a subset of ODT-11 commands for use in system state. If selected, XDT is included in the Executive. Including XDT allows interactive debugging of Executive modules, privileged tasks, I/O drivers, and interrupt service routines.

If you enter Yes, consistency check code is included in the dynamic memory allocation routines. Note that entering Yes reduces the amount of primary pool if your target processor is a PDP-11/23-PLUS, PDP-11/24, or MicroPDP-11/23 or if you did not include Executive data space support. If you included Executive data space support, XDT does not reduce the available amount of primary pool.

For more information on XDT, see the RSX-11M-PLUS Guide to Writing an I/O Driver and the RSX-11M/M-PLUS and Micro/RSX Debugging Reference Manual.

**\* CE280 Enter the crash notification device CSR  
\* address [O R:160000-177700 D:177564]:**

If the system crashes, the Executive crash module issues a message at the selected device.

## EXECUTIVE OPTIONS (Cont.)

Enter the CSR address (the I/O page address of the transmitter register) for the crash notification device. The normal device is the console terminal, which has a CSR address of 177564(octal). This is the default response. If you do not select the default, the acceptable range is 160000 through 177700(octal).

- \* CE290 On what device and unit do you want crash dumps
- \* to be written? [S R:2-6]:

Enter the device mnemonic and the logical unit number of the device on which you want the Executive crash module to write memory dumps. Mnemonics of supported devices are DB, DD, DK, DL, DM, DT, DR, DU, MM, MS, MT, and MU. Enter both the device mnemonic and the logical unit number (for example, DK2: or MS0:).

The crash device must not be a fixed-medium device. For example, if you specify DU3: as the memory dump device and DU3: is an RA80 disk (a fixed-medium device), your system will not be able to perform a memory dump after crashing. The crash dump module will detect that DU3: is a fixed-medium device and print an error message. SYSGEN cannot check to see whether DU3: is a fixed-medium device; it is your responsibility to ensure that the device you specify is not a fixed-medium device.

If possible, avoid using your system device as the memory dump device. If you must choose the system device as the memory dump device, always remember to replace the system disk with a blank disk before dumping memory to avoid destroying the system disk.

- \* CE310 Enter memory size (in K words) [D R:128.-1920. D:256.]:

Enter the amount of memory for your processor in 1024-word blocks. The legal range is from 128K through 1920K. The default response is 256(decimal).

Your answer to this question need not be precise. VMR uses this value when it creates the system image file, and does not allow you to create a partition or load anything in memory beyond the value you enter here. When the system is bootstrapped, the actual memory size is calculated and overrides this value.

- \* CE320 Do you want floating point processor support? [Y/N D:N]:

The PDP-11 floating-point processor performs all floating-point arithmetic operations and converts data from integer to floating-point format and vice versa.

If you enter Yes, the Executive dynamically determines whether the processor has a floating-point unit when the system is bootstrapped.

If you enter No, the Executive will not support a floating-point processor.

## EXECUTIVE OPTIONS (Cont.)

\* CE330 Is your system clock programmable (KW11-P)? [Y/N D:N]:

RSX-11M-PLUS requires a real-time clock for operation. Three clocks are available: the KW11-P programmable frequency clock, the KW11-L line frequency clock, and the DL11-W line frequency clock/console.

Enter Yes if your system includes the KW11-P and you want to use this clock as your system clock. You must then specify the number of clock interrupts per second.

Enter No if your system does not include the KW11-P, or if your system includes a KW11-P but you do not wish to use this clock as your system clock. You must then specify your local line frequency.

\* CE340 What is the number of interrupts per second? [D R:1.-1000.]:

More than 100(decimal) clock interrupts per second greatly increases system overhead; you should carefully consider the impact on your system before specifying more than 100(decimal) interrupts per second.

### NOTE

The number of interrupts you select must be divisible evenly into 10,000(decimal).

\* CE350 Is your line frequency 50 Hz? [Y/N D:N]:

You can specify a line frequency of either 50 Hz (enter Yes) or 60 Hz (enter No or press RETURN). In the United States, line frequency is always 60 Hz.

## PERIPHERAL CONFIGURATION

### 3.2.3 Choosing Peripheral Configuration (CP)

The questions in this section describe the peripheral devices that can be included in your target configuration. The questions define unique hardware and software information that RSX-11M-PLUS uses to communicate with peripheral devices.

In this section, you enter device-dependent parameters that define addressing information as well as special attributes for the peripheral devices. Note that CON and VMR permit you to change vector and CSR assignments, which lessens the importance of precision in this section. The number and type of devices in the target configuration, however, remain critical.

If you do not know the correct CSR address for a particular device, specify a CSR address of 160000(octal) for that device. CON ignores devices with this value; you can enter the correct address after SYSGEN by using the VMR or MCR CON command.

Appendix B lists the device names, controller names, and corresponding device and controller mnemonics for all RSX-11M-PLUS devices.

In the following questions, a particular controller is defined by and distinguished from other controllers of the same type by the following:

- Its CSR and vector address
- The devices that are connected to it

SYSGEN uses a two-character controller mnemonic followed by a letter to designate a particular controller. For example, "RHA" designates a particular RH controller. The convention is that RHA is the first controller, RHB is the second controller, and so on.

The first controller is the first that you describe to SYSGEN. This is not necessarily the first controller in the hardware configuration. You can designate any controller as controller "A" as long as your use is consistent.

In this section, you will find a number of devices with similar characteristics referred to in a shorthand notation. For example, the term "RM02/03/05/80/RP07 disks" means "the RM02, RM03, RM05, RM80, and RP07 disks."

Your answers to questions in this section are put in the saved answer file [200,200]SYSGENSA2.CMD.

The following is a description of all the possible questions in the Choosing Peripheral Configuration (CP) sections.

\* CP0604 How many RH controllers do you have? [D R:0.-15. D:4.]:

Enter the number of RH controllers in the target configuration.

## PERIPHERAL CONFIGURATION (Cont.)

The RH controller is the controller for the following device types:

```

DB   RP04/05/06 disks
DR   RM02/03/05/80/RP07 disks
DS   RS03/04 disks
EM   ML11 semiconductor disk emulator
MM   TM02/03 and TU16/TE16/TU45/TU77 magnetic tapes
    
```

If you enter 0, the system cannot support DB-, DR-, DS-, EM-, or MM-type devices.

If you enter a number greater than 0, SYSGEN asks device-specific questions for DB-, DR-, DS-, EM-, and MM-type devices. Note that in these questions you must specify the physical connection among the RH controllers and the devices. RSX-11M-PLUS uses the following names to distinguish the RH controllers:

```

RHA (first)
RHB (second)
RHC (third)
RHD (fourth)
    
```

SYSGEN requests the interrupt vector and CSR assignments for each RH controller after you have described the RH devices. This permits SYSGEN to apply a default interrupt vector and CSR address for each controller based on the attached devices. For example, the default interrupt vector for an RH controller servicing an RP04/05/06 disk subsystem is 254. The following is a list of the default interrupt vector and CSR addresses:

Device Type	Vector	CSR
DB	254	176700
DR	254	176700
DS	204	172040
EM	none	176400
MM	224	172440

If you specify a mixed MASSBUS configuration during the device-specific questions (for example, if you enter RHA as the controller for both DB- and MM-type devices), SYSGEN does not apply defaults for the vector and CSR assignments.

\* CP0612 Do you want to generate a mixed MASSBUS configuration? [Y/N D:N]:

A mixed MASSBUS configuration has different device types on the same RH controller (for example, both DB-type and DR-type devices on RHA). If you choose to generate a mixed MASSBUS configuration, all the MASSBUS device data bases will be resident.

Note that the device types differ in a mixed MASSBUS configuration. If you have an RP04 disk and an RP06 disk connected to the same controller, you do not have a mixed MASSBUS configuration, because the RP04 and RP06 are both DB-type devices. See Appendix B for a list of RSX-11M-PLUS device names and types.

## PERIPHERAL CONFIGURATION (Cont.)

- \* CP0808 How many RP04/05/06 disk drives do you have? [D R:0.-63. D:0.]:

Enter the total number of RP04/05/06 disk drives in the target configuration. Each RH controller can support as many as eight RP04/05/06 disk drives.

- \* CP0820 Are any of the units dual-access? [Y/N D:N]:

RP04/05/06 disk drives can be connected to two controllers at one time; either controller can access the disk at the option of the system software. If your target configuration includes more than one RH controller, you must specify whether any of the DB: devices are dual-access units.

- \* CP0836 What is the physical unit number of DBn:? [0 R:0-7 D:n]:

Enter the physical unit number (found on the unit plug) for each RP04/05/06 drive.

- \* CP0840 Is DBn: a dual-access unit? [Y/N D:N]:

This question appears only if you indicated that your target system includes dual-access RP04/05/06 drives. Enter Yes to designate this drive as a dual-access unit.

- \* CP0844 To which RH controller is DBn: connected? [S R:1-1]:

RH controllers are named alphabetically: the first is RHA, the second is RHB, the third is RHC, and the fourth is RHD. Enter the RH controller name for each DB: device. (Normally, all DB: devices are on the same RH.)

If you designated DBn: as a dual-access drive, this question does not appear and Question CP0848 appears instead.

- \* CP0848 To which RH controller is port n of DBn: connected? [S R:1-1]:

Enter the RH controller name for each port of the DB: device.

- \* CP0860 Is DBn: an RP04, RP05, or RP06? [S R:4-4 D:"RP06"]:

Enter the drive type for this drive. Note that for SYSGEN purposes, there is no difference between an RP04 and an RP05 drive.

- \* CP1008 How many RM02/03/05/80/RP07 disk drives do you  
\* have? [D R:0.-63. D:0.]:

Enter the total number of RM02/03/05/80/RP07 disk drives in the target configuration. Each RH MASSBUS controller can support as many as eight drives.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP1020 Are any of the units dual-access? [Y/N D:N]:

This question appears if your target configuration includes more than one RH MASSBUS controller. Enter Yes if any of the units are dual-access.

The RM02/03/05/80/RP07 disk drives can be connected to two controllers at one time; either controller can access the disk at the option of the system software.

\* CP1036 What is the physical unit number of DRn:? [0 R:0-7 D:n]:

Enter the physical unit number (found on the unit plug) for each RM02/03/05/80/RP07 drive.

\* CP1040 Is DRn: a dual-access unit? [Y/N D:N]:

This question appears only if you indicated that your target system includes dual-access RM02/03/05/80/RP07 disk drives. Enter Yes to designate this drive as a dual-access unit.

\* CP1044 To which RH controller is DRn: connected? [S R:1-1]:

RH controllers are named alphabetically: the first is RHA, the second RHB, the third RHC, and the fourth RHD. Enter the RH controller name for each DR: device. (Normally, all DR: devices are on the same RH.)

If you designated DRn: as a dual-access device, this question does not appear and Question CP1048 appears instead.

\* CP1048 To which RH controller is port n of DRn: connected? [S R:1-1]:

If you designated DRn: as a dual-access drive, you must specify the port connection of the device. Enter the controller connection for each port of the device.

\* CP1060 Is DRn: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]:

Enter the drive type for this drive.

\* CP1208 How many RS03/04 disk drives do you have? [D R:0.-63. D:0.]:

Enter the total number of RS03/04 disk drives in the target configuration. Each RH controller can support as many as eight RS03/04 disk drives.

\* CP1236 What is the physical unit number of DSn:? [0 R:0-7 D:n]:

Enter the physical unit number for each RS03/04 drive.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP1244 To which RH controller is DS<sub>n</sub>: connected? [S R:1-1]:

RH controllers are named alphabetically: the first is RHA, the second is RHB, the third RHC, and the fourth is RHD. Enter the RH controller name for each DS: device. (Normally, all DS: devices are on the same RH.)

\* CP1260 Is DS<sub>n</sub>: an RS03 or RS04? [S R:4-4 D:"RS04"]:

Enter the drive type for this drive.

\* CP1408 How many ML11 disks do you have? [D R:0.-63. D:0.]:

Enter the total number of ML11 semiconductor disk emulator units in the target configuration.

\* CP1436 What is the physical unit number of EM<sub>n</sub>:? [O R:0-7 D:n]:

Enter the physical unit number for each ML11 unit.

\* CP1444 To which RH controller is EM<sub>n</sub>: connected? [S R:1-1]:

RH controllers are named alphabetically: the first is RHA, the second is RHB, the third is RHC, and the fourth is RHD. Enter the RH controller name for each EM: device. (Normally, all EM: devices are on the same RH.)

\* CP1608 How many TU16/45/77/TE16 tape drives do you have? [D R:0.-n. D:0.]:

Enter the total number of TU16/45/77/TE16 magnetic tape drives in the target configuration. Each RH controller can support as many as 64(decimal) magnetic tape drives. (The drives interface to the controller through a TM02/03 formatter.)

\* CP1612 How many TM02/03 magtape formatters do you have? [D R:1.-n. D:n]:

Enter the number of TM02/03 magnetic tape formatters.

The TU16/45/77/TE16 magnetic tape subsystem interfaces to the RH controller through a TM02/03 formatter. Each formatter is connected to the RH controller as one physical unit, and, in turn, can support as many as eight drives (as many as four TU77 drives).

\* CP1636 What is the physical unit number of the next formatter? [O R:0-7 D:n]:

Enter the physical unit number for each TM02/03 formatter.

The physical unit number of a formatter is not determined by the easily visible white unit number plug (or other indicator) on the tape drive. Instead, the physical unit number of a formatter must be

## PERIPHERAL CONFIGURATION (Cont.)

determined from the formatter itself. The TM02/03 formatter is usually located behind the lower front door of the first tape drive connected to the formatter (the "master" drive). The physical unit number of the formatter is indicated by the white unit number plug inserted into it.

**\* CP1644 To which RH controller is MMn: connected? [S R:l-1]:**

RH controller names increment alphabetically: the first is RHA, the second is RHB, the third is RHC, and the fourth is RHD. Enter the RH controller name for each formatter. (Normally all TM02/03 formatters are on the same RH.)

**\* CP1652 How many tape drives are attached to this  
\* formatter? [D R:l.-n. D:n]:**

Enter the number of MM: drives physically connected to this formatter.

**\* CP1656 What is the physical unit number of MMn:? [O R:0-7 D:n]:**

Enter the physical unit number of this tape drive on its formatter. This is the number that appears on the unit number plug or on the thumbwheel switch located on the front of the tape drive.

If you have eight or fewer magnetic tape drives (four or fewer TU77 drives), for convenience you should make the physical unit numbers match the logical unit numbers.

### NOTE

Only four TU77 drives are allowed on a formatter. Therefore, TU77 drives cannot have physical unit numbers greater than 3. SYSGEN cannot tell if you have TU77 drives and so does not detect the error if you specify physical unit numbers greater than 3 for TU77 drives. Those tape drives will not be usable in the resulting system.

**\* CP2068 Enter the vector address of RHx [O R:60-774 D:n]:**

Enter the interrupt vector address for each RH controller. The acceptable range is 60 through 774(octal).

**\* CP2072 What is its CSR address? [O R:160000-177700 D:n]:**

Enter the CSR address for each RH controller. The acceptable range is 160000 through 177700(octal).

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP2204 How many RK11 cartridge disk controllers do you have? [O D:0]:**

Enter the number of RK11 disk controllers in the target configuration.

The RK11 is the controller for the RK05 disk subsystem. Each RK11 controller can serve as many as eight RK05 removable-cartridge drives or four RK05F fixed-platter drives.

**\* CP2208 How many RK05F fixed platter drives do you have? [O D:0]:**

Enter the number of RK05F fixed-platter drives in the target configuration. The RK05F uses a double-density, fixed-platter drive and interfaces to the RK11 such that it appears as two RK05 drives.

NOTE

Enter the actual number of RK05F drives. Do not multiply the number by 2.

**\* CP2216 How many RK05 removable cartridge drives do you have? [O D:0]:**

Enter the number of RK05 removable-cartridge drives in the target configuration.

**\* CP2232 Is DKn: an RK05 or RK05F? [S R:4-5 D:"RK05"]:**

This question appears only if your system includes both fixed-platter (RK05F) and removable-cartridge (RK05) drives.

Enter the drive type for this drive.

**\* CP2236 What is the physical unit number of DKn:? [O R:0-7 D:n]:**

Enter the physical unit number for each drive. Note that the physical unit number for an RK05F must be even (that is, 0, 2, 4, or 6).

**\* CP2244 To which DK controller is DKn: connected? [S R:1-1]:**

This question appears only if the target configuration includes two or more RK11 controllers.

Enter the controller name to which each unit is physically connected. Note that RK11 controller names are of the form DKx, where x is a character from the DIGITAL standard alphabet (the DIGITAL alphabet omits G, I, O, and Q for clarity).

**\* CP2268 Enter the vector address of DKx [O R:60-774 D:220]:**

Enter the interrupt vector address for each RK11 controller. The acceptable range is 60 through 774(octal). The default value for the first RK11 (DKA) is 220(octal).

Subsequent RK11 controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP2272 What is its CSR address? [O R:160000-177700 D:177404]:

Enter the CSR address for each RK11 controller. The acceptable range is 160000 through 177700(octal). The default value for the first RK11 (DKA) is 177404(octal).

### NOTE

Unlike the control and status register (CSR) for most devices, the CSR for the RK11/RK05 is not the first of the device registers. The CSR is the third device register (offset 4 from the beginning of the device registers). Therefore, be careful when specifying the CSR addresses for these devices. For example, if the first RK11 controller is listed at 177400(octal), the CSR address is 177404(octal).

If you enter the wrong CSR address, you can correct it after SYSGEN by using the VMR or MCR CON command.

Subsequent RK11 controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

\* CP2404 How many RK611/711 disk cartridge controllers do you have? [O D:0]:

Enter the number of RK611/711 disk controllers in the target configuration.

The RK611/711 is the controller for the RK06/07 disk subsystem. Each RK611/711 controller can serve as many as eight RK06/07 drives.

\* CP2408 How many RK06/RK07 disk drives do you have? [D R:1.-63. D:1.]:

Enter the total number of RK06/07 disk drives in the target configuration.

\* CP2420 Are any of the units dual-access? [Y/N D:N]:

The RK06/07 disk drives can be connected to two RK611/711 controllers at one time; either controller can access the disk at the option of the system software. If your target configuration includes more than one RK611/711 controller, you must specify whether any of the RK06/07 units are dual-access.

\* CP2436 What is the physical unit number of DMn:? [O R:0-7 D:n]:

Enter the physical unit number for each RK06/07 drive.

\* CP2440 Is DMn: a dual-access unit? [Y/N D:N]:

This question appears only if you indicated that your target system included dual-access RK06/07 drives.

Enter Yes to designate this drive as a dual-access unit.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP2444 To which DM controller is DMn: connected? [S R:1-1]:**

This question appears only if the target configuration includes two or more RK611/711 controllers.

Enter the controller name to which each unit is physically connected. Note that RK611/711 controller names are of the form DMx, where x is a character from the DIGITAL standard alphabet (the DIGITAL alphabet omits G, I, O, and Q for clarity).

If you designated DMn: as a dual-access device, this question does not appear and Question CP2448 appears instead.

**\* CP2448 To which DM controller is port n of DMn: connected? [S R:1-1]:**

Enter the name of the controller to which each port is physically connected.

**\* CP2460 Is DMn: an RK06 or RK07? [S R:4-4 D:"RK07"]:**

Enter the drive type for this drive.

**\* CP2468 Enter the vector address of DMx [O R:60-774 D:210]:**

Enter the interrupt vector address for each RK611/711 controller. The acceptable range is 60 through 774(octal). The default value for the first RK611/711 (DMA) is 210(octal).

Subsequent RK611/711 controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP2472 What is its CSR address? [O R:160000-177700 D:177440]:**

Enter the CSR address for each RK611/711 controller. The acceptable range is 160000 through 177700(octal). The default value for the first RK611/711 (DMA) is 177440(octal).

Subsequent RK611/711 controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP2604 How many RL11/RLV11 disk cartridge controllers do you have? [O D:0]:**

Enter the number of RL11/RLV11 disk controllers in the target configuration.

The RL11/RLV11 is the controller for the RL01/RL02 disk subsystem. Each RL11/RLV11 controller can serve as many as four RL01/RL02 drives.

**\* CP2608 How many RL01/RL02 disk drives do you have? [D R:1.-63. D:1.]:**

Enter the total number of RL01/RL02 disk drives in the target configuration.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP2636 What is the physical unit number of DLn:? [O R:0-7 D:n]:

Enter the physical unit number for each RL01/RL02 drive.

\* CP2644 To which DL controller is DLn: connected? [S R:l-1]:

This question appears only if the target configuration includes two or more RL11/RLV11 controllers.

Enter the controller name to which each unit is physically connected.

\* CP2660 Is DLn: an RL01 or RL02? [S R:4-4 D:"RL02"]:

Enter the drive type for this drive.

\* CP2668 Enter the vector address of DLx [O R:60-774 D:160]:

Enter the interrupt vector address for each RL11/RLV11 disk controller. The acceptable range is 60 through 774(octal). The default value for the first controller (DLA) is 160(octal).

Subsequent RL11/RLV11 disk controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

\* CP2672 What is its CSR address? [O R:160000-177700 D:174400]:

Enter the CSR address for each RL11/RLV11 disk controller. The acceptable range is 160000 through 177700(octal). The default CSR address for the first RL11/RLV11 controller (DLA) is 174400(octal).

Subsequent RL11/RLV11 disk controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

\* CP2804 How many RP11 disk pack controllers do you have? [O D:0]:

Enter the number of RP11 disk controllers in the target configuration.

The RP11 is the controller for the RP02/RPR02/RP03 disk subsystem. Each RP11 controller can serve as many as eight RP02/RPR02/RP03 drives.

\* CP2808 How many RP02/RPR02/RP03 disk drives do you  
\* have? [D R:l.-63. D:1.]:

Enter the total number of RP02/RPR02/RP03 disk drives in the target configuration.

\* CP2836 What is the physical unit number of DPn:? [O R:0-7 D:n]:

Enter the physical unit number for each RP02/RPR02/RP03 drive.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP2844 To which DP controller is DPn: connected? [S R:1-1]:**

This question appears only if the target configuration includes two or more RP11 controllers.

Enter the controller name to which each unit is physically connected. Note that RP11 controller names are of the form DPx, where x is a character from the DIGITAL standard alphabet (the DIGITAL alphabet omits G, I, O, and Q for clarity).

**\* CP2860 Is DPn: an RP02, RPR02, or RP03? [S R:4-5 D:"RP03"]:**

Enter the drive type for this drive. Note that for SYSGEN purposes, there is no difference between an RP02 and RPR02 drive.

**\* CP2868 Enter the vector address of DPx [O R:60-774 D:254]:**

Enter the interrupt vector address for each RP11 controller. The acceptable range is 60 through 774(octal). The default value for the first RP11 (DPA) is 254(octal).

Subsequent RP11 controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP2872 What is its CSR address? [O R:160000-177700 D:176714]:**

Enter the CSR address for each RP11 controller. The acceptable range is 160000 through 177700(octal). The default value for the first RP11 (DPA) is 176714(octal).

Subsequent RP11 controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP3004 How many MSCP disk controllers do you have? [D R:0.-10. D:0.]:**

Enter the number of Mass Storage Control Protocol (MSCP) disk controllers in your target configuration. The RQDX1, RQDX2, RQDX3, RUX50, RQC25, RUC25, KDA50, and UDA50 are MSCP controllers; all the devices listed in the description following Question CP3008 use an MSCP controller.

The maximum number of MSCP and TMSCP controllers combined is 10(decimal). For example, if you specify eight MSCP controllers in response to this question, you can specify only two TMSCP controllers in response to question CP3404.

If you enter 0 or take the default, SYSGEN proceeds to Question CP3404. Otherwise, SYSGEN proceeds to Question CP3008.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP3008 How many MSCP disk drives do you have? [D R:1.-n. D:1.]:**

Enter the total number of MSCP disk drives in your target configuration. The following are MSCP disk drives:

RX50  
RD51  
RD52  
RD53  
RC25  
RA60  
RA80  
RA81

The RX50 contains two 5.25-inch diskette drives, each with a formatted capacity of 400(octal) kilobytes. You should count each RX50 unit (with two diskette drives) as two drives.

The RD51 is a 5.25-inch fixed disk with a formatted capacity of 10 megabytes. The RD52 and RD53 are similar, except that the RD52 has a formatted capacity of 31 megabytes and the RD53 has a formatted capacity of 71 megabytes.

The RC25 contains both a fixed and a removable disk; both disks mount on the same drive spindle. Each disk has a formatted capacity of 25 megabytes. You should count each RC25 unit (with two disks: one fixed, one removable) as two drives.

The RA60 is a removable disk drive, with a formatted capacity of 205 megabytes.

The RA80 is a fixed disk with a formatted capacity of 121 megabytes.

The RA81 is a fixed disk with a formatted capacity of 456 megabytes.

**\* CP3036 What is the physical unit number of DUn:? [O R:0-377 D:n]:**

Enter the physical unit number for each MSCP drive.

The physical unit number of a drive is the number shown on the unit number plug (or other indicator) on the drive. All MSCP devices are DU-type devices.

**\* CP3044 To which DU controller is DUn: connected? [S R:1-1]:**

This question appears only if the target configuration includes two or more MSCP controllers.

Enter the controller name to which each unit is physically connected.

**\* CP3068 Enter the vector address of DUx [O R:60-774 D:154]:**

Enter the interrupt vector address for each MSCP controller. The acceptable range is 60 through 774(octal). The default value for the first MSCP controller (DUA) is 154(octal).

Subsequent MSCP controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP3072 What is its CSR address? [O R:160000-177700 D:172150]:**

Enter the CSR address for each MSCP controller. The acceptable range is 160000 through 177700(octal). The default value for the first MSCP controller (DUA) is 172150(octal).

Subsequent MSCP controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP3404 How many TMSCP tape controllers do you have? [D R:0.-10. D:0.]:**

Enter the number of Tape Mass Storage Control Protocol (TMSCP) tape controllers in your target configuration. The TK50 magnetic tape cartridge and the TU81 magnetic tape drives both use TMSCP controllers; each controller controls one MU-type unit.

The maximum number of MSCP and TMSCP controllers combined is 10(decimal). For example, if you specify four MSCP controllers in response to question CP3004, you can specify only six TMSCP controllers in response to this question.

If you enter 0 or take the default, SYSGEN proceeds to Question CP4004. Otherwise, SYSGEN proceeds to Question CP3468.

**\* CP3468 Enter the vector address of MUX [O R:60-774 D:260]:**

Enter the interrupt vector address for each TMSCP controller. The acceptable range is 60 through 774(octal). The default value for the first TMSCP controller (DUA) is 260(octal).

Subsequent TMSCP controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP3472 What is its CSR address? [O R:160000-177700 D:174500]:**

Enter the CSR address for each TMSCP controller. The acceptable range is 160000 through 177700(octal). The default value for the first TMSCP controller (MUA) is 174500(octal).

Subsequent TMSCP controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP4004 How many CM/CR11 card readers do you have? [O D:0]:**

Enter the number of CM/CR11 card readers in the target configuration. (The card reader controllers do not support multiple units per controller.)

If you enter a value greater than 0, you must specify the time-out interval, the interrupt vector address, and the CSR address for each controller.

## PERIPHERAL CONFIGURATION (Cont.)

- \* CP4008 Enter the number of seconds between  
\* card reader-not-ready messages [D R:0.-255. D:15.]:

Enter the number of seconds you want the system to wait between card reader-not-ready messages. (TKTN prints the messages at the console terminal.) The acceptable range is 0 through 255(decimal). The default response prints card reader-not-ready messages every 15 seconds.

To suppress the messages, enter 0.

- \* CP4068 Enter vector address of the next CM/CR11 [O R:60-774 D:230]:

Enter the interrupt vector address for each CM/CR11 card reader controller. The acceptable range is 60 through 774(octal). The default value for the first controller is 230(octal).

Subsequent CM/CR11 controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

- \* CP4072 What is its CSR address? [O R:160000-177700 D:177160]:

Enter the CSR address for each CM/CR11 card reader controller. The acceptable range is 160000 through 177700(octal). The default value for the first controller is 177160(octal).

Subsequent CM/CR11 controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

- \* CP4204 How many TAll dual cassettes do you have? [O D:0]:

Enter the number of TAll dual-drive magnetic tape cassette systems in the target configuration. If you enter a value greater than 0, you must specify the interrupt vector address and the CSR address for each controller.

- \* CP4268 Enter vector address of the next TAll [O R:60-774 D:260]:

Enter the interrupt vector address for each TAll cassette system. The acceptable range is 60 through 774(octal). The default value for the first TAll system is 260(octal).

Subsequent TAll cassette controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

- \* CP4272 What is its CSR address? [O R:160000-177700 D:177500]:

Enter the CSR address for each TAll cassette system. The acceptable range is 160000 through 177700(octal). The default value for the first system is 177500(octal).

Subsequent TAll cassette controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

## PERIPHERAL CONFIGURATION (Cont.)

- \* CP4404 How many TS11/TU80/TSV05/TK25  
\* magtape controllers do you have? [O D:0]:

Enter the number of TS11/TU80/TSV05/TK25 magnetic tape controllers in the target configuration.

If you enter a value greater than 0, you must specify the interrupt vector address and the CSR address for each controller.

- \* CP4468 Enter vector address of the next  
\* TS11/TU80/TSV05/TK25 [O R:60-774 D:224]:

Enter the interrupt vector address for each TS11/TU80/TSV05/TK25 magnetic tape controller. The acceptable range is 60 through 774(octal). The default value for the first controller is 224(octal).

Subsequent TS11/TU80/TSV05/TK25 controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

- \* CP4472 What is its CSR address? [O R:160000-177700 D:172522]:

Enter the CSR address for each TS11/TU80/TSV05/TK25 magnetic tape controller. The acceptable range is 160000 through 177700(octal). The default CSR address for the first controller is 172522(octal).

Subsequent TS11/TU80/TSV05/TK25 magnetic tape controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

- \* CP4604 How many TC11 DECTape controllers do you have? [O D:0]:

The TC11 is the controller for the TU56 DECTape subsystem. Each TC11 controller can serve a maximum of four dual-transport DECTape drives.

Enter the number of TC11 DECTape controllers in the target configuration.

If you enter a value greater than 0, you must specify the interrupt vector address, the CSR address, and the number of TU56 drives for each controller.

- \* CP4668 Enter vector address of the next TC11 [O R:60-774 D:214]:

Enter the interrupt vector address for each TC11 DECTape controller. The acceptable range is 60 through 774(octal). The default value for the first controller is 214(octal).

Subsequent TC11 DECTape controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP4672 What is its CSR address? [O R:160000-177700 D:177342]:**

Enter the CSR address for each TC11 DECTape controller. The acceptable range is 160000 through 177700(octal). The default CSR address for the first TC11 controller is 177342(octal).

Subsequent TC11 DECTape controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP4676 How many drives does DTx have? [D R:1.-8. D:2.]:**

Enter the number of TU56 drives on the controller. The acceptable range is 1 through 8.

Each TC11 DECTape controller supports as many as four dual transport TU56 drives.

**\* CP4804 How many RX11 disk controllers do you have? [O D:0]:**

The RX11 is the controller for the RX01 diskette system. Each RX11 controller can serve as many as two RX01 diskette drives.

Enter the number of RX11 diskette controllers in the target configuration. If you enter a value greater than 0, you must specify the interrupt vector address, the CSR address, and the number of RX01 drives for each controller.

**\* CP4868 Enter vector address of the next RX11 [O R:60-774 D:264]:**

Enter the interrupt vector address for each RX11 diskette controller. The acceptable range is 60 through 774(octal). The default value for the first RX11 controller is 264(octal).

Subsequent RX11 diskette controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP4872 What is its CSR address? [O R:160000-177700 D:177170]:**

Enter the CSR address for each RX11 diskette controller. The acceptable range is 160000 through 177700(octal). The default CSR address for the first RX11 controller is 177170(octal).

Subsequent RX11 diskette controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP4876 How many drives does DXx have? [D R:1.-2. D:2.]:**

Enter the number of RX01 drives on the controller. The acceptable range is 1 through 2.

Each RX11 diskette controller supports as many as two RX01 diskette drives.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP5004 How many RX211/RXV21 disk controllers do you have? [O D:0]:**

Enter the number of RX211/RXV21 diskette controllers in the target configuration.

The RX211/RXV21 is the controller for the dual-density (single or double density) RX02 diskette system. Each RX211/RXV21 controller can serve as many as two RX02 diskette drives.

If you enter a value greater than 0, you must specify the interrupt vector address, the CSR address, and the number of RX02 drives for each controller.

**\* CP5068 Enter vector address of the next RX211/RXV21 [O R:60-774 D:264]:**

Enter the interrupt vector address for each RX211/RXV21 diskette controller. The acceptable range is 60 through 774(octal). The default value for the first RX211/RXV21 controller is 264(octal).

Subsequent RX211/RXV21 diskette controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP5072 What is its CSR address? [O R:160000-177700 D:177170]:**

Enter the CSR address for each RX211/RXV21 diskette controller. The acceptable range is 160000 through 177700(octal). The default CSR address for the first RX211 controller is 177170(octal).

Subsequent RX211/RXV21 diskette controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP5076 How many drives does DYx have? [D R:1.-2. D:2.]:**

Enter the number of RX02 drives on the controller. The acceptable range is 1 through 2.

Each RX211/RXV21 diskette controller supports as many as two RX02 diskette drives.

**\* CP5204 How many TU58 controllers do you have? [O D:0]:**

Enter the number of TU58 DECTape II controllers in the target configuration.

The TU58 is the controller for the DECTape II subsystem. Each TU58 controller can serve as many as two DECTape II drives.

If you enter a value greater than 0, you must specify the interrupt vector address, the CSR address, and the number of DECTape II drives for each TU58 controller.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP5268 Enter vector address of next TU58 [O R:60-774 D:300]:**

Enter the interrupt vector address for each TU58 DECTape II controller. The acceptable range is 60 through 774(octal). The default value for the first controller is 300(octal).

Subsequent TU58 DECTape II controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP5272 What is its CSR address? [O R:160000-177700 D:176500]:**

Enter the CSR address for each TU58 DECTape II controller. The acceptable range is 160000 through 177700(octal). The default CSR address for the first TU58 controller is 176500(octal).

Subsequent TU58 DECTape II controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP5276 How many drives does DDx have? [D R:1.-2. D:2.]:**

Enter the number of DECTape II drives on the controller. The acceptable range is 1 through 2.

Each TU58 DECTape II controller can support as many as two DECTape II drives.

**\* CP5404 How many LP/LS/LV11/LA180 line printers do you have? [O D:0]:**

Enter the number of line printer controllers in the target configuration.

If you enter a value greater than 0, you must specify the timeout interval (for printer-not-ready messages), the interrupt vector address, the CSR address, and the line printer type.

**\* CP5408 Enter the number of seconds between  
\* line printer-not-ready messages [D R:0.-255. D:15.]:**

Enter the number of seconds you want the system to wait between line printer-not-ready messages. (TKTN prints the messages at the console terminal.) The acceptable range is 0 through 255(decimal). The default response prints line printer-not-ready messages every 15 seconds.

To suppress the messages, enter 0.

**\* CP5468 Enter vector address of the next line  
\* printer [O R:60-774 D:200]:**

Enter the interrupt vector address for each line printer controller. The acceptable range is 60 through 774(octal). The default value for the first controller is 200(octal).

## PERIPHERAL CONFIGURATION (Cont.)

Subsequent line printer controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

\* CP5472 What is its CSR address? [O R:160000-177700 D:177514]:

Enter the CSR address for each line printer controller. The acceptable range is 160000 through 177700(octal). The default value for the first controller is 177514(octal).

Subsequent line printer controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

\* CP5480 Enter line printer type for LPx [S R:4-5 D:"LP25"]:

The following is a table of the valid line printer types and their characteristics:

Printer Type	Controller	No. of Columns	Lines per Minute	Supports Optimization
LA180	LA180	132	150	no
LN01	LN01	132	600	n/a
LP01	LP11-F/H	80	170-1110	yes
LP02	LP11-J/K	132	170-1110	yes
LP04	LP11-R/S	132	1110	yes
LP05	LP11-V/W	132	300	no
LP06	LP11-Y/Z	132	460-600	no
LP07	LP11-G	132	1200	no
LP14	LP11-C/D	132	660-900	no
LP25	LP11-A/B	132	215-300	no
LP26	LP11-E	132	445-600	no
LP27	LP11-U	132	800-1200	no
LS11	LS11	132	60-200	no
LV01	LV11	132	500	yes

The printer type is used to set two characteristics in the UCB:

- Column or buffer width

You can set this characteristic in VMR or MCR with the SET /BUF command.

- Fast line printer support

This support allows the driver to eliminate unnecessary print cycles. You cannot set this characteristic in VMR or MCR. Fast line printer support does not apply to the LN01 printer.

If you specify the wrong printer type and the driver does not support fast line printing, you may occasionally lose a line of a listing when the printer is taken off line or you might cause the printer to run a little more slowly, but there will be no other adverse effects.

## PERIPHERAL CONFIGURATION (Cont.)

If you do not know the correct printer type for your printer, take the default. This will give you a 132-column printer without fast line printer support. Once your system is running, you can change the number of columns if necessary with the MCR command SET.

**\* CP5484 Does LPx have lowercase characters? [Y/N D:N]:**

Enter Yes if your line printer has both uppercase and lowercase characters. If it only has uppercase characters, enter No.

Your answer determines the initial setting for lowercase character conversion on this printer. You can change this setting at any time by using the MCR command SET /LOWER.

**\* CP5604 How many TM/TMA/TMB11 magtape controllers do you have? [0 D:0]:**

Enter the number of TM11 magnetic tape controllers in the target configuration.

The TM11 is the controller for the TU10, TU10W, TE10, and TS03 tape drives. Each TM11 can serve as many as eight tape drives.

If you enter a value greater than 0, you must specify the interrupt vector address, the CSR address, and the number of tape drives for each controller.

**\* CP5668 Enter vector address of the next  
\* TM/TMA/TMB11 [0 R:60-774 D:224]:**

Enter the interrupt vector address for each TM11 magnetic tape controller. The acceptable range is 60 through 774(octal). The default value for the first controller is 224(octal).

Subsequent TM11 controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP5672 What is its CSR address? [0 R:160000-177700 D:172522]:**

Enter the CSR address for each TM11 controller. The acceptable range is 160000 through 177700(octal). The default CSR address for the first TM11 is 172522(octal).

Subsequent TM11 controllers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP5676 How many drives does MTx have? [D R:1.-8. D:1.]:**

Enter the number of magnetic tape drives on the controller. The acceptable range is 1 through 8.

Each TM11 controller can support as many as eight TU10, TU10W, TE10, or TS03 magnetic tape drives.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP5804 How many PC11 paper tape reader/punches do you have? [O D:0]:**

Enter the number of PC11 paper tape reader/punches in the target configuration.

If you enter a value greater than 0, you must specify the interrupt vector address and the CSR address for each PC11 paper tape controller.

In your generated system, a PC11 paper tape reader/punch will be treated as two separate devices, a paper tape punch (PP) and a paper tape reader (PR). For example, if you have one PC11 and one PR11 paper tape reader, your resulting system will have one PP device in it and two PR devices. The one PP and the first PR represent the PC11 paper tape reader/punch. The second PR represents the PR11 reader.

**\* CP5868 Enter vector address of the next PC11 [O R:60-774 D:70]:**

Enter the interrupt vector address for each PC11 controller. The acceptable range is 60 through 774(octal). The default is 70(octal).

Subsequent PC11 controllers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

**\* CP5872 What is its CSR address? [O R:160000-177700 D:177550]:**

Enter the CSR address for each PC11 paper tape reader/punch. The acceptable range is 160000 through 177700(octal). The default CSR address for the first PC11 is 177550(octal).

Subsequent PC11 paper tape reader/punches do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP6004 How many PR11 paper tape readers do you have? [O D:0]:**

Enter the number of PR11 paper tape readers in the target configuration. Do not include any PC11 paper tape reader/punches you may have in this number.

If you enter a value greater than 0, you must specify the interrupt vector address and the CSR address for each paper tape reader.

**\* CP6068 Enter vector address of the next PR11 [O R:60-774 D:70]:**

Enter the interrupt vector address for each paper tape reader. The acceptable range is 60 through 774(octal). The default is 70(octal).

Subsequent paper tape readers do not have a default for the interrupt vector address; therefore, you must enter a value within the acceptable range.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP6072 What is its CSR address? [O R:160000-177700 D:177550]:**

Enter the CSR address for each paper tape reader. The acceptable range is 160000 through 177700(octal). The default CSR address is 177550(octal).

Subsequent paper tape readers do not have a default for the CSR address; therefore, you must enter a value within the acceptable range.

**\* CP6204 How many LPAll lab subsystems do you have? [D R:0.-16. D:0.]:**

Enter the number of LPAll-K laboratory subsystems in the target configuration.

If you enter a value greater than 0, you must specify the interrupt vector address and the CSR address for each LPAll-K.

**\* CP6268 Enter vector address of the next LPAll [O R:300-774]:**

Enter the interrupt vector address for each LPAll-K subsystem. The acceptable range is 300 through 774(octal). There is no default.

The vector address is assigned from floating vector space; consult DIGITAL Field Service if the location is unknown.

**\* CP6272 What is its CSR address? [O R:160000-177700 D:170460]:**

Enter the CSR address for the LPAll-K subsystem. The acceptable range is 160000 through 177700(octal). The default is 170460. There is no default CSR for a subsequent LPAll-K.

The required CSR address is that of the first word of the LPAll-K CSR group. Consult DIGITAL Field Service if the location is unknown.

**\* CP6280 What is the maximum number of UMRs to be saved? [D R:0.-24. D:5.]:**

The LPAll-K driver can handle up to 8 concurrent NPR transfers, each of which must be mapped through UNIBUS Mapping Registers (UMRs). Enter the maximum number of UMRs that the driver may access at any instant to map all requests that may be active.

**\* CP6804 Enter number of additional DL11/DLV11 line interfaces [O D:0]:**

Enter the number of additional DL11/DLV11 line interfaces in the target configuration. Enter only the number of DL11/DLV11 line interfaces used as terminal interfaces. Do not include any DL11/DLV11 interfaces used as controllers for TU58 DECTape II drives.

An RSX-11M-PLUS system requires a DL11/DLV11 line interface for operation. SYSGEN automatically generates the data base for the required DL11/DLV11.

If your system includes an additional DL11/DLV11, you must specify the type of terminal and whether the line requires modem support as well as the interrupt vector and CSR addresses.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP6820 Do any of the DL11/DLV11 lines require modem support? [Y/N D:N]:

Enter Yes if any of the DL11/DLV11 lines will be used as dial-up lines.

\* CP6832 Enter terminal type for YLx [S R:4-6 D:"LA120"]:

Your answer to this question establishes the default terminal type for the YL controller. You can change the default terminal types at any time without performing a new SYSGEN, so you should choose the default answer for this question if you do not know which terminal types are or will be connected. See Chapter 4 for more information on changing default terminal types.

RSX-11M-PLUS SYSGEN supports the following types of terminals:

ASR33	LA12	VT05B
ASR35	LA30P	VT50
	LA30S	VT52
DTC01	LA34	VT55
	LA36	VT61
KSR33	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
	LN03	VT131
		VT132
	PC3xx	VT2xx

\* CP6868 Enter vector address of YLx [O R:300-770]:

Enter a value within the range 300 through 770(octal). Consult DIGITAL Field Service if the interrupt vector addresses of additional lines are unknown.

The standard interrupt vector address for the first DL11/DLV11 line (YLA, the required line) is 60(octal). Interrupt vector addresses for additional DL11/DLV11 lines are assigned from the floating vector space starting at 300(octal). There are no default vector addresses for any additional DL11/DLV11 lines.

\* CP6872 What is its CSR address? [O R:160000-177700]:

The standard CSR address for the first DL11/DLV11 line (YLA, the required line) is 177560(octal). CSR addresses for additional DL11/DLV11 lines are assigned from floating address space starting at 176000(octal). There are no default CSR addresses for any additional DL11/DLV11 lines. You must enter a value within the range 176000 through 176770(octal). Consult DIGITAL Field Service if the CSR addresses of additional lines are unknown.

## PERIPHERAL CONFIGURATION (Cont.)

- \* CP7004 Enter number of DH11 asynchronous line multiplexers [D R:0.-n. D:0.]:

Enter the number of DH11 asynchronous line multiplexers in the target configuration.

- \* CP7020 Enter total number of DH11 dial-up lines [D R:0.-n. D:0.]:

Enter the total number of dial-up lines. The acceptable range is 0 through 16(decimal) times the number of DH11 multiplexers specified in your response to Question CP7004.

One DH11 with a DM11-BB interface can serve as many as 16(decimal) remote lines that occupy consecutive line locations.

If you enter a number greater than 0, SYSGEN proceeds to Question CP7028. If you enter 0 or take the default, SYSGEN proceeds to Question CP7040.

- \* CP7028 At which baud rate do you want to answer? [S R:2-5 D:"300"]:

If your DH11 has remote lines, you must enter the default answer speed for the remote lines. The answer speed can be changed for individual lines with the MCR or VMR command SET /SPEED.

Acceptable answer speed baud rates for the DH11 are 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2400, 4800, or 9600. The default answer speed is 300. In addition, there are two external clock baud rates, EXTA and EXTB, that allow nonstandard baud rates. You must connect your DH11 to an external clock to use these. See the DH11 hardware documentation for more information.

- \* CP7040 Enter total number of DH11 local lines [D R:n.-n. D:n.]:

Local lines occupy consecutive line locations and DH11 multiplexers. Their assignment follows the assignment of any remote lines you specified in Question CP7020. The DH11 can serve as many as 16 lines per controller.

- \* CP7068 Enter vector address of YHx [O R:300-770]:

Enter a vector address in the range 300 through 770(octal). Consult DIGITAL Field Service if the interrupt vector address is unknown.

The interrupt vector address for the DH11 is assigned from floating vector space starting at location 300(octal). Therefore, there is no default vector assignment for the DH11.

- \* CP7072 What is its CSR address? [O R:160000-177700]:

Enter a CSR address, in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the DH11 is assigned from floating address space starting at 160010(octal). Therefore, there is no default CSR assignment for the DH11.

## PERIPHERAL CONFIGURATION (Cont.)

- \* CP7076 Enter vector address of the DM11-BB associated with YHx [O R:300-774]:

If you have a DH11 and you answered Question CP7020 ("total number of dial-up lines") with a number greater than 0, a DM11-BB is required. One DM11-BB can service as many as 16(decimal) dial-up lines.

The DM11-BB interrupt vector address is assigned from floating vector space starting at 300(octal). Therefore, you must enter a value in the range 300 through 774(octal) to include DM11-BB modem support. Consult DIGITAL Field Service if the interrupt vector address is unknown.

- \* CP7080 What is its CSR address? [O R:160000-177700 D:170500]:

The standard CSR address for the DM11-BB is 170500(octal). If you include DM11-BB support, enter 170500(octal) or a value in the range 160000 through 177700(octal) for the CSR assignment.

- \* CP7084 Enter terminal type for YHx [S R:4-6 D:"VT100"]:

Your answer to this question establishes the default terminal type for the YH controller. You can change the default terminal types at any time without performing a new SYSGEN, so you should choose the default answer for this question if you do not know which terminal types are or will be connected. See Chapter 4 for more information on changing default terminal types.

RSX-11M-PLUS SYSGEN supports the following types of terminals:

ASR33	LA12	VT05B
ASR35	LA30P	VT50
	LA30S	VT52
DTC01	LA34	VT55
	LA36	VT61
KSR33	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
	LN03	VT131
		VT132
	PC3xx	VT2xx

- \* CP7104 Enter number of DHU11/DHV11 asynchronous line multiplexers [D R:0.-n. D:0.]:

Enter the number of DHU11/DHV11 asynchronous line multiplexers in the target configuration.

- \* CP7120 Enter total number of DHU11/DHV11 dial-up lines [D R:0.-n. D:0.]:

Enter the total number of dial-up lines. SYSGEN assigns remote lines to consecutive line locations. If you enter more than 16 (for the DHU11) or 8 (for the DHV11) remote lines, they must also occupy consecutive DHU11s or DHV11s.

## PERIPHERAL CONFIGURATION (Cont.)

For the DHU11, the acceptable range is 0 through 16(decimal) times the number of DHU11 multiplexers specified in your response to Question CP7104.

For the DHV11, the acceptable range is 0 through 8(decimal) times the number of DHV11 multiplexers specified in your response to Question CP7104.

If you enter a number greater than 0, SYSGEN proceeds to Question CP7128. If you enter 0 or take the default, SYSGEN proceeds to Question CP7140.

**\* CP7128 At which baud rate do you want to answer? [S R:2-5 D:"300"]:**

If your DHU11/DHV11 has remote lines, you must enter the default answer speed for the remote lines. The answer speed can be changed for individual lines with the MCR or VMR command SET /SPEED.

Acceptable answer speed baud rates for the DHU11/DHV11 are 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, or 19200. The default answer speed is 300.

**\* CP7140 Enter total number of DHU11/DHV11 local lines [D R:n.-n. D:n.]:**

Local lines occupy consecutive line locations and DHU11/DHV11 multiplexers. Their assignment follows the assignment of any remote lines you specified in Question CP7120.

One DHU11 can serve as many as 16 lines; one DHV11 can serve as many as 8 lines.

**\* CP7168 Enter vector address of YVx [O R:300-770]:**

Enter a vector address in the range 300 through 770(octal). Consult DIGITAL Field Service if the interrupt vector address is unknown.

The interrupt vector address for the DHU11/DHV11 is assigned from floating vector space starting at location 300(octal). Therefore, there is no default vector assignment for the DHU11/DHV11.

**\* CP7172 What is its CSR address? [O R:160000-177700]:**

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the DHU11/DHV11 is assigned from floating address space starting at 160010(octal). Therefore, there is no default CSR assignment for the DHU11/DHV11.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP7184 Enter terminal type for YVx [S R:4-6 D:"VT100"]:

Your answer to this question establishes the default terminal type for the YV controller. You can change the default terminal types at any time without performing a new SYSGEN, so you should choose the default answer for this question if you do not know which terminal types are or will be connected. See Chapter 4 for more information on changing default terminal types.

RSX-11M-PLUS SYSGEN supports the following types of terminals:

ASR33	LA12	VT05B
ASR35	LA30P	VT50
	LA30S	VT52
DTC01	LA34	VT55
	LA36	VT61
KSR33	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
	LN03	VT131
		VT132
	PC3xx	VT2xx

\* CP7204 Enter number of DJ11 asynchronous line multiplexers [D R:0.-n. D:0.]:

Enter the number of DJ11 asynchronous line multiplexers in the target configuration.

If you enter a value greater than 0, you must specify the interrupt vector address, the CSR address, and the number of lines for each DJ11.

\* CP7268 Enter vector address of YJx [O R:300-770]:

Enter a vector address in the range 300 through 770(octal). Consult DIGITAL Field Service if the vector address is unknown.

The interrupt vector address for the DJ11 is assigned from floating vector space starting at 300(octal). Thus, there is no default vector assignment for the DJ11.

\* CP7272 What is its CSR address? [O R:160000-177700]:

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the DJ11 is assigned from floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the DJ11.

\* CP7280 How many lines does YJx have? [D R:1.-n. D:16.]:

Each DJ11 can serve as many as 16(decimal) asynchronous serial lines. Enter the total number of lines. The default is 16.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP7284 Enter terminal type for YJx [S R:4-6 D:"VT100"]:

Your answer to this question establishes the default terminal type for the YJ controller. You can change the default terminal types at any time without performing a new SYSGEN, so you should choose the default answer for this question if you do not know which terminal types are or will be connected. See Chapter 4 for more information on changing default terminal types.

RSX-11M-PLUS SYSGEN supports the following types of terminals:

ASR33	LA12	VT05B
ASR35	LA30P	VT50
	LA30S	VT52
DTC01	LA34	VT55
	LA36	VT61
KSR33	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
	LN03	VT131
		VT132
	PC3xx	VT2xx

\* CP7404 Enter number of DZ11/DZQ11/DZV11 asynchronous line multiplexers [D R:0.-n. D:0.]:

Enter the number of DZ11/DZQ11/DZV11 asynchronous line multiplexers in the target configuration.

\* CP7420 Do any of the DZ lines require modem support? [Y/N D:N]:

The DZ11/DZQ11/DZV11 can maintain a full-duplex connection through a full-duplex modem (for example, a Bell 103A-type modem). However, modem support requires additional code in the terminal data base as well as in the driver and thus increases system overhead; select modem support only if needed. If you wish to include modem support, you must specify the answer speed baud rate.

Note that if you include modem support, you can dynamically set the DZ11/DZQ11/DZV11 line type (local or remote) by using the /[NO]REMOTE keyword of the MCR command SET (see the RSX-11M/M-PLUS MCR Operations Manual).

\* CP7428 At which baud rate do you want to answer? [S R:2-5 D:"300"]:

Enter the default answer speed for the remote lines. The answer speed can be changed for individual lines with the MCR or VMR command SET /SPEED. Acceptable answer speed baud rates are 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, and 9600. The default is 300.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP7468 Enter vector address of YZx [O R:300-770]:**

The interrupt vector address for the DZ11/DZQ11/DZV11 is assigned from floating vector space starting at 300(octal). Thus, there is no default vector assignment for the DZ11/DZQ11/DZV11. Enter a vector address in the range 300 through 770(octal). Consult DIGITAL Field Service if the vector address is unknown.

**\* CP7472 What is its CSR address? [O R:160000-177700]:**

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the DZ11/DZQ11/DZV11 is assigned from floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the DZ11/DZQ11/DZV11.

**\* CP7480 How many lines does YZx have? [D R:1.-n. D:8.]:**

Enter the total number of lines. The default is 8.

Each DZ11 can serve as many as eight asynchronous lines. Each DZQ11 or DZV11 can serve as many as four asynchronous lines.

**\* CP7484 Enter terminal type for YZx [S R:4-6 D:"VT100"]:**

Your answer to this question establishes the default terminal type for the YZ controller. You can change the default terminal types at any time without performing a new SYSGEN, so you should choose the default answer for this question if you do not know which terminal types are or will be connected. See Chapter 4 for more information on changing default terminal types.

RSX-11M-PLUS SYSGEN supports the following types of terminals:

ASR33	LA12	VT05B
ASR35	LA30P	VT50
	LA30S	VT52
DTC01	LA34	VT55
	LA36	VT61
KSR33	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
	LN03	VT131
		VT132
	PC3xx	VT2xx

**\* CP7604 Do you have any intercomputer communication devices? [Y/N D:N]:**

Enter Yes if the target configuration includes any of the following intercomputer communication devices:

PCL11	receiver/transmitter
DMC11/DMR11	synchronous line interface
DUP11	synchronous line interface
DEUNA	Ethernet communications controller

## PERIPHERAL CONFIGURATION (Cont.)

Do not include any devices that will be used with DECnet. Those devices should be included when you generate DECnet using NETGEN. See the DECnet installation documentation for more information.

If you enter No, SYSGEN proceeds to Question CP9604.

**\* CP7804 How many PCL11 receiver/transmitters do you have? [O D:0]:**

Enter the number of PCL11 receiver/transmitters in the target configuration.

**\* CP7868 Enter vector address of the next PCL11 receiver [O R:300-774]:**

Enter a vector address in the range 300 through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

The interrupt vector address for the PCL11 receiver is assigned from floating vector space starting at 300(octal). Thus, there is no default vector address for the PCL11 receiver.

**\* CP7872 What is its CSR address? [O R:160000-177700]:**

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the PCL11 receiver is assigned from floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the PCL11 receiver.

**\* CP8068 Enter vector address of the next PCL11 transmitter [O R:300-774]:**

Enter a vector address in the range 300 through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

The interrupt vector address for the PCL11 transmitter is assigned from floating vector space starting at 300(octal). Thus, there is no default vector address for the PCL11 transmitter.

**\* CP8072 What is its CSR address? [O R:160000-177700]:**

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the PCL11 transmitter is assigned from floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the PCL11 transmitter.

**\* CP8204 How many DMC11/DMR11 synchronous line interfaces do you have? [O D:0]:**

Enter the number of DMC11/DMR11 communication links in the target configuration.

## PERIPHERAL CONFIGURATION (Cont.)

**\* CP8268 Enter vector address of the next DMC11/DMR11 [O R:300-774]:**

Enter a vector address in the range 300 through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

The vector address for the DMC11/DMR11 interprocessor link is assigned from floating vector space starting at 300(octal). Thus, there is no default interrupt vector address for the DMC11/DMR11.

**\* CP8272 What is its CSR address? [O R:160000-177700]:**

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the DMC11/DMR11 interprocessor link is assigned from the floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the DMC11/DMR11.

**\* CP8280 Is it a half-duplex line? [Y/N D:N]:**

Normally, the DMC11/DMR11 is a full-duplex serial communications link. When the DMC11/DMR11 is used on a half-duplex line, one end of the line must be the primary station and the other end must be the secondary station.

If you enter Yes, you must specify whether the line is the primary or secondary station.

**\* CP8284 Is it the primary station? [Y/N D:N]:**

Enter Yes to indicate that the line is a primary station. Enter No to indicate a secondary station.

**\* CP8404 How many DUP11 synchronous line interfaces do you have? [O D:0]:**

Enter the number of DUP11 synchronous line interfaces in the target configuration.

**\* CP8468 Enter vector address of the next DUP11 [O R:300-774]:**

Enter a vector address in the range 300 through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

The vector address for the DUP11 synchronous line interface is assigned from the floating vector space starting at 300(octal). Thus, there is no default interrupt vector address for the DUP11.

**\* CP8472 What is its CSR address? [O R:160000-177700]:**

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

The CSR address for the DUP11 synchronous line interface is assigned from the floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the DUP11.

## PERIPHERAL CONFIGURATION (Cont.)

\* CP8480 Is it a half-duplex line? [Y/N D:N]:

Enter Yes if the line is a half-duplex line.

Enter No if the line is a full-duplex line.

\* CP8484 How many sync characters are required in a sync leader? [D R:3.-14.]:

Enter a value in the range 3 through 14(decimal). A typical response is 4 through 6(decimal). If the line will run at high speeds or if you expect the system load to be heavy, specify a greater number of sync characters. There is no default for this question.

\* CP8504 How many DEUNA Ethernet controllers do you have? [O R:0-1 D:0]:

Enter the number of DEUNA Ethernet controllers in the target configuration.

\* CP8568 Enter vector address of the next DEUNA [O R:60-774 D:120]:

Enter the interrupt vector address for the DEUNA Ethernet controller. The acceptable range is 60 through 774(octal). The default value for the first controller is 120(octal).

\* CP8572 What is its CSR address? [O R:160000-177700 D:174510]:

Enter the CSR address for the DEUNA Ethernet controller. The acceptable range is 160010 through 177700(octal). The default CSR address for the first controller is 174510(octal).

\* CP9604 Enter device mnemonics for user-supplied drivers [S]:

If you do not wish to include any user-supplied drivers, press RETURN in response to this question. If you wish to include user-supplied drivers, enter the driver mnemonics in response to this question. Note that the device mnemonics you enter must not include a colon (:), and should start with the letters J or Q to avoid conflict with DIGITAL-supplied drivers.

The driver source files must reside in directory [11,10] and be named in the format ddDRV.MAC and ddTAB.MAC, where dd is the device mnemonic entered in this question. Any user-supplied drivers and their data bases will be assembled, task built, and loaded as part of the SYSGEN procedure.

When you have listed all the driver mnemonics, press RETURN in response to the prompt.

\* CP9612 Do you want the xx: driver to be loadable? [Y/N D:N]:

Enter Yes to make the specified driver loadable. Enter No to make the specified driver resident.

## PERIPHERAL CONFIGURATION (Cont.)

It is easier to change the device configuration if the driver and data base are both loadable. Unless you have a specific reason not to, you should enter Yes.

If you enter No, Question CP9616 does not appear, because if a driver is resident, its data base must also be resident.

**\* CP9616 Do you want the xx: driver's data base to be loadable? [Y/N D:N]:**

Enter Yes to make the data base for the specified driver loadable.  
Enter No to make the specified data base resident.

It is easier to change the device configuration if the driver and data base are both loadable. Unless you have a specific reason not to, you should enter Yes.

If you entered No to Question CP9612, this question does not appear, because if a driver is resident, its data base must also be resident.

**\* CP9632 What is the highest interrupt vector  
\* address? [0 R:n-774 D:n]:**

The highest interrupt vector address can range from 374 through 774(octal). SYSGEN uses the highest interrupt address you specified in answering the previous peripheral questions as the default for this question.

If you will be adding other devices after completing this system generation, or if you have included user-supplied drivers, you should set the highest interrupt vector address high enough to accommodate the vectors for those devices.

## ASSEMBLING EXECUTIVE

### 3.2.4 Assembling the Executive and Drivers (AE)

In this section, SYSGEN assembles the Executive, the drivers, and the driver data bases. SYSGEN allows you to decide whether you want assembly listings and, if so, to direct them to a file or to the line printer. After assembly is completed, SYSGEN creates the Executive object library file.

Your answers to the questions in this section are put in the saved answer file [200,200]SYSGENSA1.CMD.

The following questions are asked before SYSGEN begins assembling the Executive and drivers. If you are not performing a PREPGEN, you will have to wait until the assembly is completed before being asked the questions in the next section.

**\* AE010 Do you want assembly listings of the Executive and drivers? [Y/N D:N]:**

Enter Yes if you wish to produce assembly listings. Because assembly listings require considerable time to produce and usually are not needed, you should enter No.

If you enter Yes, you must specify the listing device.

**\* AE020 What is to be the listing device [ddu:]? [S R:2-5 D:"SY:"]:**

Enter the device for the assembly listing files. If you omit the colon from the device specification, SYSGEN appends a colon.

If the listing device is a disk, the listings are put in directory [11,34]. SYSGEN creates this directory if it does not already exist on the listing device.

**\* AE030 Do you wish to pause to edit any files before assembling? [Y/N D:N]:**

If you need to edit any of the assembly files, enter Yes. SYSGEN pauses and allows you to invoke an editor of your choice.

#### NOTE

If you are performing SYSGEN on a VAX host computer running VAX-11 RSX, you cannot use EDT to edit files; you must use EDI instead.

If your host system is RSX-11M-PLUS, enter the following command line to continue with SYSGEN after pausing:

>UNS AT. RET

## ASSEMBLING EXECUTIVE (Cont.)

If your host system is VAX-11 RSX, enter the following command line to continue with SYSGEN after pausing:

>RES RET

SYSGEN then begins assembling the Executive and drivers.

## BUILDING EXECUTIVE

### 3.2.5 Building the Executive and Drivers (BE)

In this section, SYSGEN task builds the Executive and the drivers. The Executive and driver task image files are put in directory [1,54] on the target system disk. If there is an old system from a previous system generation in directory [1,54], SYSGEN will transfer it to another directory before building the new system if you wish.

Your answers to the questions in this section are put in the saved answer file [200,200]SYSGENSA1.CMD.

The following is a description of all the possible questions in the Building the Executive and Drivers section.

\* BE010 Do you want to move the old system in [1,54] to another dirctory? [Y/N D:N]:

If there is an old system image file (RSX11M.SYS) in directory [1,54] on your target system disk, SYSGEN asks this question to allow you to move that system and its associated files to another directory before building the new system in [1,54].

If you want to save files on the target disk from a previous SYSGEN, enter Yes. SYSGEN asks you to enter the directory to which you wish to move the files, then copies the contents of directory [1,54] to the directory you designate.

\* BE020 What directory do you want to move it to? [S R:3.-11.]:

Enter the directory to which you wish to move the system currently in [1,54]. SYSGEN creates this directory if it does not already exist and moves the files in [1,54] to the specified directory.

\* BE030 Do you want to pause to edit any files before task-building? [Y/N D:N]:

If you are doing a complete SYSGEN, you may choose to pause at this point and edit the following files:

- The Executive and driver task-build command files
- The privileged task task-build command files
- The system image initialization command file, SYSVMR.CMD

If you are doing a complete SYSGEN (that is, if you entered Yes to Question SU120), or if you are continuing a SYSGEN from some point (that is, if you entered Yes to Question SU130) SYSGEN does not give you any further opportunities to pause. After this question, SYSGEN builds the Executive and drivers, and then it proceeds to the Building the Privileged Tasks (BP) and Creating the System Image File (CS) sections. This saves you time because you do not have to wait around for SYSGEN to finish task building the Executive or the privileged tasks before you can edit SYSVMR.CMD or other files.

## BUILDING EXECUTIVE (Cont.)

If you are doing an individual section of SYSGEN, you may pause at this point and edit the Executive and driver task-build command files only.

If you want to edit any files before proceeding, enter Yes. SYSGEN pauses and allows you to invoke an editor.

### NOTE

If you are performing SYSGEN on a VAX host computer running VAX-11 RSX, you cannot use EDT to edit files; you must use EDI instead.

If your host system is RSX-11M-PLUS, enter the following command line to continue with SYSGEN after pausing:

```
>UNS AT. (RET)
```

If your host system is VAX-11 RSX, enter the following command line to continue with SYSGEN after pausing:

```
>RES (RET)
```

SYSGEN then begins building the Executive and drivers.

## BUILDING PRIVILEGED TASKS

### 3.2.6 Building the Privileged Tasks (BP)

In this section, SYSGEN task builds the privileged system tasks.

Your answers to the questions in this section are put in the saved answer file [200,200]SYSGENSA1.CMD.

The following is a description of all the possible questions in the Building the Privileged Tasks section.

\* BP010 Do you want maps for the microcode loader and requestor tasks? [Y/N D:N]:

This question appears only if you included an LPAll-K laboratory subsystem in your system by entering Yes to Question CP6204.

Enter Yes if you wish to produce task-build maps of the microcode loader and requestor tasks. However, because the maps require time to produce and usually are not needed, it is more likely that you will want to enter No.

\* BP020 Enter the microcode version desired for LPA-11 unit n [0 R:0-2 D:1]:

This question appears only if you included an LPAll-K laboratory subsystem in your system by entering Yes to Question CP6204.

The LPAll-K may be loaded with one of three versions of the microcode:

- 0 Multirequest mode
- 1 Dedicated mode A/D input
- 2 Dedicated mode D/A output

See the LPAll-K documentation for information on the versions of the microcode.

\* BP030 Is the lab I/O on this LPA-11 an AR11? [Y/N D:N]:

This question appears only if you included an LPAll-K laboratory subsystem in your system by entering Yes to Question CP6204.

The lab I/O on an LPAll-K can be handled either by K-Series/LPS-11 or AR11. If you enter No, K-Series/LPS-11 is assumed.

\* BP040 Do you want the maps of the privileged tasks? [Y/N D:N]:

Enter Yes if you wish to produce task-build maps of the privileged tasks. However, because the maps require considerable time to produce and usually are not needed, it is more likely that you will want to enter No.

\* BP050 What is to be the map device [ddu:]? [S R:2-5 D:"SY"]:

Enter the device for the privileged task map files. If the map device is a disk, the maps will be put in directory [1,34]. SYSGEN creates this directory if it does not already exist on the map device.

## BUILDING PRIVILEGED TASKS (Cont.)

\* BP060 Do you want to pause to edit any files before  
\* task-building? [Y/N D:N] :

This question appears only if you are performing an individual section of SYSGEN. If you are performing a complete SYSGEN, you must edit the privileged task task-build command files in the Building the Executive and Drivers (BE) section.

If you want to edit any of the task-build files for the privileged tasks, enter Yes. SYSGEN pauses and allows you to invoke an editor.

### NOTE

If you are performing SYSGEN on a VAX host computer running VAX-11 RSX, you cannot use EDT to edit files; you must use EDI instead.

The MCR command INS allows you to specify both the task name and the task partition as keywords. In most cases, there is no need to edit the task-build command files.

If your host system is RSX-11M-PLUS, enter the following command line to continue with SYSGEN after pausing:

>UNS AT.

If your host system is VAX-11 RSX, enter the following command line to continue with SYSGEN after pausing:

>RES

SYSGEN then begins building the privileged tasks.

## BUILDING NONPRIVILEGED TASKS

### 3.2.7 Building the Nonprivileged Tasks (BN)

This section allows you to rebuild any nonprivileged system tasks that you have patched. DIGITAL-supplied nonprivileged system tasks are prebuilt and can be found in the library directory on the target system disk. If you have not altered any of the nonprivileged tasks listed in Question BN020, you should skip over this section by entering No to Question BN010.

The nonprivileged tasks are supplied in three forms:

```

xxx.TSK      Tasks built with the FCS routines contained in their
              task images
xxxRES.TSK   Tasks built to link to the FCSRES resident library
xxxFSL.TSL   Tasks built to link to the FCSFSL supervisor-mode
              library
    
```

Which versions of the nonprivileged tasks you use with your system depend on your processor type and your answers to certain questions in the Choosing the Executive Options (CE) section of SYSGEN.

You can use the xxxFSL.TSK tasks if you have a PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, or PDP-11/84 processor and you included supervisor-mode library support (Question CE080).

You can use the xxxRES.TSK tasks on any of the supported processors if the FCSRES library is installed. SYSVMR.CMD automatically installs the FCSRES library if you entered Yes to Question CE090. Even if you entered No to CE090, you can install the FCSRES library yourself. See Chapter 4 for more information.

Note that not all of the tasks listed in Question BN020 are furnished in xxxFSL.TSK and xxxRES.TSK versions.

You can install the appropriate tasks in your system in STARTUP.CMD or SYSVMR.CMD.

The description accompanying Question BN020 lists the nonprivileged system tasks.

#### NOTE

The term "nonprivileged" is used in this section to describe those system tasks that do not link to the Executive. Some of the tasks that can be built in this section are privileged, but do not link to the Executive and therefore need not be rebuilt each time the Executive is rebuilt.

Usually you do not need to rebuild any of the nonprivileged tasks, because the distribution kit contains prebuilt copies of all the tasks listed in Question BN020.

You would need to rebuild one or more of these tasks if you applied patches to the files, or if your only copy of a task image (.TSK file type) was corrupted or accidentally deleted.

## BUILDING NONPRIVILEGED TASKS (Cont.)

Answers to the questions in this section are placed in the saved answer file [200,200]SYSGENSA3.COMD. SYSGEN allows you to include an identifying comment at the beginning of the file before asking the questions in this section.

The following is a description of all the possible questions in the Building the Nonprivileged Tasks (BN) section.

**\* BN010** Do you want to rebuild any nonprivileged tasks? [Y/N D:N]:

Enter No if you have not patched any of the nonprivileged system tasks.

Enter Yes if you have patched any of the nonprivileged system tasks (see the list in the description accompanying Question BN020).

If you enter No, SYSGEN proceeds to Question CS010.

If you enter Yes, SYSGEN proceeds to Question BN020.

**\* BN020** Enter task name(s) [S]:

This question appears only if you entered Yes to Question BN010.

Enter the names of the tasks you wish to rebuild, choosing from the following list:

BAD	DMPFSL	IOX	QMGPR
BRU	DSC	IOXRES	RPTFSL
CDA	EDI	IOXFDL	SLP
CDARES	EDIRES	LBR	SLPRES
CDAFSL	EDIFSL	LBRRES	SLPFSL
CFL	EDT	LBRFSL	STK
CFLFSL	EDTRES	MAC	STKFSL
CMP	EDTFSL	MACRES	TDX
CMPRES	FLX	MACFSL	TKB
CMPFSL	FLXRES	MFT	TKBRES
CON	FLXFSL	PAT	TKBFSL
CRF	FMT	PATRES	VFY
CRFRES	FTB	PATFSL	VFYRES
CRFFSL	FTBRES	PIP	VFYFSL
DCL	FTBFSL	PIPRES	ZAP
DLD	ICM	PIPFSL	ZAPRES
DMP	ICMRES	QMGCLI	ZAPFSL
DMPRES	ICMFSL	RPT	

Enter "ALL" to build all the non-FCSRES and non-FCSFSL tasks. Enter "ALLRES" to build all the FCSRES tasks. Enter "ALLFSL" to build all the FCSFSL tasks.

You can enter the task names separated by commas and on more than one line. When you are done, finish the list with a period or press RETURN in response to the prompt.

## BUILDING NONPRIVILEGED TASKS (Cont.)

\* BN024 What is the library UFD of the target system? [S R:3.-11. D:"[3,54]"]:

This question appears only if you choose to rebuild any of the nonprivileged tasks in Question BN010.

Enter the library directory for the target system. SYSGEN puts the nonprivileged tasks that you rebuild in the directory you choose in this question. The nonprivileged system tasks are normally kept in the system's library directory.

If you are performing a complete SYSGEN, this directory is normally [3,54], and you should take the default. If you are performing this section of SYSGEN on an already-generated system to rebuild nonprivileged tasks that you have altered, enter the library directory of the current system.

\* BN030 Do you want the maps of the nonprivileged tasks? [Y/N D:N]:

This question appears only if you chose to rebuild any of the nonprivileged tasks in Question BN010.

Enter Yes if you wish to produce task-build maps of the nonprivileged tasks. Because the maps require considerable time to produce and usually are not needed, you should enter No.

\* BN040 What is to be the map device [ddu:]? [S R:2-5 D:"SY:"]:

This question appears only if you chose to rebuild any of the nonprivileged tasks in Question BN010.

Enter the device on which you want to put the nonprivileged task map files. If the map device is a disk, the maps are put in directory [1,34]. SYSGEN creates this directory if it does not already exist on the map device.

\* BN050 Do you want to pause to edit any files before task-building? [Y/N D:N]:

This question appears only if you chose to rebuild any of the nonprivileged tasks in Question BN010.

Enter Yes to pause. Enter No to begin building the nonprivileged tasks you specified.

### NOTE

If you are performing SYSGEN on a VAX host computer running VAX-11 RSX, you cannot use EDT to edit files; you must use EDI instead.

## BUILDING NONPRIVILEGED TASKS (Cont.)

If your host system is RSX-11M-PLUS, enter the following command line to continue with SYSGEN after pausing:

>UNS AT.

If your host system is VAX-11 RSX, enter the following command line to continue with SYSGEN after pausing:

>RES

SYSGEN then begins building nonprivileged tasks.

## CREATING SYSTEM IMAGE FILE

### 3.2.8 Creating the System Image File (CS)

In this section, SYSGEN creates and initializes the system image file. A VMR indirect command file named SYSVMR.COMD creates the partitions, loads the drivers, and installs the privileged tasks in the system image file.

Your answers to the questions in this section are put in the saved answer file [200,200]SYSGENSA1.COMD.

The following is a description of all the possible questions in the Creating the System Image File section.

\* CS010 Do you want to pause to edit SYSVMR before creating  
\* the system image file? [Y/N D:N]:

This question appears only if you are performing an individual section of SYSGEN. If you are performing a complete SYSGEN, you must edit SYSVMR in the Building the Executive and Drivers section.

SYSGEN creates a VMR indirect command file, [1,54]SYSVMR.COMD, that is used with VMR to initialize your system image file. The commands in the command file set up primary and secondary pool, create partitions, load the loadable drivers, set the size of the terminal driver's buffer space, install all the privileged tasks, set the system tuning parameters, and set the default terminal characteristics.

You may want to tailor this command file for your system. For example, SYSGEN creates secondary pool with 16K words. If you have a large number of terminals or plan a very large number of simultaneously open files, this amount of space may be too small. If you have a smaller system with few terminals and open files, this amount of space may be too large.

Usually, you would want to edit SYSVMR to do the following:

- Change which tasks are installed
- Change the size of secondary pool
- Adjust the size of the terminal driver's buffer space
- Change the terminal characteristics

If you enter Yes, SYSGEN pauses and allows you to invoke an editor and edit SYSVMR.COMD.

#### NOTE

If you are performing SYSGEN on a VAX host computer running VAX-11 RSX, you cannot use EDT to edit files; you must use EDI instead.

If your host system is RSX-11M-PLUS, enter the following command line to continue with SYSGEN after pausing:

>UNS AT. (RET)

## CREATING SYSTEM IMAGE FILE (Cont.)

If your host system is VAX-11 RSX, enter the following command line to continue with SYSGEN after pausing:

```
>RES (RET)
```

If you enter No, SYSGEN immediately continues.

When SYSGEN continues, it creates the system image file and initializes it using the SYSVMR command file. SYSGEN accomplishes these tasks using the following command sequence:

```
>SET /UIC= [1,54]
>PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK
>ASN SY:=LB:
>VMR @SYSVMR
```

VMR always prints the following diagnostic messages as it initializes the system image file using SYSVMR:

```
VMR -- *DIAG*-Installed      tasks or commons may no longer fit in partition
SET /TOP=SYSPAR:--*
VMR -- *DIAG*-Loadable driver larger than 4K
LOA TT:
VMR -- *DIAG*-Installed tasks or commons may no longer fit in partition
SET /TOP=DRVPAR:--*
```

These messages do not indicate errors in your system.

When this section completes, SYSGEN is finished, and exits. If you were performing a PREPGEN, invoke SYSGEN again and specify the saved answer files that the PREPGEN just created as input. If you were performing a SYSGEN, you now have a system image ready for bootstrapping. Proceed to Chapter 4 for information on bootstrapping and saving the new system.

## CHAPTER 4

### AFTER SYSGEN

After SYSGEN exits, there are several steps remaining that must be performed before you have a working system. This chapter describes those steps and provides other information that will help you set up and run your system.

#### 4.1 BOOTSTRAPPING AND SAVING THE UNSAVED SYSTEM

If you have finished performing SYSGEN as detailed in Chapter 3, your target system disk contains a bootstrappable, unsaved RSX-11M-PLUS system image.

To bootstrap the unsaved system and to save the system image, complete the following steps:

1. If the target system disk is not already spinning in a drive, load the disk and mount it. For example, if your target system disk is DB0:, use the following command line:

```
>MOU DB0:RSX11MPBL24 (RET)
```

2. Software bootstrap the unsaved system in directory [1,54] on your target disk. Note that this step should not be performed on an on-line system unless you are the only user logged on, because software bootstrapping the target system stops the host system.

For example, if your target system disk is DB0:, use the following command line:

```
>BOO DB0:[1,54] (RET)
```

The BOO command brings the unsaved system into memory, where the initialization module INITL initializes it. If INITL encounters an error condition, it prints an error message. For more information on system initialization errors and error messages, see Section 4.9.

3. If you have included XDT in your system, a prompt from XDT appears on your terminal. In response to the prompt, type "G" (without pressing RETURN). The system begins executing and prints an identification message. For example:

```
XDT: 24
```

```
XDT>G  
RSX-11M-PLUS V3.0 BL24
```

## AFTER SYSGEN

If you did not include XDT in your system, the system begins running immediately and prints the version and base level identification message.

4. Enter the current time and date. For example:

```
>TIM 09:42 13-JUN-85 (RET)
```

5. To verify that your system is working, enter a TIM command. If the system responds, it indicates that the system works properly. For example:

```
>TIM (RET)
09:42:03 13-JUN-85
```

6. Save the system image, using the SAV command without any switches. For example:

```
>SAV (RET)
```

### CAUTION

Do not use the /WB switch with the SAV command before you have determined that the system can be saved properly. If you use the /WB switch to rewrite the bootblock and saving the system causes the system image to be corrupted, you will not be able to hardware bootstrap either the baseline system or your system. You will be able to recover access to your generated system only by using a running RSX-11M-PLUS system to software bootstrap your generated system.

The SAV command writes the system image back to the target disk, reads the saved image back into memory, and brings up the system using the startup command file, [1,2]STARTUP.CMD.

7. When STARTUP.CMD prompts you for the time and date, press CTRL/Z to exit from the startup command file.
8. If the system appears to be working correctly and there were no error messages printed after you used the SAV command, save the system again, this time rewriting the bootblock with the /WB switch. The system begins executing and prints an identification message. For example:

```
>SAV /WB (RET)
DMO -- SYSTEM dismounted from DB0:      *** Final dismount initiated ***
RSX-11M-PLUS V3.0 BL24 576.K System:"JCFROG"
```

The /WB switch causes the SAV command to alter the bootblock pointer on your target disk. The next time the target disk is hardware bootstrapped, your new system will come up instead of the baseline system.

For information on the SAV command that may help you determine the source of any difficulties in saving your system, see the description of the SAV command in the RSX-11M/M-PLUS MCR Operations Manual. For more information on the DIGITAL-supplied startup command file, see Section 4.4.1.

## 4.2 BACKING UP THE SAVED SYSTEM

As soon as you have saved your system, you should make a backup copy to guard against accidental corruption of the target disk contents. You can use the Backup and Restore Utility (BRU) to make hardware-bootstrappable copies of your system disk. If you have more than one disk drive available, you can use BRU on line to copy disk-to-disk. If you have only one disk drive available, you can use the BRUSYS system to copy disk-to-tape and then tape-to-disk. (For information on backing up RL02 pregenerated systems, see Chapter 5.) If you do not want to use a disk, you should back up your new system to magnetic tape; you can restore the system to disk should the need arise.

For more information on copying system images using BRU, see Chapter 7 of the RSX-11M/M-PLUS Utilities Manual. For information on valid bootstrappable devices under RSX-11M-PLUS, see Chapter 3 of the RSX-11M/M-PLUS MCR Operations Manual.

## 4.3 RECOVERING DISK SPACE AFTER A SYSTEM GENERATION

Most of the files on the RSX-11M-PLUS distribution kit are used only for system generation or for user reference. Once you have completed a SYSGEN, you can delete these files from your system disk. Doing so results in a considerable saving of disk space.

The only files that must be present on the running system disk are the following:

- All files in the Master File Directory (the directory [0,0])
- All files in the [1,\*] directories
- All files in the library directory (normally, [3,54])
- All files in the system directory (normally, [1,54])

Copying your target disk to another disk using BRU reorganizes the files and provides the largest possible contiguous space.

## 4.4 OTHER SYSTEM SETUP INFORMATION

The following sections describe various tasks the system manager should perform to prepare a newly generated system for general use.

### 4.4.1 The Startup Command File

Each time the system is bootstrapped, the file named [1,2]STARTUP.CMD is invoked. The prototype startup file provided on your system performs various functions that may or may not be appropriate for your system, depending on the Executive options you chose during SYSGEN. You should tailor this file now to your particular system needs.

The following are functions commonly performed at system startup:

- The system-controlled checkpoint space is allocated.
- All devices configured into the system are brought on line.

## AFTER SYSGEN

- The Console Logger is started.
- The system Error Logging is started.
- The DIGITAL Command Language (DCL) and any user-supplied CLIs are initialized.
- Resource Accounting is started.
- The Queue Manager and batch processor is started.
- The speed and type of terminals are set.
- Resident libraries, utilities, system and user tasks are installed.

Certain system privileged and nonprivileged tasks are installed by [1,54]SYSVMR.COMD when you create the system image file using SYSGEN. You will probably want to install additional system and user tasks in your system, or to alter terminal characteristics if they have changed since you performed SYSGEN. You may do this in two different ways.

First, you can install tasks or change terminal characteristics in the system image using VMR. By using VMR, the tasks will be installed as soon as the system is bootstrapped. You can either use VMR commands directly, or you can run the Creating the System Image (CS) section of SYSGEN again and edit the SYSVMR.COMD file to suit your needs. You should use VMR if it is most important that the system is ready for use as soon as it is bootstrapped.

Second, you can install tasks or change certain terminal characteristics using MCR commands in the STARTUP.COMD file. You can use the features of the Indirect Command Processor to install tasks or perform other system initialization duties conditionally. If you have not edited the SYSVMR.COMD file, the STARTUP.COMD file can serve as a record of the changes and additions you have made to the "standard" system.

### 4.4.2 Installing the RMS-11 Tasks, Utilities, and Libraries

RMS-11 Version 2.0 is included on the RSX-11M-PLUS distribution kit and is therefore already on your target system disk. To use RMS-11, you need only install the resident libraries and RMS-11 utilities.

To make installation easier, the prototype STARTUP.COMD file supplied on the distribution kit contains all the necessary installation commands. If you wish to use RMS-11, activate these commands by editing [1,2]STARTUP.COMD to remove the periods and semicolons from the beginning of each command line you wish to use.

For more information on installing RMS-11, see the RSX-11M-PLUS Release Notes. See RMS-11: An Introduction for information on using RMS-11.

### 4.4.3 Login and Batch Job Message Files

When you log in, the system prints the login information file [1,2]LOGIN.TXT on your terminal. You should edit this file to provide installation news and notices to system users. See the description of the HEL/LOG command in the RSX-11M/M-PLUS MCR Operations Manual for details on LOGIN.TXT.

## AFTER SYSGEN

If you have included batch processor support in your system, you should edit [1,2]BATCH.TXT, which is included at the beginning of each batch job log.

### 4.4.4 The Account File

If you have a previously created account file, copy the account file to the new system disk. If you do not already have an account file, run the Account File Maintenance Program (ACNT) to create an account file and user accounts. See the RSX-11M/M-PLUS System Management Guide for information on using ACNT.

The account file supplied on the distribution kit contains two accounts, one privileged and one nonprivileged:

```
UIC:           [1,1]
Account name:  SYSTEM
Password:      SYSTEM
```

```
UIC:           [200,1]
Account name:  USER
Password:      USER
```

To preserve the security of your system, you should change the passwords to these accounts as the first step in setting up an account file.

All new passwords in the account file are encrypted automatically; that is, the operating system uses an algorithm to scramble the passwords so that only the system is able to read them. If you are copying an account file from a previous version of RSX-11M-PLUS to this version, you can encrypt the passwords by either changing the passwords in the account file or by having the system users issue the MCR command SET /PASSWORD (or DCL command SET PASSWORD) to change them. For more information on password encryption, see the RSX-11M/M-PLUS System Management Guide.

The [200,1] account and the directory [USER], which contains several introductory files, are supplied for use in conjunction with the warm-up session for new users presented in the Introduction to RSX-11M-PLUS. New users coming onto the system can use the account with the UIC [200,1] that has been provided in the account file supplied with your distribution kit and the directory [USER] to follow along with the warm-up session.

The directory [USER] also contains two sample device drivers and their associated data bases that you or system programmers may find interesting (XXDRV.MAC, XXTAB.MAC, BMDRV.MAC, BMTAB.MAC).

### 4.4.5 Help Files

Short-form information on the use of many RSX-11M-PLUS commands, utilities, and features is available on line through the HELP command. You can add help files to provide users with installation-specific information.

The HELP files supplied with your system are located in directory [1,2] on your target system disk. See the RSX-11M/M-PLUS MCR Operations Manual for a description of the HELP command and the help file format.

#### 4.4.6 Installing and Using System Tasks

Many privileged and nonprivileged system tasks are installed in your system image by [1,54]SYSVMR.COMD when you create the system image file using SYSGEN. You can install other system tasks that you may wish to use by editing the STARTUP.COMD file or the SYSVMR.COMD file as described in Section 4.4.1 or by installing the tasks yourself by using the MCR command INS.

Many of the nonprivileged system tasks are supplied in xxxFSL.TSK and xxxRES.TSK versions. If you have chosen supervisor-mode library support in Question CE080, you should use the xxxFSL.TSK tasks that are supplied.

If you have not chosen supervisor-mode library support, you can use the xxxRES.TSK tasks. If you chose to build the privileged system tasks to link to FCSRES by entering Yes to Question CE090, you can use the xxxRES.TSK tasks simply by installing those you need.

You can use the xxxRES.TSK tasks even if you entered No to Question CE090. You need only install the FCSRES library, using the following MCR command line:

```
>INS [1,1]FCSRES.TSK/PAR=GEN/RON=YES (RET)
```

You can then install and use any of the xxxRES.TSK nonprivileged system tasks.

#### 4.5 INSTALLING LAYERED PRODUCTS

If you intend to include any DIGITAL layered products in your system, see the appropriate layered product installation documentation for specific instructions.

#### 4.6 FINDING OUT MORE ABOUT THE SYSTEM

If you are not already familiar with RSX-11M-PLUS, you should read the Introduction to RSX-11M-PLUS and perform the on-line terminal session.

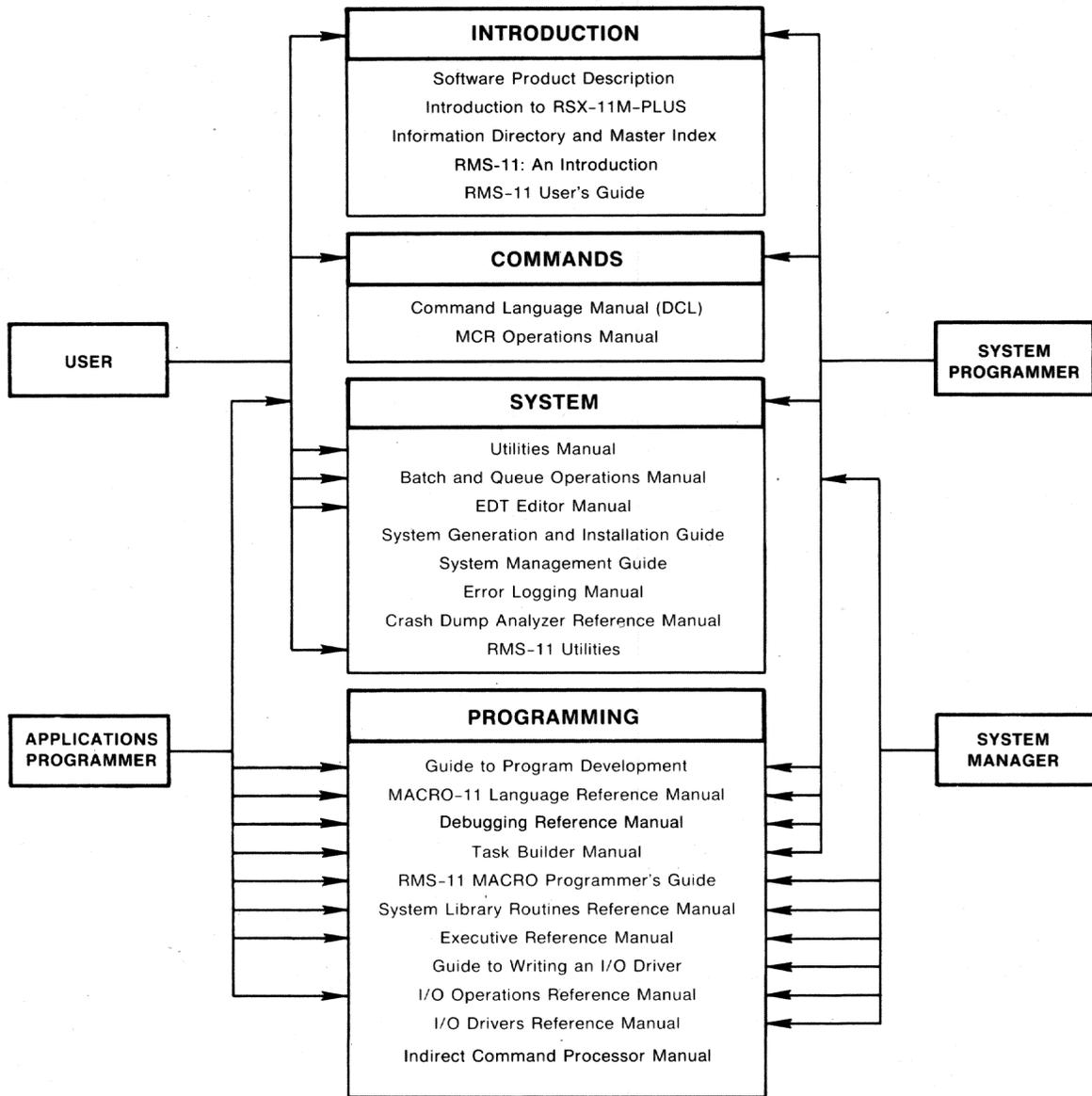
If you are to be the manager of an RSX-11M-PLUS system, you should read the RSX-11M/M-PLUS System Management Guide to become familiar with the system management utilities you will need to use.

The quickest way to find information on a specific subject is to use the Master Index contained in the RSX-11M-PLUS Information Directory and Master Index. The Master Index consists of all the individual manual indexes merged into a comprehensive reference to the entire documentation set.

Figure 4-1 groups the manuals in the RSX-11M-PLUS documentation set in two ways to help you learn where to find the information you need:

<b>By subject area</b>	Introduction to RSX-11M-PLUS Command Interfaces System Structure and Operation Applications and System Programming
<b>By user area</b>	User Level Interfacing With the System Applications Programming System Programming Managing System Resources

**AFTER SYSGEN**



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Figure 4-1 Organization of the Documentation by Subject and by Function

**4.7 CHANGING THE SYSTEM WITHOUT REPEATING SYSGEN**

You must perform a new system generation if you wish to choose different Executive options or to alter the peripheral configuration for devices that have resident data bases. You can use saved answer files for those sections you do not wish to alter, thus reducing the number of questions you must answer.

## AFTER SYSGEN

Many system parameters and characteristics, however, can be changed without performing a complete system generation. The following is a list of some of the changes you can make:

- You can alter the system parameters and terminal characteristics in SYSVMR.CMD.
- You can change device CSR and vector addresses using the VMR or MCR command CON SET.
- You can change the device configuration for devices that were generated with loadable data bases.
- You can add loadable drivers for devices not included during system generation.
- You can rebuild any of the nonprivileged tasks.

### 4.7.1 Altering System Parameters Using VMR

The following system parameters are set and functions performed in the SYSVMR.CMD file:

- Secondary pool size is set.
- Partitions are created.
- The directive commons are installed.
- The size of the terminal data space buffers (TTCOM) are set.
- The drivers are loaded.
- Privileged and nonprivileged tasks are installed.
- The round-robin scheduling interval and priority range are set.
- The Executive-level disk swapping interval and priority range are set.
- Pool limit parameters are set for the Pool Monitor Task (PMT).
- Terminal line speed, buffer size, terminal type, and other characteristics are set.

To alter system parameters using VMR, edit [1,54]SYSVMR.CMD where necessary, and then recreate the system image file. For example:

```
>SET /UIC=[1,54] (RET)
>PIP RSX11M.SYS/NV/CO/BL:1026.=RSX11M.TSK (RET)
>ASN SY:=LB: (RET)
>VMR @SYSVMR (RET)
```

When VMR exits, bootstrap and save the system, as described in Section 4.1.

### 4.7.2 Adding Devices

If you change your hardware configuration or obtain new devices, you may be able to make the corresponding changes to your RSX-11M-PLUS system without repeating SYSGEN.

## AFTER SYSGEN

If you are adding a device type that does not exist in your current system, invoke SYSGEN and choose the Adding a Device (AD) section. This section creates a loadable data base and assembles and builds the driver for the new device. You must recreate your system image file and load the new driver and data base.

If you are changing the configuration for a device type that already exists in your current system (for example, you have three DB-type devices generated into your system and want to have five, or you want to change which devices are on which controller), and the device driver was originally generated with a loadable data base, perform the Adding a Device (AD) section of SYSGEN to create a new loadable data base and reassemble and rebuild the driver. You must then re-create your system image file and load the driver and the new data base.

There are some restrictions on adding devices without performing a complete SYSGEN. See Section 4.7.2.1.

To add a device or change a device's configuration, invoke SYSGEN and enter No to the following questions:

- \* SU120 Do you want to do a complete SYSGEN?
- \* SU130 Do you want to continue a previous SYSGEN from  
\* some point?

When SYSGEN asks which individual section of SYSGEN you wish to perform, choose the Adding a Device (AD) section. (You cannot use a saved answer file when you are performing this section of SYSGEN.) SYSGEN then asks you all the questions in the Choosing Peripheral Configuration (CP) section.

Specify the number of controllers or devices only for the device type that you are adding or changing; specify zero controllers or devices for all the others. For MASSBUS devices (device mnemonics DB, DR, DS, EM, and MM), specify the full number of RH controllers that you have, but do not specify any MASSBUS devices that you are not adding or changing.

When all the questions in the Choosing Peripheral Configuration (CP) section have been asked, SYSGEN assembles and task builds the driver and data base for the device you specified.

When SYSGEN exits, edit [1,54]SYSVMR.COM to add the LOA command to load the new driver and data base in your system. If you are adding or changing a MASSBUS device (device mnemonics DB, DR, DS, EM, or MM) or an RK06 or RK07 (device mnemonic DM), you must use the /CTB switch with the LOA command:

```
LOA dd:/CTB=cca
```

where:

- dd: is the device mnemonic (for example, DB:, DM:)
- cc is the controller mnemonic (RH for MASSBUS devices, DM for RK06 or RK07 disks)
- a is the controller letter (or letters separated by commas) of the controllers to which the device is connected

## AFTER SYSGEN

Create a new system image file containing the new driver and data base. For example:

```
>SET /UIC= [1,54] (RET)
>PIP RSX11M.SYS/NV/CO/BL:1026.=RSX11M.TSK (RET)
>ASN SY:=LB: (RET)
>VMR @SYSVMR (RET)
```

When VMR exits, bootstrap and save the system, as described in Section 4.1.

**4.7.2.1 Restrictions on Adding Devices after SYSGEN** - There are some restrictions on which devices you may add after SYSGEN. Choices you made during SYSGEN may also affect your ability to add new devices.

If a device has a resident data base, it cannot be added or changed after SYSGEN. The following devices always have resident data bases:

```
TT: All terminals
LA: LPA11-K laboratory peripheral accelerator
```

If you have generated a mixed MASSBUS configuration, all the MASSBUS devices (device mnemonics DB, DR, DS, EM, and MM) have resident data bases, and additions or changes cannot be made without performing a complete SYSGEN.

If you did not generate any MASSBUS devices into your system, you cannot add any MASSBUS devices after SYSGEN. If you generated at least one MASSBUS device into your system, you can change that device or add any of the other MASSBUS devices after SYSGEN.

If you did not generate any RK06s or RK07s (device mnemonic DM) into your system, you cannot add that device type after SYSGEN.

Another restriction is that you cannot add any device with a vector address that is higher than the highest interrupt vector address you specified. For this reason, you should always specify a highest interrupt vector address of 774(octal) at the end of the Choosing Peripheral Configuration (CP) section, in case you want to add devices later.

### 4.7.3 Rebuilding Nonprivileged Tasks

You can rebuild nonprivileged tasks at any time by invoking SYSGEN and selecting the Building the Nonprivileged Tasks (BN) section. See Chapter 3 for a description of the questions asked in this section.

## 4.8 PUTTING MORE THAN ONE SYSTEM ON THE SAME VOLUME

There may be instances in which you wish to put two or more RSX-11M-PLUS systems on a single disk volume. Each system might contain different hardware configurations or different software components and features.

If you wish to place two or more RSX-11M-PLUS systems on a single disk volume, you must take certain precautions to avoid possible conflicts or confusion. Each system must have in its system directory separate copies of the system image file and all privileged task files. The nonprivileged task files in the library directory can be shared by both systems, as can the system libraries in directory [1,1].

## AFTER SYSGEN

### NOTE

The following procedure for putting two RSX-11M-PLUS systems on a single disk volume assumes that both the systems are RSX-11M-PLUS Version 3.0 systems. You may encounter various software incompatibilities if you attempt to put RSX-11M-PLUS systems of dissimilar versions on the same disk volume.

To add an RSX-11M-PLUS system to a volume that already contains an RSX-11M-PLUS system, use the following procedure. (Note that the system already on the volume is referred to as the first system, and the system you are adding is referred to as the second system. The volume designated SY: contains the first system and will later contain the second one as well. The volume designated DB1: contains the second system. Both SY: and DB1: are assumed to be already mounted.)

1. Create a separate directory on the volume, such as [4,54], for the second system. Set your default UIC to this directory. For example:

```
>UFD SY:[4,54] (RET)
>SET /UIC=[4,54] (RET)
```

2. Copy all files from directory [1,54] of the disk that contains the second system to the directory you created in step 1. For example:

```
>PIP SY:[4,54]/CD=DB1:[1,54]*.* (RET)
```

3. Delete the second system's RSX11M.SYS file. For example:

```
>PIP RSX11M.SYS;*/DE (RET)
```

4. Create a file named RSX11M.SYS from the second system's RSX11M.TSK file. For example:

```
>PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK (RET)
```

5. Use the second system's SYSVMR file and VMR to set up partitions, install tasks, and load drivers. For example:

```
>ASN SY:=LB: (RET)
>VMR @SYSVMR (RET)
```

6. Software bootstrap the second system, using the BOO command.

```
>BOO (RET)
```

7. For the install-run-remove option of the RUN command to work properly, you must set the proper default system UIC. Use the SET /SYSUIC command to set the system UIC to the UIC to which you copied the second system. For example:

```
>SET /SYSUIC=[4,54] (RET)
```

8. Set the library UIC to the library UIC of the first system. For example:

```
>SET /LIBUIC=[3,54] (RET)
```

## AFTER SYSGEN

9. Save the second system with the SAV command. Use the /WB switch only if you wish to have the second system be the one that comes up when you hardware bootstrap the volume. Note that only one system on a volume can be hardware-bootstrappable.

```
>SAV (RET)
```

The volume now contains two systems.

The following is an example of adding a second system (on DB1:) to an existing system (on the system device):

```
>UFD SY:[4,54] (RET)
>SET /UIC=[4,54] (RET)
>PIP SY:[4,54]/CD=DB1:[1,54]*.* (RET)
>PIP RSX11M.SYS;*/DE (RET)
>PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK (RET)
>ASN SY:=LB: (RET)
>VMR @SYSVMR (RET)
```

```
. [Messages from VMR appear here]
.
```

```
>BOO (RET)
```

```
RSX-11M-PLUS V3.0 BL24
```

```
>SET /SYSUIC=[4,54] (RET)
>SET /LIBUIC=[3,54] (RET)
>SAV (RET)
```

```
RSX-11M-PLUS V3.0 BL24      576.K System:"NANCY"
```

If you install a task in a system other than the current system, and then run the task in the current system, the task aborts with the following message:

```
Task installed in more than one system
```

When you install a task, system-specific information is written into its header in the task image file. When you run an installed task, the loader checks the header information to verify that it matches the system from which the RUN command was issued. If this information does not match, the load operation fails and the task is aborted.

You can avoid this problem by removing the task from the current system and reinstalling it in the current system, thereby making the current system the system in which the task has been installed most recently.

### 4.9 SYSTEM INITIALIZATION ERRORS

When an unsaved system is bootstrapped, the system initialization module INITL establishes data structures and performs sanity checks on the system. If INITL encounters an error condition, it prints an error message on the system console terminal. The state of the system depends on whether XDT is present and whether the error condition is classified as WARNING or FATAL.

## AFTER SYSGEN

If your system does not have XDT, INITL halts the processor. Either of two error messages appears:

- If the message is labeled "Warning," you can proceed with system initialization by pressing the CONT switch on the processor console panel.
- If the message is labeled "Fatal," you cannot continue system initialization but must fix the problem and rebootstrap the disk.

If the system includes XDT, INITL executes a breakpoint trap (BPT) instruction, which causes control to pass to XDT. XDT prints a breakpoint error (BE:) message and prompts you for input.

- If the message is labeled "Warning," you can use XDT commands to examine locations and correct the problem. Type the P command to continue system initialization.
- If the message is labeled "Fatal," you cannot continue with system initialization but must fix the problem and rebootstrap the system.

### 4.9.1 System Initialization Warning Messages

The following are the possible INITL warning messages:

Warning -- Crash device not found in system tables:

R0=device type (ASCII)

R1=logical unit number

Enter CSR address in R2, physical unit number in R1  
type P

and

hit continue

**Explanation:** The device that you specified for crash dumps does not have an associated Device Control Block (DCB) in the system device tables.

**User Action:** INITL allows you to enter the CSR of the crash dump device so that you can continue system operation without having to rebuild the Executive.

Warning -- Device xx Vector address above V\$\$CTR

**Explanation:** In examining the vector assignments, INITL finds that the vector address for this device is higher than the highest possible address for vectors on this system.

**User Action:** You can use the VMR command CON SET to change the value S.VCT/K.VCT in the device data base. See the RSX-11M/M-PLUS System Management Guide for a description of the VMR command CON SET.

Warning -- Device xx Vector in use

**Explanation:** INITL finds that the vector for device xx points to something other than an Executive nonsense interrupt entry point.

**User Action:** Either the vector itself has been corrupted (use XDT or ZAP to correct this) or the vector has been incorrectly specified (use the VMR command CON SET to correct this).



## AFTER SYSGEN

Driver error -- If the driver is a DIGITAL-supplied driver, submit an SPR to DIGITAL.

**Explanation:** The system image is corrupted or there is an error in the driver.

**User Action:** If the system image is corrupted, perform SYSGEN again, using the saved answer files previously produced. If the driver is the problem, submit a Software Performance Report (SPR) to DIGITAL.

Fatal error -- Executive data space not loaded

**Explanation:** You have not used VMR to create the system image file.

**User Action:** Perform the Creating the System Image File (CS) section of SYSGEN to create the system image file.

Fatal error -- Secondary pool not created with VMR

**Explanation:** You have not created a secondary pool partition in your system image file.

**User Action:** Use the VMR command SET to create a secondary pool partition.



## CHAPTER 5

### PREGENERATED RSX-11M-PLUS KITS

The pregenerated RSX-11M-PLUS kit provides the quickest and easiest way to begin running an RSX-11M-PLUS system on your PDP-11 hardware.

The other RSX-11M-PLUS distribution kits require you to spend a considerable time generating an RSX-11M-PLUS system that suits your hardware and programming needs. The pregenerated kit, however, contains a ready-to-run RSX-11M-PLUS system that is suitable for many hardware configurations, especially those that do not have large-capacity disk drives and many peripheral devices.

You need perform only a few simple operations before you are ready to begin using your pregenerated system. The sections in this chapter guide you through those operations step by step.

Section 5.1 briefly describes the pregenerated kits and the systems they contain. Section 5.2 then explains the steps necessary to install the pregenerated kit on your hardware system, and Section 5.3 gives an example of one of those steps, copying the system. Section 5.4 tells you how to tailor various system files to suit your needs, and describes other tasks related to preparing the system for use. Section 5.5 provides detailed descriptions of the features and restrictions of the pregenerated system. Finally, Section 5.6 describes various methods of changing certain aspects of your system, such as adding device drivers, supporting laboratory I/O peripherals, or including DECnet.

You should read through this chapter and familiarize yourself with the pregenerated kit and the operations you must perform before you attempt to do anything with your kit disk.

#### 5.1 SHORT DESCRIPTIONS OF THE KIT AND THE SYSTEM

The following sections describe briefly the contents of the pregenerated kit and the features of the RSX-11M-PLUS systems the kit contains. A detailed description of the features, characteristics, and limitations of the pregenerated systems is given in Section 5.5.2.

##### 5.1.1 Description of the Pregenerated Distribution Kits

The pregenerated distribution kit consists of one RL02 disk. The kit disk contains all the necessary RSX-11M-PLUS system files and utilities, and RMS-11 Version 2.0 files and utilities, as well as some special-purpose files. The disk also contains two ready-to-run system images.

### 5.1.2 Description of the Pregenerated RSX-11M-PLUS System

The pregenerated system is an RSX-11M-PLUS image that incorporates most RSX-11M-PLUS features. When you bootstrap the disk, an automatic system startup procedure identifies the peripheral devices connected to your processor and performs various other housekeeping tasks. Once the startup procedure is finished, you can begin using your RSX-11M-PLUS system immediately.

For the automatic system startup procedure to be able to properly identify the peripheral devices connected to your processor, those devices must be at DIGITAL-standard CSR and vector addresses. If you have a PDP-11/23-PLUS, PDP-11/24, or one of the MicroPDP-11 series packaged systems, your devices are probably at the standard CSR and vector addresses. If you are not sure about whether your system is configured properly, consult DIGITAL Field Service.

Two pregenerated system images are provided on the kit disk, one for use on processors that support separate instruction- and data-space mapping (such as the PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, and PDP-11/84), the other for use on processors that do not (such as the PDP-11/23-PLUS, PDP-11/24, and MicroPDP-11/23).

See Section 5.5.2 for detailed descriptions of the Executive features and devices supported.

## 5.2 INSTALLING THE PREGENERATED SYSTEM

Before you do anything else with your pregenerated system, you must perform the following operations:

- Copy the DIGITAL-supplied distribution kit disk to a blank disk.
- Delete unnecessary files to provide more free space on the system disk.

The following sections help you decide how to perform the operations, and guide you step by step through the process of installing your system.

### 5.2.1 Copying the DIGITAL-Supplied Kit Disk

You must make a copy of the kit disk that you received from DIGITAL. You should do this before you alter the kit disk in any way. You will then be able to save the DIGITAL-supplied disk as a backup, in case something goes wrong and your system disk is damaged or corrupted, or in case your needs change and you have to set up your system differently. The procedures described in the following sections require you to delete files from the system disk; if you use the DIGITAL-supplied disk as your system disk, you will destroy your only master copy of the RSX-11M-PLUS software.

The copying procedure you use depends on your hardware configuration:

- If you have a small system with two RL02 drives, you can copy the kit to a blank RL02 disk.
- If you have a MicroPDP-11 processor, you might wish to copy the kit to the fixed disk.

## PREGENERATED RSX-11M-PLUS KITS

If you wish to copy the DIGITAL-supplied RL02 kit disk to another RL02 disk, turn to Section 5.2.2.

If you wish to copy the RL02 kit disk to an RD51, RD52, or other disk, turn to Section 5.2.3.

### 5.2.2 Copying the RL02 Kit Disk to a Blank RL02 Disk

This section describes how to copy an RL02 kit disk to another RL02 disk, using the BRUSYS system supplied on the kit disk. It also describes the procedure for deleting unused system files to increase available space on the system disk.

You need one blank RL02 disk to make a copy of the RL02 kit disk.

Section 5.3 contains an example of the copying and deleting procedures. You might find it helpful to remove those pages from the binder and refer to the example as you read through the following instructions.

Use the following procedure to copy the kit disk. (The output disk referred to in this section is the blank RL02 disk to which you are copying the kit disk.)

1. Place the kit disk and the output disk in their respective drives. If you are not familiar with the procedure for using RL02 disk drives, consult the hardware documentation for the RL02 drive.
2. Hardware bootstrap the kit disk. (Consult DIGITAL Field Service or your processor documentation for information on hardware bootstrapping devices.) This brings the pregenerated system into memory. The system startup procedure is invoked automatically and prompts you for the date and time. Press CTRL/C in response to the prompt. Then type ABO AT. in response to the MCR prompt to abort Indirect and exit from the startup procedure.

The following is an example of bootstrapping a kit disk mounted in drive DL0: on a PDP-11/23-PLUS processor:

```
TESTING MEMORY
0512. KW
START? DL (RET)
```

```
RSX-11M-PLUS V3.0  BL24  512.KW  System: "RL02SY"
>RED DL:=SY:
>RED DL:=LB:
>RED DL:=SP:
>MOU DL:"PREGENNEDSYS"
>@DL:[1,2]STARTUP
```

RSX-11M-PLUS system startup procedure

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Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.). After entering the time and date press the return key.  
Example: 13:55 30-MAR-85

## PREGENERATED RSX-11M-PLUS KITS

Time and date : **CTRL C**  
MCR>ABO AT. **RET**

12:00:47 Task "AT.T0 " terminated  
Aborted via directive or CLI

If you cannot bootstrap your system, check your system's site configuration documentation or consult DIGITAL Field Service to see whether your hardware has the standard CSR and vector addresses for the RL02 drive controller. The CSR address must be 174400 (octal) and the vector 160 (octal) .

3. Write-protect the kit disk, using the write-protect switch on the drive. Software bootstrap the BRUSYS stand-alone system, using the following command line:

>BOO [6,54]BRUSYS **RET**

This brings the BRUSYS system into memory. The BRUSYS system prints an identification line on the console terminal, and then runs the Stand-Alone Configuration and Disk Sizing Program (CNF).

4. Enter the device specifications in response to the prompts from CNF. The "first device" is the drive containing the kit disk; the "second device" is the drive containing the output disk. For example:

Enter first device: DL0: **RET**

Enter second device: DL1: **RET**

5. Press the RETURN key, then enter the date and time using the TIM command. Use the TIM command again to verify that you entered the correct date and time. For example:

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY' **RET**

>TIM 11:45 02/01/85 **RET**

>TIM **RET**

11:45:01 1-FEB-85

6. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output device is DL1:, use the following command sequence:

>RUN BAD **RET**

BAD> DL1:/LIST **RET**

BAD -- DL1: Total bad blocks= 0.

BAD > **CTRL Z**

If BAD finds bad blocks on your output disk, the blocks will be marked on the disk and will not be used again by RSX-11M-PLUS. If your output disk has a large number of bad blocks (for example, more than 10), or if block 0 is bad, you should use another disk.

## PREGENERATED RSX-11M-PLUS KITS

7. Run the Backup and Restore Utility (BRU) to copy the kit disk to the output disk. For example, if the kit disk is mounted on DL0: and the output disk is mounted on DL1:, use the following command sequence:

```
>RUN BRU   
  
BRU>/VERIFY   
From: DL0:   
To: DL1:   
BRU - Starting verify pass  
  
BRU - Completed  
  
BRU> 
```

If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new RL02 output disk. If the verify operation fails once again, it is likely that your kit disk is defective and should be replaced.

When BRU finishes, the output disk contains a complete copy of the DIGITAL-supplied kit disk. Remove the kit disk from its drive, and safely store it for later use in making fresh copies, should the need arise.

The output disk is now referred to as the system disk.

You must now decide which of the two system images on the system disk you wish to use. Read Section 5.2.2.1 next.

**5.2.2.1 Deleting the Unused System from the System Disk** - There are two RSX-11M-PLUS system images supplied on the pregenerated kit disk.

In directory [1,54] is an RSX-11M-PLUS system image that does not take advantage of instruction- and data-space mapping hardware. (For clarity, this chapter refers to this system as "the [1,54] system.") This system is intended primarily for processors that do not incorporate instruction- and data-space (abbreviated I- and D-space) mapping hardware, such as the PDP-11/23-PLUS, PDP-11/24, and MicroPDP-11/23.

The [1,54] system does not support user- or kernel-mode I- and D-space tasks or supervisor-mode libraries. Support for shadow recording, console logging, and parity memory has also been omitted from this system.

The [1,54] system can also run on processors that include separate instruction- and data-space mapping hardware. Note, though, that when you run the [1,54] system on these processors, the system does not take advantage of the I- and D-space mapping hardware.

When you hardware bootstrapped your kit disk for copying, the [1,54] system was the system that began running.

In directory [2,54] is an RSX-11M-PLUS system image that does take advantage of instruction- and data-space mapping hardware. (This chapter refers to this system as "the [2,54] system.") This system can be run only on the PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, and PDP-11/84 processors, all of which incorporate separate I- and D-space mapping hardware. If you are running the pregenerated system on any of these processors, you should use the [2,54] system to take advantage of the mapping hardware.

## PREGENERATED RSX-11M-PLUS KITS

The [2,54] system supports user- and kernel-mode I- and D-space tasks and supervisor-mode libraries. It includes all RSX-11M-PLUS Executive features.

Both the [1,54] and [2,54] systems support the same devices (see Section 5.5.2.2 for a complete list).

Once you have decided which system you wish to use, use the following procedure to delete the unused system:

1. If it is not still mounted, place the system disk in a drive on your system. If you are not familiar with the procedure for using RL02 disk drives, consult the hardware documentation for the RL02 drive.
2. Hardware bootstrap the system disk. (Consult DIGITAL Field Service or your processor documentation for information on hardware bootstrapping devices.) This brings the [1,54] system into memory. The system startup procedure is invoked automatically and prompts you for the date and time. Press CTRL/C in response to the prompt. Then type ABO AT. in response to the MCR prompt to abort Indirect and exit from the startup procedure.

The following is an example of bootstrapping a system disk mounted in drive DL1: on a PDP-11/23-PLUS processor:

```
TESTING MEMORY
0512. KW
START? DL1 (RET)
```

```
RSX-11M-PLUS V3.0 BL24 512.KW System:"RL02SY"
>RED DL1:=SY:
>RED DL1:=LB:
>RED DL1:=SP:
>MOU DL1:"PREGENNEDSYS"
>@DL1:[1,2]STARTUP
```

RSX-11M-PLUS system startup procedure

Copyright (C) 1985 by Digital Equipment Corporation

Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.). After entering the time and date press the return key.  
Example: 13:55 30-MAR-85

```
MCR>ABO AT. (RET) Time and date (CTRL/C)
```

```
12:00:47 Task "AT.T0 " terminated
Aborted via directive or CLI
```

3. If you intend to use the [1,54] system, skip to step 5.

If you intend to use the [2,54] system, software bootstrap that system using the following MCR command line:

```
>BOO [2,54]RSX11M (RET)
```

## PREGENERATED RSX-11M-PLUS KITS

This brings the [2,54] system into memory, and the system prints an identification message. The system startup procedure is invoked automatically again, and prompts you for the date and time. Press CTRL/C in response to the prompt. Then type ABO AT. in response to the MCR prompt to abort Indirect and exit from the startup procedure.

The following is an example of software bootstrapping the [2,54] system:

```
>BOO [2,54]RSX11MRET
RSX-11M-PLUS V3.0 BL24      512.KW System:"RL02ID"
>RED DL1:=SY:
>RED DL1:=LB:
>RED DL1:=SP:
>MOU DL1:"PREGENNEDSYS"
>@DL1:[1,2]STARTUP
```

RSX-11M-PLUS system startup procedure

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Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.) . After entering the time and date press the return key. Example: 13:55 30-MAR-85

```
Time and date CTRL/C
MCR>ABO AT.RET
12:00:47 Task "AT T0" terminated
Aborted via directive or CLI
```

Remember that the [2,54] system only runs on processors that include the instruction- and data-space mapping hardware. If you software bootstrap the [2,54] system on a processor that does not have instruction- and data-space hardware, the system will not run.

4. Make the [2,54] system hardware-bootstrappable. Use the following MCR command line:

```
>SAVE /WBRET
```

This makes the [2,54] system hardware-bootstrappable. The [2,54] system begins running again, and the startup procedure is automatically invoked once again. Press CTRL/C in response to the prompt. Then type ABO TA ni response to the MCR prompt to abort Indirect and exit from the startup procedure.

The following is an example of making the [2,54] system hardware-bootstrappable:

```
>SAV/WB RET
DM0-- System disk being dismounted
DM0-- SYSTEM dismounted from DL1: *** Final dismount initiated ***
12:10:17 *** DL1: -- Dismount complete
>
```

## PREGENERATED RSX-11M-PLUS KITS

```
RSX-11M-PLUS V3.0  BL24  512.KW  System: "RL02ID"  
>RED DL1:=SY:  
>RED DL1:=LB:  
>RED DL1:=SP:  
>MOU DL1:"PREGENNEDSYS"  
>@DL1:[1,2]STARTUP
```

RSX-11M-PLUS system startup procedure

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Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.). After entering the time and date press the return key.  
Example: 13:55 30-MAR-85

```
Time and date :    
MCR>ABO AT. 
```

```
12:00:47 Task "AT.T0 " terminated  
Aborted via directive or CLI
```

5. Delete the files that belong to the system that you chose not to use. Note that if you should later change your mind and decide to use the system you delete in this step, you can make a new system disk copy from the DIGITAL-supplied kit disk.

The system disk contains an automated procedure, called DELETESYS.CMD, that makes deleting the unused system easy. Invoke this procedure using the following MCR command line:

```
>@[1,2]DELETESYS 
```

This procedure deletes only the files that belong to the system you are not presently running. The procedure asks you to confirm that you have made a copy of your kit disk and that you are sure you want to delete the unused system.

6. When the DELETESYS.CMD procedure finishes, the installation of your pregenerated system is complete.

The following is an example of invoking the DELETESYS.CMD procedure to delete the [2,54] system:

```
>@[1,2]DELETESYS 
```

This procedure deletes those files specific to the currently nonactive system. This procedure assumes that you are now running the system that you have made hardware-bootstrappable.

```
Have you made a copy of your distribution kit? Y 
```

This procedure will delete the I- and D-space system in [2,54], the FCS supervisor-mode library, and the tasks linked to that library.

```
Are you sure that you want to continue? Y 
```

The following display shows the number of blocks used and the number of blocks free before deleting anything.

## PREGENERATED RSX-11M-PLUS KITS

DL1: has 207. blocks free, 20273. blocks used out of 20480.  
Largest contiguous space =2207. blocks  
631. file headers are free, 628. headers used out of 1259.

Deleting...

The following display shows the number of blocks used and the number now free for use on the system disk.

DL1: has 5199. blocks free, 15281. blocks used out of 20480.  
Largest contiguous space = 3430. blocks  
772. file headers are free, 487. headers used out of 1259.

End of DELETESYS.CMD

>

Turn next to Section 5.4 for information on other changes you may wish to make to the system.

### 5.2.3 Copying the RL02 Kit Disk to an RD51 or Other Disk

This section describes how to copy the RL02 kit disk to an RD51, RD52, RD53 or other DU-type disk. (The DU-type disks include the RA60, RA80, RA81, RC25, RD51, RD52, and RD53). It also describes the procedure for deleting unused system files to increase available space on the system disk.

There are three major steps in the process of copying the RL02 kit disk for use on a DU-type system disk.

1. Copy the RL02 kit disk to the DU-type system disk.
2. Create a new system image file using the appropriate VMR command file.
3. Bootstrap the system, save the system, and make it hardware-bootstrappable.

You need one blank DU-type disk to make a copy of the RL02 kit disk.

Use the procedure described in the following sections to copy the kit disk. (The output disk referred to in this section is the blank DU-type disk to which you are copying the kit disk.)

**5.2.3.1 Copying the Kit Disk** - Use the following procedure to copy the RL02 kit disk to the DU-type output disk:

1. Place the kit disk and the output disk in their respective drives. If you are not familiar with the procedure for using either of the disk drives, consult the hardware documentation for the appropriate disk drives.

## PREGENERATED RSX-11M-PLUS KITS

- Hardware bootstrap the kit disk. (Consult DIGITAL Field Service or your processor documentation for information on hardware bootstrapping devices.) This brings the pregenerated system into memory. The system startup procedure is invoked automatically and prompts you for the date and time. Press CTRL/C in response to the prompt. Then type ABO TA ni response to the MCR prompt to abort Indirect and exit from the startup procedure. This procedure will be invoked again after you copy your kit. The following is an example of bootstrapping a kit disk mounted in drive DLO: on a PDP-11/23-PLUS processor:

```
TESTING MEMORY
0512. KW
START? DL (RET)
```

```
RSX-11M-PLUS V3.0 BL24 512.KW System:"RL02SY"
>RED DL:=SY:
>RED DL:=LB:
>RED DL:=SP:
>MOU DL:"PREGENNEDSYS"
>@DL:[1,2]STARTUP
```

RSX-11M-PLUS system startup procedure

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Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.). After entering the time and date press the return key.  
Example: 13:55 30-MAR-85

```
Time and date (CTRL C)
MCR>ABO AT. (RET)
```

```
12:00:47 Task "AT.T0" terminated
Aborted via directive or CLI
```

If you cannot bootstrap your system, check your system's site configuration documentation or consult DIGITAL Field Service to see whether your hardware has the standard CSR and vector addresses for the RL02 drive controller. The CSR address must be 174400 (octal) and the vector 160 (octal) .

- Write-protect the kit disk, using the write-protect switch on the drive. Software bootstrap the BRUSYS stand-alone system, using the following command line:

```
>BOO [6,54]BRUSYS (RET)
```

This brings the BRUSYS system into memory. The BRUSYS system prints an identification line on the console terminal, then runs the Stand-Alone Configuration and Disk Sizing Program (CNF).

- Enter the device specifications in response to the CNF prompts. The "first device" is the drive containing the kit disk; the "second device" is the drive containing the output disk. For example:

```
Enter first device: DL0: (RET)
Enter second device: DU0: (RET)
```

## PREGENERATED RSX-11M-PLUS KITS

5. Press the RETURN key, then enter the date and time using the TIM command. Use the TIM command again to verify that you entered the correct date and time. For example:

```
Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY' (RET)
>TIM 10:17 12/02/84 (RET)
>TIM (RET)
10:17:01 2-DEC-84
```

6. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output device is DUO:, use the following command sequence:

```
>RUN BAD (RET)
BAD>DUO:/LIST (RET)
BAD -- DUO: Total bad blocks= 0.
BAD> (CTRL Z)
```

If BAD finds that your output disk has bad blocks on it, the blocks will be marked on the disk and will not be used again by RSX-11M-PLUS. If your output disk has a large number of bad blocks (for example, more than 10), or if block 0 is bad, you should use another disk.

7. Run the Backup and Restore Utility (BRU) to copy the kit disk to the output disk. For example, if the kit disk is mounted on DLO: and the output disk is an RD51 drive designated DUO:, use the following command sequence:

```
>RUN BRU (RET)
BRU>/VERIFY/MAX:9633/HEADERS:1204 (RET)
From: DLO: (RET)
To: DUO: (RET)
BRU - This disk will not contain a hardware bootable system
BRU - Starting verify pass
BRU - Completed
BRU> (CTRL Z)
```

You should alter the values specified in the /MAX and /HEADERS qualifiers to suit the output disk volume. Use the appropriate values from Table 5-1 for the arguments of the /MAX and /HEADERS qualifiers.

If BRU prints messages indicating that the verify operation failed, repeat this entire step. If the verify operation fails again, use a new output disk (or, if the output disk is a fixed-medium device, have the drive serviced). If the verify operation fails once again, it is likely that your kit disk is defective and should be replaced.

When BRU finishes, the output disk contains a complete copy of the DIGITAL-supplied kit disk. Leave both disks spinning in their respective drives, as they are both needed in the next step.

PREGENERATED RSX-11M-PLUS KITS

Table 5-1  
Disk Initialization Qualifier Values

Device	Value for /MAX Qualifier	Value for /HEADERS Qualifier
RA60	24617	12308
RA80	14591	7295
RA81	54815	51699
RC25	3130	1565
RD51	1328	664
RD52	3719	1859
RD53	8529	4264

At this point, the system image on your output disk is neither hardware- nor software-bootstrappable, since the DU: driver is not loaded in the pregenerated system.

From this point onward, we will refer to the output disk you created in this section as the **system disk**.

5.2.3.2 **Creating the New System Image File Using VMR** - The system disk contains two unsaved system task files ([1,54]RSX11M.TSK and [2,54]RSX11M.TSK). You will use one of these system task files to create the new system image file.

In directory [1,54] is an RSX-11M-PLUS system task file that does not take advantage of instruction- and data-space mapping hardware. (For clarity, this chapter refers to this system as "the [1,54] system.") This system is intended primarily for the MicroPDP-11/23, PDP-11/23-PLUS, and PDP-11/24 processors, none of which incorporate instruction- and data-space (abbreviated I- and D-space) mapping hardware.

The [1,54] system does not support user- or kernel-mode I- and D-space tasks or supervisor-mode libraries. Support for shadow recording, console logging, and parity memory has also been omitted from this system.

The [1,54] system can also run on processors that include instruction- and data-space mapping hardware. Note, though, that when you run the [1,54] system on processors that include separate instruction- and data-space mapping hardware, the system does not take advantage of that mapping hardware.

When you hardware bootstrapped your kit disk for copying, the [1,54] system was the system that began running.

In directory [2,54] is an RSX-11M-PLUS system image that does take advantage of instruction- and data-space mapping hardware. (This chapter refers to this system as "the [2,54] system.") This system can be run only on the PDP-11/44, PDP-11/70, MicroPDP-11/73, MicroPDP-11/83, and PDP-11/84 processors, all of which incorporate I- and D-space mapping hardware. If you are running the pregenerated system on any of these processors, you should use the [2,54] system.

The [2,54] system supports user- and kernel-mode I- and D-space tasks and supervisor-mode libraries. It includes all RSX-11M-PLUS Executive features.

Both the [1,54] and [2,54] systems support the same devices (see Section 5.5.2.2 for a complete list).

## PREGENERATED RSX-11M-PLUS KITS

Decide which of the systems is appropriate for your hardware installation. Then use the following procedure to create a new system image file (RSX11M.SYS)

1. Hardware bootstrap the kit disk. This brings the [1,54] system into memory. The startup procedure is invoked automatically and prompts you for the date and time. Press CTRL/C in response to the prompt. Then, type ABO AT. in response to the MCR prompt to abort Indirect and to exit from the startup procedure.

2. Load the DU: driver, using the following MCR command line:

```
>LOA DU:/PAR=GEN (RET)
```

3. Install the RCT task, using the following MCR command line:

```
>INS $RCT (RET)
```

4. Write-protect the kit disk, using the write-protect switch on the drive.

5. Bring the DU-type disk drive on line, using the following CON command line:

```
>CON ONL ALL (RET)
```

6. Mount the target system disk. For example, if the system disk is device DUO:, use the following MCR command line:

```
>MOU DUO:PREGENNEDSYS (RET)
```

7. Set your default directory to [1,54] if you intend to use the [1,54] system. Set your default directory to [2,54] if you intend to use the [2,54] system. For example, if you intend to use the [2,54] system, use the following MCR command line:

```
>SET /UIC=[2,54] (RET)
```

8. Assign logical devices SY: and LB: to the system disk. For example, if your system disk is DUO:, use the following MCR command sequence:

```
>ASN DUO:=SY: (RET)
```

```
>ASN DUO:=LB: (RET)
```

9. Delete the RSX11M.SYS file and create a new, unsaved one from the RSX11M.TSK file. Use the following MCR command sequence:

```
>DEL RSX11M.SYS;* (RET)
```

```
>PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK (RET)
```

10. Run VMR using the DUVMR.COMD command file. Disregard any messages that are printed by VMR. Use the following MCR command sequence:

```
>VMR @DUVMR (RET)
```

.

. [Messages from VMR appear here]

.

When VMR finishes, your system disk contains a software-bootstrappable, unsaved system image.

**5.2.3.3 Bootstrapping and Saving the New System Image** - Use the following procedure to save the new system image and make it hardware-bootstrappable:

1. Software bootstrap the new system image. For example, if your system disk is DU0: and you just re-created the system image in directory [2,54], use the following MCR command line:

```
>BOO DU0:[2,54] (RET)
```

This brings the [2,54] system into memory and prints an identification message on the console terminal. For example:

```
RSX-11M-PLUS V3.0 BL24
```

2. Save the system and make it hardware-bootstrappable, using the following MCR command line:

```
>SAV /WB (RET)
```

The system prints an identification message, and the system startup procedure is invoked and prompts you for the date and time. Type CTRL/C in response to the prompt. Then, enter ABO AT. in response to the MCR prompt to abort Indirect and to exit from the startup procedure.

The following is an example of making the [1,54] system hardware-bootstrappable:

```
>SAV /WB (RET)
```

```
RSX-11M-PLUS V3.0 BL24 512.KW System: "RL02SY"
>RED DU: =SY:
>RED DU: =LB:
>RED DU: =SP:
>MOU DU:"PREGENNEDSYS"
>@DU:[1,2]STARTUP
```

```
RSX-11M-PLUS system startup procedure
```

```
Copyright (C) 1985 by Digital Equipment Corporation
```

```
Please enter the time and date. The month name must
be three characters long (example: SEP) and the time
must be in 24-hour format (example: 13:00 for 1:00 p.m.).
After entering the time and date press the return key.
Example: 13:55 30-MAR-85
```

```
Time and date (CTRL/C)
MCR>ABO AT. (RET)
```

```
12:00:47 Task "AT.T0 " terminated
Aborted via directive or CLI
```

3. Your system disk now contains a hardware-bootstrappable system.

You must now delete the system image and files of the system that you do not intend to use.

## PREGENERATED RSX-11M-PLUS KITS

**5.2.3.4 Deleting the Unused System from the System Disk** - Use the following procedure to delete the system you did not make hardware-bootstrappable in the previous section:

1. If you are not already running the hardware-bootstrappable system, mount the system disk and hardware bootstrap it as you did before.

This brings the hardware-bootstrappable system into memory. The startup command file is invoked automatically and prompts you for the date and time. Press CTRL/C in response to the prompt. Then, enter ABO AT. in response to the MCR prompt to abort Indirect and to exit from the startup command file.

2. Delete the files that belong to the system that you chose not to use. Note that if you should later change your mind and decide to use the system you delete in this step, you can make a new system disk copy from the DIGITAL-supplied kit disk, and perform the procedure detailed in the previous sections again.

The system disk contains an automated procedure called DELETESYS.COMD that makes deleting the unused system easy. Invoke this procedure using the following MCR command line:

```
>@[1,2]DELETESYS 
```

This procedure deletes only the files that belong to the system you are not presently running. The procedure asks you to confirm that you are sure you want to delete the files.

3. When the DELETESYS.COMD procedure finishes, the installation of your pregenerated system is complete.

The following is a sample of a terminal trace produced by a user invoking the DELETESYS.COMD procedure to delete the [1,54] system:

```
>@[1,2]DELETESYS 
```

This procedure deletes those files specific to the currently nonactive system. This procedure assumes that you are now running the system that you have made hardware-bootstrappable.

```
Have you made a copy of your distribution kit? 
```

This procedure will delete the non-I- and D-space system in [1,54], the FCS resident library, and the tasks linked to that library.

```
Are you sure that you want to continue?
```

The following display shows the number of blocks used and the number of blocks free before deleting anything.

```
DUO: has 1327. blocks free, 20273. blocks used out of 21600.  
Largest contiguous space = 1327. blocks  
700. file headers are free, 628. headers used out of 1328.
```

Deleting...

The following display shows the number of blocks used and the number now free for use on the system disk.

## PREGENERATED RSX-11M-PLUS KITS

DU0: has 5717. blocks free, 15883. blocks used out of 21600.  
Largest contiguous space = 3100. blocks  
823. file headers are free, 505. headers used out of 1328.

End of DELETESYS.CMD

>

Your system disk now contains a single, hardware-bootstrappable system. Turn next to Section 5.4 for information on other changes you may wish to make to the system.

### 5.3 AN EXAMPLE OF COPYING THE SYSTEM

The following is an example terminal trace produced by a user bootstrapping the RL02 kit disk on a PDP-11/23-PLUS system, copying the kit disk to another RL02 disk, deleting the unused [2,54] system, and determining the current system crash device.

@

TESTING MEMORY  
0512.KW  
START? DL0

RSX-11M-PLUS V3.0 BL24 512.K System:"RL02SY"  
>RED DL:=SY:  
>RED DL:=LB:  
>RED DL:=SP:  
>MOU DL:"PREGENNEDSYS"  
>@DL:[1,2]STARTUP

#### RSX-11M-PLUS system startup procedure

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Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.). After entering the time and date press the return key.  
Example: 13:55 30-MAR-85

Time and date : ^C

MCR>ABO AT.

12:00:47 Task "AT.T0 " terminated  
Aborted via directive or CLI  
>BOO [6,54]BRUSYS

RSX-11M/RSX-11M-PLUS Standalone Copy System V03

RSX-11M/RSX-11M-PLUS Standalone Configuration and Disk Sizing Program

Valid switches are:

/CSR=nnnnnn to change the default device CSR  
/VEC=nnn to change the default device vector  
/FOR=n to change the default magtape formatter number  
/DEV to list all default device CSR and vectors

PREGENERATED RSX-11M-PLUS KITS

Enter first device: DL0:

Enter second device: DL1:

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY'

```
>TIM 13:34 06/06/83
>TIM
13:34:01 6-JUN-83
>RUN BAD
>
BAD>DL1:/LIST
BAD -- DL1: Total bad blocks= 0.
BAD> ^Z
>RUN BRU
>
BRU>/VERIFY
From: DL0:
To: DL1:
BRU -- Starting verify pass

BRU -- Completed

BRU> ^Z

>
```

[Here system is halted, then system disk is hardware bootstrapped again.]

@

```
TESTING MEMORY
0512.KW
START? DL1
```

```
RSX-11M-PLUS V3.0 BL24 512.K System:"RL02SY"
>RED DL1:=SY:
>RED DL1:=LB:
>RED DL1:=SP:
>MOU DL1:"PREGENNEDSYS"
>@DL1:[1,2]STARTUP
```

RSX-11M-PLUS system startup procedure

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Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.). After entering the time and date press the return key.  
Example: 13:55 30-MAR-85

Time and date : ^C

MCR>ABO AT.

```
12:00:47 Task "AT.T0 " terminated
Aborted via directive or CLI
>@[1,2]DELETESYS
```

This procedure deletes those files specific to the currently nonactive system. This procedure assumes that you are now running the system that you have made hardware-bootstrappable.

PREGENERATED RSX-11M-PLUS KITS

Have you made a copy of your distribution kit? Y

This procedure will delete the I- and D-space system in [2,54], the FCS supervisor-mode library, and the tasks linked to that library.

Are you sure that you want to continue? Y

The following display shows the number of blocks used and the number of blocks free before deleting anything.

DL1: has 2229. blocks free, 18251. blocks used out of 20480.  
Largest contiguous space = 2229. blocks  
719. file headers are free, 540. headers used out of 1259.

Deleting...

The following display shows the number of blocks used and the number now free for use on the system disk.

DL1: has 6720. blocks free, 13760. blocks used out of 20480.  
Largest contiguous space = 3022. blocks  
825. file headers are free, 434. headers used out of 1259.

End of DELETESYS.CMD

>

[System is halted again; system disk is mounted and bootstrapped on DL0:..]

@

TESTING MEMORY  
0512.KW  
START? DL0

RSX-11M-PLUS V3.0 BL24 512.K System:"RL02SY"  
>RED DL:=SY:  
>RED DL:=LB:  
>RED DL:=SP:  
>MOU DL:"PREGENNEDSYS"  
>@DL:[1,2]STARTUP

RSX-11M-PLUS system startup procedure

Copyright (C) 1985 by Digital Equipment Corporation

Please enter the time and date. The month name must be three characters long (example: SEP) and the time must be in 24-hour format (example: 13:00 for 1:00 p.m.). After entering the time and date press the return key.  
Example: 13:55 30-MAR-85

Time and date : ^C

MCR>ABO AT.

12:00:47 Task "AT.T0 " terminated  
Aborted via directive or CLI

PREGENERATED RSX-11M-PLUS KITS

- Step 1 - Deallocating DECnet communications executive  
System configuration does not include DECnet
- Step 2 - Installation of DAPRES  
System configuration does not include RMS DECnet (DAPRES)
- Step 3 - Allocating checkpoint space  
System checkpoint file size is 512. blocks  
Secondary pool extension size is 0 bytes
- Step 4 - Creating command interpreters
- Step 5 - Establishing device configuration  
  
(Note: Depending upon system configuration,  
this may take up to a minute to complete)
- Step 6 - Loading auxiliary device drivers  
No auxiliary driver will be loaded
- Step 7 - Configuring devices on-line  
All available devices will be configured on-line
- Step 8 - Starting error logging  
Error logging will be started
- Step 9 - Setting terminal characteristics
- Step 10 - Starting Resource Accounting
- Step 11 - Starting Queue Manager  
The Queue Manager (QMG) will be started
- Step 12 - Starting batch processors  
1 batch processor will be started
- Step 13 - Starting Print processors  
No print processors will be started
- Step 14 - Installing applications  
No applications will be installed
- Step 15 - Invoked auxiliary startup file  
There is no auxiliary startup file
- Step 16 - Finished

```

*****
*
*           S y s t e m   C u s t o m i z a t i o n
*           -----
*
*   After installing your system, you will probably wish to
*   perform the following customizations:
*
*   1) Add user accounts - See Chapter 2 of the RSX-11M/M-PLUS
*      System Management Guide.
*
*   2) Modify the system startup parameter file, which is the
*      data file which controls the startup procedure. This
*      file ([1,2]SYSPARAM.DAT) should be modified to reflect
*      your particular hardware/software configuration. See
*      Chapter 5 of the RSX-11M-PLUS System Generation and
*      Installation Guide.
*
*
*****

```

PREGENERATED RSX-11M-PLUS KITS

```

*      3) You may wish to modify the following text and command      *
*      files to suit your installation                                *
*
*      File      Purpose
*      ----      -
*      [1,2]SHUTUP.COMD  Invoked by SHUTUP when taking down
*                        the system to perform system
*                        dependent shutdown tasks
*
*      [1,2]QMGSTOP.COMD  Invoked by SHUTUP to stop the Queue
*                        Manager and spooling subsystem
*
*      [1,2]LOGIN.TXT    Displayed on user's terminal when
*                        logging in
*
*      [1,2]BATCH.TXT    Displayed at the beginning of each
*                        batch log file
*

```

```

*****
Press return to continue

```

```

*****
*
*      Installation of your RSX-11M-PLUS
*
*      - operating system has completed successfully
*
*****

```

\$

STARTUP - Console logging off

\$

```

Have a Good Evening
06-JUN-85 20:10 TT0:  logged off RL02SY
$
>HEL SYSTEM/SYSTEM

```

```

RSX-11M-PLUS V3.0 BL24 [1,54] System RL02SY
06-JUN-85 20:11 Logged on Terminal TT0:  as SYS1

```

Good Evening

20:11:03 Login user SYSTEM [1,1] TT0:

```

*****
*
*      Welcome to RSX-11M-PLUS
*
*      Version 3.0 Base level 24
*
*      This is file LB:[1,2]LOGIN.TXT
*
*****

```

```

>SET /CRASH_DEVICE=DL1:
SET -- WARNING, Crash device DL1: has been successfully loaded
>

```

## 5.4 SYSTEM MANAGEMENT FILES

There are files and procedures in the pregenerated RSX-11M-PLUS system that you can use to manage and enhance your system. This section describes the files that are used for starting up and shutting down the system, as well as for logging in to and logging out of the system, and shows how you can change the files to suit your needs. It also explains how you can create your own files to perform other system management tasks, and how you can use and enhance the on-line help facility.

### 5.4.1 The System Startup Procedure

Whenever you bootstrap your system disk, the system startup procedure is invoked automatically. This procedure, controlled by a command file named `STARTUP.COMD`, performs various housekeeping tasks, determines the peripheral configuration, and brings all available peripheral devices on line.

For the automatic system startup procedure to be able properly to identify the peripheral devices connected to your processor, those devices must be at DIGITAL-standard CSR and vector addresses. If you have a PDP-11/23-PLUS or PDP-11/24 packaged system, or one of the MicroPDP-11 series packaged systems, your devices are probably at the standard CSR and vector addresses. If you are not sure about whether your system is configured properly, consult DIGITAL Field Service.

If, after the startup procedure has finished, you are unable to use a particular peripheral device connected to your system, you should check to see whether that device appears at the standard CSR and vector addresses. If it does not, you must connect the device to the standard CSR and vector addresses if you wish to use it with the pregenerated system.

You may wish to make changes to the startup procedure to suit your hardware and your requirements. For example, if you install DECnet, you can change the startup procedure so that DECnet will be started up automatically each time you bootstrap the system. You might also wish to change the startup procedure to set the characteristics of the terminals connected to your system, or to install applications.

This section explains how the startup procedure works, and shows you how to edit the procedure to suit your needs.

#### 5.4.1.1 How the Startup Procedure Works - The system startup procedure involves three or more files, all of which are contained in directory [1,2] on the system disk. These files work together to prepare your RSX-11M-PLUS system for use.

Two of the files are indirect command files. These are the files that actually perform the startup tasks. The indirect command files get the parameters they use in issuing commands to the system from a configuration file. You can edit this file to alter the startup parameters. The statements in the configuration file are mostly plain-English words (instead of DCL commands or Indirect directives), so you don't have to know the proper DCL commands or learn how to use Indirect before you can alter the startup command procedure.

## PREGENERATED RSX-11M-PLUS KITS

The startup procedure is controlled by [1,2]STARTUP.CMD. This file invokes [1,2]READCON.CMD, which interprets statements contained in the configuration data file, [1,2]SYSPARAM.DAT. STARTUP.CMD uses the data obtained by READCON.CMD to generate the correct set of commands to perform various tasks. The following is an example of a statement in the configuration file:

```
QUEUE_MANAGER=YES
```

This statement controls whether the Queue Manager (QMG) is installed. If you specify QUEUE\_MANAGER=YES, the startup procedure installs the Queue Manager tasks and starts QMG. The startup procedure issues the following DCL command:

```
START/QUEUE/MANAGER
```

You should study the DIGITAL-supplied configuration file and understand the effects of the statements in it before you try to make any changes.

**5.4.1.2 Description of the Configuration File Statements** - This section describes the syntax and function of each of the statements that can be included or changed in the DIGITAL-supplied configuration data file to suit your needs.

If you eliminate any of the statements from the configuration data file, the startup procedure uses a default value for that statement. The default for each statement is indicated after the description. If you are uncertain about the effects of altering the value for a particular statement, use the default value.

The following are descriptions, in alphabetical order, of the statements that can be contained in the configuration file:

### ACCOUNT\_FILES=n

This statement specifies the limit on the number of versions of the Resource Accounting transaction file, LB:[1,6]ACNTRN.SYS, that are kept on the system disk. The latest n files are retained and the older versions purged each time the startup procedure is invoked.

Chapter 17 of the RSX-11M/M-PLUS System Management Guide contains more information on Resource Accounting.

Default: ACCOUNT\_FILES=2.

### APPLICATION=description,filename

This statement specifies a command file to be invoked to install an application program or package. It also allows you to specify descriptive text that is printed on the terminal by the startup procedure as this statement is processed.

If you include this statement, the startup procedure invokes the command file specified as a nested indirect command file. You can use this command file to install languages or other application packages.

You may include this statement in the configuration file as many times as necessary to install all your applications.

## PREGENERATED RSX-11M-PLUS KITS

The first option (description) is a text string that describes the application that is to be installed. This text string is printed on the console terminal if the PARAMETERS=YES statement is included in the startup configuration file. The text string is printed in the following format:

Installing 'description' application

The second option (filename) is the file specification of the command file that contains the commands to install the application. If you do not specify a file type, the startup procedure defaults to a file type of .INS for the command file.

The following is an example of using the APPLICATION statement:

```
APPLICATION=Fortran-77, LB:[1,2]F77.INS
```

The startup procedure would process the statement in the example by invoking the F77.INS as a nested indirect command file.

If you do not wish to install any applications, you may omit this statement, or specify APPLICATION=NONE. See the documentation that accompanies the application program or package for information on the commands necessary to install that particular application.

Default: No applications are installed.

### **BATCH\_PROCESSORS=n**

This statement specifies the number of batch processor tasks to be initialized. If you specify BATCH\_PROCESSORS=2, two batch processor tasks, named BAP0 and BAP1, are initialized during the startup procedure.

See the RSX-11M/M-PLUS Batch and Queue Operations Manual for more information on initializing batch processors.

Default: BATCH\_PROCESSORS=1.

### **CHECKPOINT\_SPACE=n**

This statement specifies, in decimal disk blocks, the size of the system checkpoint file that is allocated. This is a system performance parameter, and should be altered only by someone with a thorough understanding of RSX-11M-PLUS.

Default: CHECKPOINT\_SPACE=1024.

### **CLI=cliname**

This statement specifies the name of the command line interpreter (CLI) to be used when the startup procedure invokes another command file for the STARTFILE statement. You may specify "DCL" or the name of a user-written CLI as arguments to this statement. Note that all the commands in the system startup procedure (STARTUP.CMD and subsidiary files) are sent to DCL, regardless of the argument you specify for this statement.

See also the description of the STARTFILE statement.

Default: CLI=MCR

## PREGENERATED RSX-11M-PLUS KITS

### COMMANDS=yes/no

This statement controls whether the actual DCL commands issued by the startup procedure are printed on the console terminal.

For each major step it performs, the startup procedure can print none, some, or all of the following types of information:

Step n - description of step  
          explanatory text  
          parameters from configuration file  
the actual command(s) used to perform the step

The following is an example of what the startup procedure could print on the system console for Step 3:

```
Step 3 - Allocating checkpoint space and secondary pool
        Allocating system controlled checkpoint space ...
        System checkpoint file size is 1024. blocks
        Secondary pool extension size is 0 bytes.
ACS SY:/BLKS=1024.
```

In the example, the line reading "ACS SY:/BLKS=1024." is printed only if the configuration file contains the COMMANDS=YES statement.

You might specify COMMANDS=YES in the course of debugging changes you make to the configuration file or in learning about what the startup procedure does. You should normally use the default for this statement (NO), though, to avoid producing a confusing display every time the system is restarted.

See also the descriptions of the LONG\_TEXT, SETDISPLAY, PARAMETERS, and QUIET statements.

Default: COMMANDS=YES

### CON\_ONLINE\_ALL=yes/no

This statement controls whether the startup procedure issues a CON ONLINE ALL command to attempt to bring all configured devices on line. If you specify CON\_ONLINE\_ALL=NO, the CON ONLINE ALL command normally issued by the startup procedure is suppressed, which means that no hardware devices other than the system disk and console terminal are on line when the startup procedure finishes. You should use the default for this statement unless you want to bring devices on line individually using the CONFIGURE statement.

See Chapter 15 of the RSX-11M/M-PLUS System Management Guide for more information on the CON ONLINE ALL command.

Default: CON\_ONLINE\_ALL=YES

### CONFIGURE=filename

This statement specifies a command file to be invoked before all peripheral devices are brought on line with the CON ONLINE ALL command.

You should include the full file specification (device, directory, and file name) for the command file.

## PREGENERATED RSX-11M-PLUS KITS

If you include this statement, the command file specified is invoked before the startup procedure interprets the `CON_ONLINE_ALL` statement. You can place peripheral configuration commands in the specified command file to alter the hardware configuration.

This statement might be useful in bringing a subset of all available devices on line in the course of tracking down a hardware problem or when you use one hardware system for two distinctly different applications. See Chapter 15 of the RSX-11M/M-PLUS System Management Guide for information on what configuration commands and options are available.

If you do not need to include any additional configuration commands, you may omit this statement or specify `CONFIGURE=NONE`.

See also the description of the `CON_ONLINE_ALL` statement.

Default: `CONFIGURE=NONE`

### DAPRES=yes/no

This statement controls whether the DECnet RMS Data Access Package is installed. If you specify `DAPRES=YES`, `[1,1]DAPRES.TSK` is installed when the startup procedure is invoked. `DAPRES.TSK` is the resident library necessary to support transparent network file access using RMS.

See the DECnet and the RMS documentation for more information on `DAPRES.TSK`. See also the descriptions of the `DECNET` and `DECNETRMS` statements.

Default: `DAPRES=NO`

### DECNET=yes/no

This statement controls whether memory space normally reserved for the DECnet Communications Executive (CEX) is deallocated, and whether `[1,2]NETSTART.COMD` is invoked during the startup procedure. If DECnet is installed on your system, specify `DECNET=YES`. If DECnet is not installed on your system, specify `DECNET=NO` so that the memory space is deallocated and the size of the dynamic storage region (pool) is increased.

If you specify `DECNET=YES`, memory space for the Communications Executive is not deallocated and a network startup file, named `[1,2]NETSTART.COMD`, is invoked.

See the DECnet documentation for more information on CEX and DECnet. See also the descriptions of the `DAPRES` and `DECNET_RMS` statements.

Default: The startup procedure determines whether or not DECnet is installed on your system and takes the appropriate action.

### DECNET\_RMS=yes/no

This statement is equivalent to the `DAPRES` statement; see the description of that statement. See also the description of the `DECNET` statement.

Default: `DECNET_RMS=NO`

**DRIVER=dd:**

This statement loads user-supplied device drivers. For example, if you specify DRIVER=KX: in the configuration file, the KX: device driver is loaded before the startup procedure interprets the CON ONLINE ALL statement. You may include this statement in the configuration file as many times as necessary to load the drivers you require. Each statement causes the startup procedure to load a single driver.

Note that after the startup procedure has automatically determined the devices connected to your system, it loads all of the necessary DIGITAL-supplied device drivers. You do not use this statement for any of the DIGITAL-supported MicroPDP-11 or PDP-11 devices, only for drivers that you have written or obtained for non-DIGITAL devices.

Default: No user-supplied drivers are loaded.

**ERROR\_DISPLAY=yes/no**

This statement controls whether the Error Logging summary totals are displayed in the course of the startup procedure. See the RSX-11M/M-PLUS Error Logging Manual for more information on using this statement and on the easy interface to the Error Logging system.

See also the descriptions of the ERROR\_LIMIT, ERROR\_LOG, and ERROR\_SIZE statements.

Default: ERROR\_DISPLAY=NO

**ERROR\_LIMIT=n**

This statement specifies the limit on the number of versions of the master error logging file [1,6]LOG.ERR kept on the system disk. The latest n files are retained and the older versions purged each time the startup procedure is invoked.

See the RSX-11M/M-PLUS Error Logging Manual for information on the effect of this statement and on the use of the Error Logging system.

See also the descriptions of the ERROR\_DISPLAY, ERROR\_LOG, and ERROR\_SIZE statements.

Default: ERROR\_LIMIT=3.

**ERROR\_LOG=yes/no**

This statement controls whether the startup procedure starts the Error Logging system. Note that if you specify COMMANDS=NO, no messages are displayed when Error Logging is started, regardless of whether Error Logging has been successfully started.

See the RSX-11M/M-PLUS Error Logging Manual for information on the Error Logging system.

See also the descriptions of the ERROR\_DISPLAY, ERROR\_LIMIT, and ERROR\_SIZE statements.

Default: ERROR\_LOG=YES

**ERROR\_SIZE=n**

This statement specifies the maximum size of the master error logging file. The value of the argument is a decimal number that specifies the maximum number of blocks for [1,6]LOG.ERR. See the RSX-11M/M-PLUS Error Logging Manual for information on the effect of this statement and on the use of the Error Logging system.

See also the descriptions of the ERROR\_DISPLAY, ERROR\_LIMIT, and ERROR\_LOG statements.

Default: ERROR\_SIZE=20.

**LOGOUT=yes/no**

This statement controls whether the startup procedure logs out of the console terminal after it finishes. The console terminal is logged in when you power on the system or restart using the Restart button, and it remains logged on while the system startup procedure executes.

You should use the default for this statement unless you have a specific reason to do otherwise. If you specify LOGOUT=NO, when the startup procedure finishes the console terminal is left logged in and privileged.

Default: LOGOUT=NO

**LONG\_TEXT=yes/no**

This statement controls whether an explanatory message describing the action being taken in each step is printed by the startup procedure.

For each major step it performs, the startup procedure can print none, some, or all of the following types of information:

- Step n - Description of step
  - Explanatory text
  - Parameters from configuration file
  - the actual command(s) used to perform the step

The following is an example of what the startup procedure could print on the system console for Step 3:

```
Step 3 - Allocating checkpoint space and secondary pool
          Allocating system controlled checkpoint space ...
          System checkpoint file size is 1024. blocks
          Secondary pool extension size is 0 bytes.
ACS SY:/BLKS=1024.
```

In the example, the "Allocating system controlled checkpoint space ..." line is displayed only if the configuration file contains the LONG\_TEXT=YES statement.

You might specify LONG\_TEXT=YES in the course of debugging changes you make to the configuration file, or in learning about what the startup procedure does. You should normally use the default for this statement, though, to avoid producing a confusing display every time the system is restarted.

## PREGENERATED RSX-11M-PLUS KITS

See also the descriptions of the `COMMANDS`, `PARAMETERS`, `STEP_DISPLAY`, and `QUIET` statements.

Default: `LONG_TEXT=YES`

### `PARAMETERS=yes/no`

This statement controls whether a line indicating the values specified along with each statement is printed on the terminal.

For each major step it performs, the startup procedure can print none, some, or all of the following types of information:

Step n - Description of step  
    Explanatory text  
    Parameters from configuration file  
the actual command(s) used to perform the step

The following is an example of what the startup procedure could print on the system console for Step 3:

Step 3 - Allocating checkpoint space and secondary pool  
    Allocating system controlled checkpoint space ...  
    System checkpoint file size is 1024. blocks  
    Secondary pool extension size is 0 bytes.

ACS SY:/BLKS=1024.

In the example, the lines reading "System checkpoint file size is 1024. blocks" and "Secondary pool extension size is 0 bytes" are printed only if the configuration file contains the `PARAMETERS=YES` statement.

See also the descriptions of the `COMMANDS`, `LONG_TEXT`, `STEP_DISPLAY`, and `QUIET` statements.

Default: `PARAMETERS=NO`

### `PRINTER=ddnn,form,flag`

This statement specifies printer characteristics for spooled printers that use the `LP:` driver. If you do not have any printers attached to your system, or if the printers you do have use the terminal driver (`TT:`), you don't need to include this statement in the configuration file.

For each printer attached to your system, there must be a corresponding `PRINTER` statement in the configuration file. You must specify several arguments in each `PRINTER` statement.

The first argument (`ddnn`) is the device name of the printer (for example, `LP0`). The second argument (`form`) is the form type, specified in the format `FORM:n`. The third argument (`flag`) is the number of flag pages, specified in the format `FLAG:n`.

The startup procedure issues commands to initialize a spooled printer for each `PRINTER` statement you include in the configuration file. You may include any number of `PRINTER` statements in the configuration file; each `PRINTER` statement sets the characteristics for one printer.

## PREGENERATED RSX-11M-PLUS KITS

The following is an example of a typical PRINTER statement:

```
PRINTER=LPO,FORM:0,FLAG:1
```

See the RSX-11M/M-PLUS Batch and Queue Operations Manual for more information on printers and the Queue Manager.

Default: No spooled printers are established.

### QUEUE\_MANAGER=yes/no

This statement controls whether the Queue Manager (QMG) is installed. If you specify QUEUE\_MANAGER=YES, the startup procedure installs the QMG tasks and starts the Queue Manager. This statement does not control batch processors or spooled printers; see the BATCH\_PROCESSORS and PRINTER statements, respectively.

See the RSX-11M/M-PLUS Batch and Queue Operations Manual for information on setting up queues and using the Queue Manager.

Default: QUEUE\_MANAGER=YES

### QUIET=yes/no

This statement is a combination of the COMMANDS, LONG\_TEXT, STEP\_DISPLAY, and PARAMETERS statements. Specifying QUIET=YES is a quick way to choose "silent" system startup, with a minimum of messages appearing on the console terminal.

If you specify QUIET=NO, the startup procedure acts as if you had specified YES to the COMMANDS, LONG\_TEXT, STEP\_DISPLAY, and PARAMETERS statements. If you specify QUIET=YES, the startup procedure acts as if you had specified NO to all four statements.

To avoid possible confusion, you should not include the QUIET statement in the configuration file if that file contains any or all of the COMMANDS, LONG\_TEXT, STEP\_DISPLAY, or PARAMETERS statements. Specify QUIET=YES or QUIET=NO only if you wish all three statements to be set to YES or to NO. Use the individual statements if you wish to pick and choose.

See also the descriptions of the COMMANDS, LONG\_TEXT, STEP\_DISPLAY, and PARAMETERS statements.

Default: There is no default for this statement.

### SECONDARY\_POOL=n

This statement specifies the number of octal words by which secondary pool is increased when the startup procedure executes. This is a system performance parameter, and should be altered only by someone with a thorough understanding of RSX-11M-PLUS.

Default: SECONDARY\_POOL=0

### SET\_OPTIONS=ddnn,/switch1/switch2 ... /switchn

This statement sets terminal characteristics not included in the TERMINAL statement (for example, whether the terminal supports form feeds).

## PREGENERATED RSX-11M-PLUS KITS

Each SET OPTIONS statement in the configuration file must correspond to a TERMINAL statement. You may specify any number of switches for each SET\_OPTIONS statement.

The first argument (ddnn) is a terminal number corresponding to a TERMINAL statement already included in the configuration file. The second and subsequent arguments (/switch1/switch2.../switchn) may be any switch that may be used with the MCR command SET. For the second and each subsequent argument, the startup procedure issues a SET /TERM command. For example:

```
SET_OPTIONS=TT2,/FORMFEED/SLAVE
```

Including the above statements in the configuration file causes the startup procedure to issue the following MCR commands:

```
SET /FORMFEED=TT2:  
SET /SLAVE=TT2:
```

Note that the statement in the example was assumed to have been preceded in the configuration file by a TERMINAL statement also specifying TT2:. For example:

```
TERMINAL=TT2,LA120,FIXED,LOWER  
SET_OPTIONS=TT2,/FORMFEED/SLAVE
```

You may include any number of SET statements in the configuration file. Each SET statement sets additional characteristics for one terminal.

See the RSX-11M-PLUS MCR Operations Manual for a complete list of switches for the SET command. See also the description of the TERMINAL statement.

Default: No SET statements are included.

### **STARTFILE=filename**

This statement specifies a command file to be used as a secondary startup command file.

If you include this statement, the command file specified is invoked as a nested indirect command file, after the startup procedure has completed its normal steps. You can use this secondary command file to perform additional startup functions. If you do not wish to perform any additional startup functions, you may omit this statement, or specify STARTFILE=NONE.

You should include the full file specification (device, directory, and file name) for the secondary startup file.

See also the description of the CLI statement.

Default: STARTFILE=NONE

### **STEP\_DISPLAY=yes/no**

This statement controls whether the numbers and descriptions of the steps in the startup procedure are printed on the console terminal.

## PREGENERATED RSX-11M-PLUS KITS

For each major step it performs, the startup procedure can print none, some, or all of the following types of information:

Step n - Description of step  
          Explanatory text  
          Parameters from configuration file  
the actual command(s) used to perform the step

The following is an example of what the startup procedure could print on the system console for Step 3:

```
Step 3 - Allocating checkpoint space and secondary pool
          Allocating system controlled checkpoint space ...
          System checkpoint file size is 1024. blocks
          Secondary pool extension size is 0 bytes.
ACS SY:/BLKS=1024.
```

In the example, the line beginning "Step 3" is printed only if the configuration file contains the STEP\_DISPLAY=YES statement.

See also the descriptions of the COMMANDS, LONG\_TEXT, PARAMETERS, and QUIET statements.

Default: STEP\_DISPLAY=NO

### SYSTEM=string

This statement defines part of the text string printed by the startup procedure. The startup procedure prints an identification message in the following format:

```
`string' system startup procedure
```

In the preceding format example, `string' is the text following the equal sign in the statement.

Default: RSX-11M-PLUS

### TERMINAL=ddnn,type,speed,upper/lower

This statement sets terminal characteristics.

The startup procedure always attempts to identify each terminal connected to your RSX-11M-PLUS system. If the terminal can be identified and is a type supported by RSX-11M-PLUS, the appropriate terminal characteristics are set automatically. For each terminal that cannot be automatically identified (or for special applications in which you want terminal characteristics different from those issued automatically), though, you must include one TERMINAL statement in the configuration file.

In each TERMINAL statement, you must specify several arguments: The first argument (ddnn:) is the terminal number (for example, TT3). The second argument (type) is the terminal type (for example, VT100). You may specify any terminal type that is accepted by the MCR command SET. The third argument (speed) is the transmit/receive speed (for example, 9600) for the terminal if it is interfaced through a variable-speed multiplexer (DZ11, DZQ11, or DZV11) or FIXED if it is not. The fourth argument (upper/lower) is LOWER for terminals that support lowercase characters or NOLOWER for terminals that do not support lowercase characters.

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There may be any number of `TERMINAL` statements in the configuration file. Each `TERMINAL` statement sets the characteristics for one terminal.

You can set additional terminal characteristics using the `SET OPTIONS` statement. See the description of that statement for more information.

Default: `TERMINAL=TT0,LA120,FIXED,LOWER`

The following is a list of the statements contained in the configuration file (`[1,2]SYSPARAM.DAT`) that is supplied with your `RSX-11M-PLUS` system:

```
;DECNET=NO
DAPRES=NO
CONFIGURE=NONE
CON ONLINE ALL=YES
CHECKPOINT SPACE=512.
SECONDARY POOL=0
QUEUE MANAGER=YES
BATCH PROCESSORS=1.
STEP DISPLAY=YES
LONG TEXT=NO
COMMANDS=NO
PARAMETERS=YES
ERROR LOG=YES
ERROR SIZE=100
ERROR LIMIT=3
ERROR DISPLAY=NO
ACCOUNT FILES=2
STARTFILE=NONE
;DRIVER=LP:
;PRINTER=LP0,FORM:0,FLAG:1
;TERMINAL=TT1,LA50,Fixed,LOWER
;SET=TT1,/FORMFEED/NOBROADCAST
;PRINTER=TT1,FORM:0,FLAG:1
CLI=MCR
LOGOUT=YES
```

The statements preceded by a semicolon (;) are ignored by the system startup procedure. You can edit the configuration data file to remove the semicolons and activate these statements.

**5.4.1.3 Startup Procedure Error Messages** - If, while it is reading the configuration data file, `READCON.COMD` encounters an error in a statement included in the configuration data file, the startup procedure prints a message on the console terminal identifying the statement that contains the error. The message appears in the following format:

```
READCON -- [filespec] contains an invalid statement
           The invalid statement was:
           [text of the invalid statement]
           This statement was ignored.
```

In the preceding format example, 'filespec' is the file specification of the configuration data file.

If for some reason the configuration data file cannot be accessed, the startup procedure uses the default values for all statements.

**5.4.1.4 Troubleshooting Problems with the Startup Procedure** - In most cases, the system startup procedure can proceed in spite of errors or other problems and leave you with a system that can be used. If the system will not restart at all, see Chapter 4 for suggestions on what to do next.

This section describes some of the problems which may prevent the system from starting up completely or from having all features and devices included.

**5.4.1.4.1 Errors in the Configuration File** - If error messages from READCON appear on the console terminal in the course of system startup, the configuration file probably contains a faulty statement. Check the statement indicated by the error message against the descriptions in Section 5.4.1.2, correct the error, and try again.

A line in the configuration data file containing only a space character is interpreted as an invalid statement, so any blank lines in the configuration file should begin with a semicolon (;).

**5.4.1.4.2 Problems with Automatic Device Configuration** - For the automatic device configuration program in the system startup procedure to be able to properly identify the peripheral devices connected to your processor, those devices must be at DIGITAL-standard CSR and vector addresses. If you have a PDP-11 packaged system, your devices are probably at the standard CSR and vector addresses. If you are not sure about whether your system is configured properly, or if you are running RSX-11M-PLUS on another PDP-11 configuration, consult DIGITAL Field Service.

If, after the startup procedure has finished, you are unable to use a particular peripheral device connected to your system, you should check to see whether that device appears at the standard CSR and vector addresses. If it does not, you must connect the device to the standard CSR and vector addresses if you wish to use it with the pregenerated system.

As the automatic device configuration program identifies the devices in your system, it creates a file that the startup procedure uses to load the proper device drivers. If the automatic device configuration program encounters an error as it attempts to create this file, the program prints the following message:

```
ACF -- Fatal error occurred creating configuration file
```

If this message appears on your console terminal, check to see if the system disk is write-locked, or if it is full and there is no more free space available. Correct the problem by releasing the write-protect button on the disk drive, or by deleting some unneeded files from that disk.

#### **5.4.2 The Account File**

An account file is supplied on the kit disk. It contains two user accounts, one privileged and one nonprivileged:

```
UIC:           [1,1]
Account name:  SYSTEM
Password:     SYSTEM
```

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UIC: [200,1]  
Account name: USER  
Password: USER

To preserve the security of your system, you should change the passwords to these accounts as the first step in setting up an account file.

All new passwords in the account file are encrypted automatically; that is, the operating system uses an algorithm to scramble the passwords so that only the system is able to read them. If you are copying an account file from a previous version of RSX-11M-PLUS to this version, you can encrypt the passwords by either changing the passwords in the account file or by having the users issue the MCR command SET /PASSWORD (or DCL command SET PASSWORD) to change them. For more information on password encryption, see the RSX-11M/M-PLUS System Management Guide.

The [200,1] account is supplied for use in conjunction with the warm-up session presented in the Introduction to RSX-11M-PLUS.

See the RSX-11M/M-PLUS System Management Guide for information on using ACNT.

### 5.4.3 Login and Batch Job Message Files

When you log in, the system prints the login information file [1,2]LOGIN.TXT on your terminal. You should edit this file to provide installation news and notices to system users. See the description of the HEL/LOG command in the RSX-11M/M-PLUS MCR Operations Manual for information on the use of the LOGIN.TXT file.

If you intend to use the batch processor in your system, you should edit [1,2]BATCH.TXT, which is included at the beginning of each batch job log.

### 5.4.4 Login and Logout Command Files

When you log in on or log out of the system, RSX-11M-PLUS looks for certain command files. If it finds them, it executes the commands in those files. You can use these command files to set up a particular user environment every time an account is used.

5.4.4.1 **SYSLOGIN.CMD**, the System Login Command File - You can use the system login command file, [1,2]SYSLOGIN.CMD, to execute a set of commands each time you log in to the system. The system login command file provided with RSX-11M-PLUS does the followings things:

- Checks to see whether the terminal should be nonprivileged and issues the appropriate command
- Attempts to identify the terminal type and to set the appropriate terminal characteristics if the terminal is of a type supported on RSX-11M-PLUS

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- Checks to see whether the terminal should be unslaved and issues the appropriate command
- Chains to the user's login command file, if one exists

These actions should be sufficient for a large number of applications. If you don't need any further actions taken when all users log in, you needn't make any changes to SYSLOGIN.CMD.

**5.4.4.1.1 How SYSLOGIN.CMD Works** - When a user logs in on the system using the LOGIN (or HELLO) command, the last thing the system does in the login sequence is invoke LB:[1,2]SYSLOGIN.CMD, if it exists. (See the description of the HELLO command in the RSX-11M-PLUS MCR Operations Manual for a list of all the things the system does in the login sequence.) SYSLOGIN.CMD is invoked with privilege so that system-level operations can be performed, and slaved so that the user cannot prevent SYSLOGIN.CMD from executing.

When it invokes SYSLOGIN.CMD, the LOGIN command sets a CLI override bit so that SYSLOGIN.CMD can use system commands regardless of the CLI to which the terminal is set when SYSLOGIN.CMD is invoked. This bit overrides the current CLI and allows SYSLOGIN.CMD to use DCL commands (using the special MCR command DCL) as well as MCR commands. For example, the DIGITAL-supplied SYSLOGIN.CMD file sets the terminal unslaved using the following command line:

```
DCL SET TERMINAL/NOSLAVE
```

### NOTE

Commands sent to DCL are actually executed by MCR, the command dispatcher. When the CLI override bit is set, commands bypass DCL and go directly to MCR. The special DCL command identifies a command line as a DCL command so that MCR can execute the command properly. If you use any of MCR commands in your SYSLOGIN.CMD file, you should not precede them with the special DCL command. These commands are executed directly by MCR.

Before SYSLOGIN.CMD exits, it uses the CLI /UNOVR command to clear the override bit and to ensure that commands issued from the terminal go to the correct CLI.

The LOGIN command passes the following information to SYSLOGIN.CMD:

Default system device	(xxn:)
Login UIC	([g,m])
Last name	
First initial	
If terminal is to be privileged (P or NP)	
If terminal is to be slaved (S or NS)	
If terminal is TT, VT, or batch VT (T, V, or B)	
Account number	(nnnn)
Session ID	(xxx)

The information is available for use in SYSLOGIN.CMD as Indirect parameters P1 through P9, respectively.

## PREGENERATED RSX-11M-PLUS KITS

If SYSLOGIN.CMD exists, it must do the following:

- Check the appropriate parameter to see whether the terminal should be privileged or nonprivileged and set the terminal accordingly
- Check the appropriate parameter to see whether the terminal should be slaved or nonslaved and set the terminal accordingly (You must set a terminal's privilege status before its slave status or else a nonprivileged user could become privileged.)
- Issue the MCR command CLI /UNOVR to clear the override bit so that commands typed at the user's terminal are sent to the correct CLI (DCL or a CLI that you have written)

If SYSLOGIN.CMD does not exist, the system does the following:

- Checks the appropriate parameter to see whether the terminal should be privileged or nonprivileged and sets the terminal accordingly
- Checks the appropriate parameter to see whether the terminal should be slaved or nonslaved and sets the terminal accordingly
- Clears the CLI override bit
- Invokes the user's login command file, LOGIN.CMD, if it exists (The system looks for LOGIN.CMD using the user's default device and directory as indicated in the account file.)

**5.4.4.2 LOGIN.CMD, the User's Login Command File** - You can use the user login command file, LOGIN.CMD, to execute a set of commands each time a user logs in.

The system invokes the file LOGIN.CMD if it exists on the user's default device and directory as indicated in the account file. LOGIN.CMD is invoked either privileged or nonprivileged, depending on the status of the terminal as set by SYSLOGIN.CMD or the LOGIN command. The terminal is not slaved while LOGIN.CMD is executing.

**5.4.4.3 SYSLOGOUT.CMD, the System Logout Command File** - You can use the system logout command file, [1,2]SYSLOGOUT.CMD, to execute a set of commands for each user that logs out of the system. No system logout command file is supplied with RSX-11M-PLUS.

The system invokes SYSLOGOUT.CMD (if it exists) when the user logs out of the system using the LOGOUT command. It is invoked either privileged or nonprivileged, depending on the status of the terminal when the LOGOUT command is issued. Commands from SYSLOGOUT.CMD go to the CLI that is in effect when the LOGOUT command is issued. The terminal is slaved while SYSLOGOUT.CMD executes.

If SYSLOGOUT.CMD has not exited ten seconds after it is invoked by the LOGOUT command, the system aborts it. This prevents a faulty SYSLOGOUT.CMD file from leaving many terminals logged in on the system.

**5.4.4.4 LOGOUT.CMD, the User's Logout Command File** - You can use the user logout command file, LOGOUT.CMD, to execute a set of commands each time a user logs out.

The system invokes the file LOGOUT.CMD if it exists on the user's default device and directory as indicated in the account file. LOGOUT.CMD is invoked either privileged or nonprivileged, depending on the status of the terminal. The terminal is slaved while LOGOUT.CMD is executing.

If LOGOUT.CMD has not exited 10 seconds after it is invoked by the LOGOUT command, the system aborts it. This prevents a faulty LOGOUT.CMD file from leaving the terminal logged in on the system.

You could use LOGOUT.CMD to purge files and delete temporary files automatically each time a user logs out.

#### 5.4.5 Designing Your Own System Management Command Files

If you have studied the system management files provided with your RSX-11M-PLUS system, you've become familiar with how you can use system commands and Indirect directives to perform many repetitive system management duties. You can take almost any set of commands that you find yourself typing at a terminal day after day and put them in a command file, thus reducing your typing considerably. When you gain experience with using Indirect, you can write command files that prompt for yes/no answers or strings and take different paths based on those answers.

You can also write an indirect command file and place it so that it appears to be a new system command. If you give your command file a 3-letter file name and CMD file type, and place the file in directory [3,54] (the system library), it can be invoked by any user who types the 3-letter file name.

A simple example is the following command file, called WHO.CMD, which displays your terminal number and present default device and directory.

```

.; WHO. CMD
.;
.; Prints terminal number, device, and directory

.ENABLE SUBSTITUTION
.DISABLE DISPLAY
.TESTFILE TI:
.TEST<FILSPC>
.SETS TI <FILSPC>[1:<STRLEN>]
;
; Terminal 'TI' is at ' <SYDISK>' '<SYUNIT>': '<UIC>'
;

```

Here is an example of what you would see on your terminal if you invoked WHO.CMD:

```

$ who (RET)
$
$ Terminal TT2: is at DU0:[1,10]
$
$

```

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This is a fast and easy way of creating new system commands, but it has one restriction: if a user has a file in his default directory with the same name as the file you have placed in the system library, RSX-11M-PLUS invokes the user's file and not the one in the system library. For an explanation of why this happens, see the TDX and CATCHALL.COMD descriptions in the RSX-11M-PLUS Release Notes.

### 5.4.6 Modifying On-Line Help Files

RSX-11M-PLUS has on-line help text available for all commands and most features. Users can obtain help using the HELP command, which is explained in Chapter 3 the RSX-11M-PLUS Command Language Manual.

You can augment the DIGITAL-supplied help files with information specific to your system or application. This section explains how the RSX-11M-PLUS system help files are arranged and provides some examples of adding your own files. Before you read any further in this section, you should study the HELP command description and the help file format in Chapter 3 of the RSX-11M-PLUS Command Language Manual.

**5.4.6.1 How the Help Files are Set Up** - Before you read this section, read Chapter 3 of the RSX-11M-PLUS Command Language Manual for more information on the help file format and on terms used in this section. You should also print a copy of LB:[1,2]DCL.HLP to look at as you read the descriptions that follow.

All the RSX-11M-PLUS help files are contained in directory [1,2], and carry the file type .HLP. They are controlled by the root file, DCL.HLP.

The text in the beginning of DCL.HLP is printed when the HELP command is typed without an argument. The rest of the root file contains numbered parameters, indirect file references, and synonym statements. To determine which of the help files is referenced when a particular parameter is specified, search through the root file to find that parameter, then refer to the specific help file referenced. For example, to find the name of the help file containing information on the BACKUP command, look through the root file until you find the following lines:

```
1 BACKUP
@DCLBACKUP
```

These lines indicate that information on the BACKUP command is contained in the file [1,2]DCLBACKUP.HLP.

**5.4.6.2 Creating Your Own Help Files** - You can add help files to your RSX-11M-PLUS system simply by preparing a text file that follows the format rules in Chapter 3 of the RSX-11M-PLUS Command Language Manual and adding the appropriate parameter name to the root file. You can insert the parameter name at any point in the file, but for the sake of organization and easy transfer to new versions of RSX-11M-PLUS, you should put the parameter names you add at the top of the root file, just after the DCL commands help text.

As an example, here is a portion of a help root file for an RSX-11M-PLUS system. The added help files were placed in directory [1,2] and named with the file type .HLP. The parameters added to the DIGITAL-supplied root file are printed in red ink.

·  
·  
·

For information on a command, type HELP commandname. Additional help on a command qualifier is often available by typing HELP commandname qualifier. For the short forms of some commands, type HELP BRIEF.

```

1 TERMINALS
@TERMINALS
1 TTY
TERMINALS
1 USERS
TERMINALS
1 SYSTEM
@SYSHLP
1 CHANGES
@CHANGES.DAT
1 MFT
DTE
1 FILE_TRANSFER_UTILITY
DTE
1 DATA_TERMINAL_EMULATION
DTE
1 DTE
@DTE
1 FORTRAN
@FORTRAN
1 DATATRIEVE
@DTRV
1 PASCAL
@PASCAL
1 DIBOL
@DIBOL
1 COBOL
@DCLC81
1 BASIC
@DCLBAS
1 DECTYPE
@DECTYPE
1 RSX_OFIS
ROS
1 OFIS
ROS
1 ROS
@dclros
1 ABORT
@dclabort

```

·  
·  
·

When you add your own systemwide help parameters, you should also add them to the system features help page (accessed by typing HELP MORE). Here is another section of the same root file shown in the previous example:

```

1 UNLOAD
@UNL
1 UNLOCK
@dclunlock
1 MORE

```

Help is available for the following utilities and system features. Type HELP topic for additional information.

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-----  
RMS-11 (Record Management Services for the PDP-11) Utilities:

BCK	CNV	DES	DSP	IFL	RST	RMS
-----	-----	-----	-----	-----	-----	-----

-----  
Utilities:

BAD	BRU	CMP	DMP	DSC	EDI	FLX
FMT	LBR	MFT	PAT	PIP	SLP	VFY
ZAP						

-----  
Other topics:

ASCII	BATCH	DTE	EXECUTIVE	FCS	IOX
INDIRECT	SYSLIB	MAG	ODT	PMD	SYSLIB

Information on this system:

SYSTEM	TERMINALS	CHANGES
1 @OPTION		
@OPTION		
1 @BACKUP		
@BACKUP		
1 FCS		
@FCS		

.  
.  
.

If your application requires that only certain groups of users have access to a set of application help files, you can create your own root help file and have users access it using the /GROUP qualifier to the HELP command. Likewise, you can restrict help file access to a single account by using the /LOCAL qualifier. See Chapter 3 of the RSX-11M/M-PLUS MCR Operations Manual for information on these qualifiers.

### 5.4.7 Installing the RMS-11 Tasks, Utilities, and Libraries

RMS-11 Version 2.0 is included on the pregenerated kit disk. The RMS-11 segmented library (RMSRES, and RMSLBA through RMSLBF) and all the RMS-11 utilities are already installed in the system image. No further installation is needed, unless you install DECnet on your system and you want to use the RMS-11 remote access facilities. See Section 5.4.1 for information on installing the RMS-11 remote access package (DAPRES).

For more information on RMS-11, see the RSX-11M-PLUS Release Notes and RMS-11: An Introduction.

### 5.4.8 Installing and Using System Tasks

The system disk contains the standard complement of privileged system tasks. Many of the system tasks are already installed in the pregenerated system image.

The file SYSVMR.COM in [1,54] or [2,54] contains the commands that were used to install tasks in the pregenerated system.

Many of the nonprivileged system tasks are supplied in "xxxFSL.TSK" and "xxxRES.TSK" versions. These tasks reside in directory [3,54] on the kit disk.

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When you use the DELETESYS.COMD procedure to delete an unused system, the system tasks associated with the unused system are also deleted. When you delete the [1,54] system, the tasks of the form "xxxRES.TSK" are deleted; when you delete the [2,54] system, the tasks of the form "xxxFSL.TSK" are deleted.

Tasks with names of the form "xxxFSL.TSK" are built to link to FCSFSL, the FCS supervisor-mode library. If you are using the [2,54] system, you should use these tasks.

Tasks with names of the form "xxxRES.TSK" are built to link to FCSRES, the FCS resident library. If you are using the [1,54] system, you should use these tasks.

The system library [1,1]SYSLIB.OLB also contains ANSI-compatible FCS routines. Tasks that cannot link to FCSRES can be built with these FCS routines in their task images.

A library of non-ANSI FCS routines, [1,1]NOANSLIB.OLB, is also provided for building tasks that do not require ANSI support. A task built to link to this library is smaller than the same task built to link to the system library, yet retains full FCS software features.

### 5.4.9 Installing Layered Products

If you intend to include any DIGITAL layered products in your system, see the appropriate layered product installation documentation for specific instructions.

### 5.4.10 Installing Other Device Drivers

If you wish to use devices for which a device driver is not already loaded in the system, you must load the appropriate device driver.

Since the Executive is pregenerated, thus making it impossible to incorporate resident drivers, all drivers and data bases in this system are loadable. This feature saves pool space and makes it possible for you to load only the drivers you need into the system image. Note, however, that once they are loaded, data bases cannot be unloaded without rebootsrapping the system (or, if the data base was loaded using VMR, without re-creating the system image with VMR).

All the device drivers supplied have been built to load into the DRVPAR partition. The size of DRVPAR, however, is sufficient only for the drivers that are supplied loaded into the system (see Section 5.5.2.2 for a list of these drivers). If you use the MCR command LOA to load additional drivers, the system returns the "Partition DRVPAR too small" error message.

When you use the DRIVER statement in the configuration file to load an auxiliary driver, the system startup procedure loads the driver in the GEN partition.

If you wish to load a driver by hand, you can load the driver into the GEN partition using the following command line:

```
LOA xx:/PAR=GEN
```

## 5.5 USING THE SYSTEM

Your RSX-11M-PLUS system is now ready for use.

You should consider making a backup copy of the system disk so that you will be able to recover quickly from any accidental corruption of your system disk, without having to make a new copy from the DIGITAL-supplied kit disk and repeating the setup procedures detailed in the previous sections. You can make a hardware-bootstrappable copy of your system disk quickly and easily using the Backup and Restore Utility (BRU). Chapter 7 of the RSX-11M/M-PLUS Utilities Manual provides a description of BRU, along with examples of making backup copies of system disks.

### 5.5.1 Finding Out More About the System

If you are not already familiar with RSX-11M-PLUS, you should read the Introduction to RSX-11M-PLUS and perform the on-line terminal session.

If you are to be the manager of this system, you should read the RSX-11M/M-PLUS System Management Guide to become familiar with the system management utilities you will need to use.

The quickest way to find information on a specific subject is to use the Master Index contained in the RSX-11M-PLUS Information Directory and Master Index. The Master Index consists of all the individual manual indexes merged into a comprehensive reference to the entire documentation set.

### 5.5.2 Detailed Description of Pregenerated Executive Features

This section contains detailed descriptions of the features and limitations of the pregenerated systems.

**5.5.2.1 Features of the Pregenerated Systems** - The pregenerated systems provide many of the Executive and system features available on the full RSX-11M-PLUS distribution kits, without requiring you to perform a system generation before using your system.

The following is a list of the Executive options, support, and system parameter values included in both the [1,54] and the [2,54] systems:

- Task headers out-of-pool
- Extended logical name support
- Fast map facility
- ICB pool size = 128(decimal) words
- DECnet
- LAT terminal server support
- Disk data caching
- Resource Accounting
- QMG and batch processor

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- CTRL/C abort support
- FCP = FCPLRG
- File windows in secondary pool
- Decimal version numbers in file specifications
- Default virtual terminal unit buffer size = 120(decimal)
- Maximum virtual terminal unit buffer size = 184(decimal)
- Character translation support
- Unsolicited input time-out = 30(decimal) seconds
- IP11 industrial I/O subsystem support including powerfail support (Note that the IP11 industrial I/O subsystem must be purchased separately.)
- Crash notification device CSR address = 177564
- Floating point processor
- Nonprogrammable system clock

The following is a list of Executive features included in the [2,54] system but not included in the [1,54] system:

- Executive data space support
- User data space support
- Shadow recording
- Console logging

The [2,54] system has system tasks built to link to FCSFSL, the FCS supervisor-mode library.

The [1,54] system has system tasks built to link to FCSRES, the FCS resident library.

**5.5.2.2 Hardware Supported** - The following loadable drivers are already loaded in the pregenerated systems provided on the kit disk:

DL RL02 driver  
TT Terminal driver  
VT Virtual terminal driver  
RD Reconfiguration driver  
NL Null device driver

The following loadable drivers are included on the pregenerated system kit disk, but they are not loaded into the pregenerated systems:

DD TU58 driver  
DX RX01 driver  
DY RX02 driver  
DU RA60, RA80, RA81, RC25, RX50/RD51/RD52/RD53 driver  
MS TSV05, TS11, TU80 driver  
MU TK50 driver  
LP Line printer driver  
LA LPAll-K driver  
XE DEUNA Ethernet driver

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If you wish to use any of the drivers that are not already loaded into your system, you must load them yourself. You can do this easily using the DRIVER statement in the system startup procedure. See Section 5.4.1 for information on using the startup procedure to load drivers. See also Section 5.4.10 for restrictions on adding drivers.

### NOTE

If the DU driver is loaded, the RCT task must be installed. See the RSX-11M-PLUS System Management Guide for more information on the RCT task.

Because source code of the drivers or their data bases is not included in the pregenerated system kit, you cannot change the device configuration by any of the standard methods. To provide support for a wide variety of terminal configurations, the pregenerated system kit contains an autoconfiguration task that determines what kinds of terminal interfaces are connected to the UNIBUS or LSI-11 bus and then generates data bases for them. The autoconfiguration task is invoked by the system startup procedure.

The autoconfiguration task finds all the terminal interfaces connected to your processor (DL11/DLV11 and DZ11/DZQ11/DZV11 interfaces). To add a user-supplied driver for any of these interfaces, load the driver and its data base using VMR, or use the CONFIGURE statement in the system startup procedure to invoke a command file that loads the user-supplied driver and its data base before the autoconfiguration task is run. The autoconfiguration task ignores any interfaces it finds that are already represented by a data base.

The autoconfiguration task matches terminal interfaces it finds against data bases by checking whether the CSR address contained in offset K.CSR is the same as the CSR of the respective interface. Thus, you must establish the proper value for K.CSR in the driver data base source code for user-supplied device drivers.

The autoconfiguration task also determines the line frequency (60 or 50 Hz) and sets the proper number of clock ticks/second.

**5.5.2.3 Restrictions** - Certain restrictions and limitations apply to the pregenerated RSX-11M-PLUS system.

- The pregenerated system includes two RSX-11M-PLUS operating systems. The first runs on processors that support Executive data space, user data space, and supervisor-mode libraries. This system resides in directory [2,54] on the kit disk, and is referred to in this chapter as "the [2,54] system." The second system runs on processors that do not include instruction- and data-space hardware. This system resides in directory [1,54] on the kit disk, and is referred to in this chapter as "the [1,54] system." The [1,54] system as supplied on the kit disk is hardware-bootstrappable.

After copying the kit disk and bootstrapping the system appropriate for your processor, you can delete the files for the system that you are not using to gain more disk space for your own applications.

- On the [1,54] system, pool space is more limited than on the [2,54] system.

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- The [1,54] system does not include supervisor-mode library support, and so the "xxxFSL.TSK" versions of tasks, which link to supervisor-mode FCS libraries, cannot be run.
- The [1,54] system does not include support for shadow recording, console logging, or software correction or logging of memory parity errors.
- The startup procedure verifies that the system is working properly and prints a confirmation message each time the system is bootstrapped.
- The Executive source files and object libraries are not included, nor are assembly and task-build command files used for reassembling or retaskbuilding any of the system components.
- Because Executive source files are not provided, patching is not possible, nor can the normal Update procedure be used to apply the latest corrections to the pregenerated system kit. Updates issued for the pregenerated system kit consist of entirely new RSX-11M-PLUS systems, which have been updated and rebuilt.
- The device configuration is limited to the following device types, number of controllers, and number of units:

Device Type	Number of Controllers	Number of Units
DD	1	2
DL	4	4
DU	4	4
DX	1	2
DY	1	2
LA	1	1
LP	1	1
MS	1	1
MU	2	2
XE	1	1

Many of the nonprivileged system tasks are supplied in xxxFSL.TSK and xxxRES.TSK versions. These tasks reside in directory [3,54] on the kit disk.

If you are using the [2,54] system, you should use the xxxFSL.TSK tasks.

If you are using the [1,54] system, you should use the xxxRES.TSK tasks.

- The Error Logging universal libraries provided on the kit disk ([1,6]ERRLOG.ULB and ERRLOGETC.ULB) have been "tuned" to suit the complement of devices configured into the pregenerated systems.
- The SYSGEN procedure is not included or necessary.

### 5.6 CHANGING YOUR SYSTEM

While you cannot modify the features of your RSX-11M-PLUS Executive, you can alter certain aspects of your system. This section provides information on the changes you can make and what you must know to make them.

### 5.6.1 Recovering Additional Disk Space

As you use the pregenerated system, you may find that there are several files on the disk you never use. These unused files may be deleted from the system disk to make more disk space available for your tasks and applications. Should you at some point in the future have a need for files you have deleted, you can copy them from the original kit disk.

### 5.6.2 Changing the Crash Dump Device

You can use the MCR command SET /CRASH\_DEVICE to set or change the crash device in the presently running system. For example, to change the crash device to DL1: in the running system, use the following MCR command line:

```
>SET /CRASH_DEVICE=DL1: RET
```

You can put this command in an auxiliary startup command file so that it will be issued each time the system is started.

#### NOTE

The MCR command SET /CRASH\_DEVICE allows you to specify only DL-, DU-, MS-, and MU-type devices as the system crash device. If you specify the system disk as a crash device, the following message are displayed:

```
SET -- Warning, System disk chosen as crash device
SET -- Crash device <ddnn:> has been succesfully
loaded
```

You should not specify a fixed-media device, (for example, the RD51 fixed disk) as the crash device. If you do and then try to get a crash dump, you will receive an error message saying that the specified device is an illegal crash device. At that point, you will not be able to get a crash dump.

For more information on the MCR command SET /CRASH DEVICE, see the RSX-11M/M-PLUS MCR Operations Manual.

### 5.6.3 K-Series Laboratory Peripherals and LPA11-K Controller

To enable you to generate K-Series support routines, directory [200,200] on the kit disk contains the indirect command file SGNKLAB.CMD. For information on invoking and using this file, see the RSX-11M/M-PLUS I/O Drivers Reference Manual.

Also included in [200,200] is the indirect command file BLDLAINIT.CMD. This file is used to generate support routines for the LPA11-K Laboratory Peripheral Accelerator. To generate the routines, invoke the command file using the following command line:

```
@[200,200]BLDLAINIT
```

If your system does not have K-Series peripherals or an LPA11-K controller, you may delete the contents of directory [200,200].

For additional information on K-Series devices and the LPA11-K controller, see the RSX-11M/M-PLUS I/O Drivers Reference Manual.

#### 5.6.4 DECnet Pool Use

The pregenerated system image includes memory space reserved for installing the DECnet Communications Executive (CEX). If you do not intend to install DECnet on your system, the portion of memory that is reserved for installing CEX is not needed and can be deallocated, thereby increasing the size of pool.

If you do not intend to install DECnet on your system, you should edit the startup configuration file and change the DECNET statement to read DECNET=NO. See Section 5.4.1 for more information on the system startup procedure and the DECNET statement.

#### 5.6.5 DECnet Interface Modification

The [1,54]RSXMC.MAC symbol definition file supplied on the kit disk defines the processor type as a PDP-11/23-PLUS. The [2,54]RSXMC.MAC file supplied on the kit disk defines the processor type as a PDP-11/44.

The DECnet NETGEN procedure uses RSXMC.MAC to obtain system configuration parameters. Therefore, if the processor type listed in RSXMC.MAC is a PDP-11/23-PLUS, only LSI-11 bus-compatible devices are allowed for the DECnet interface.

If you are performing a DECnet NETGEN and you intend to use the [1,54] system on a processor other than the PDP-11/23-PLUS, MicroPDP-11/23, MicroPDP-11/73, or MicroPDP-11/83, you must alter the value of the symbol R\$\$TPR in [1,54]RSXMC.MAC before you start the NETGEN, so that UNIBUS-compatible devices may be used for the DECnet interface.

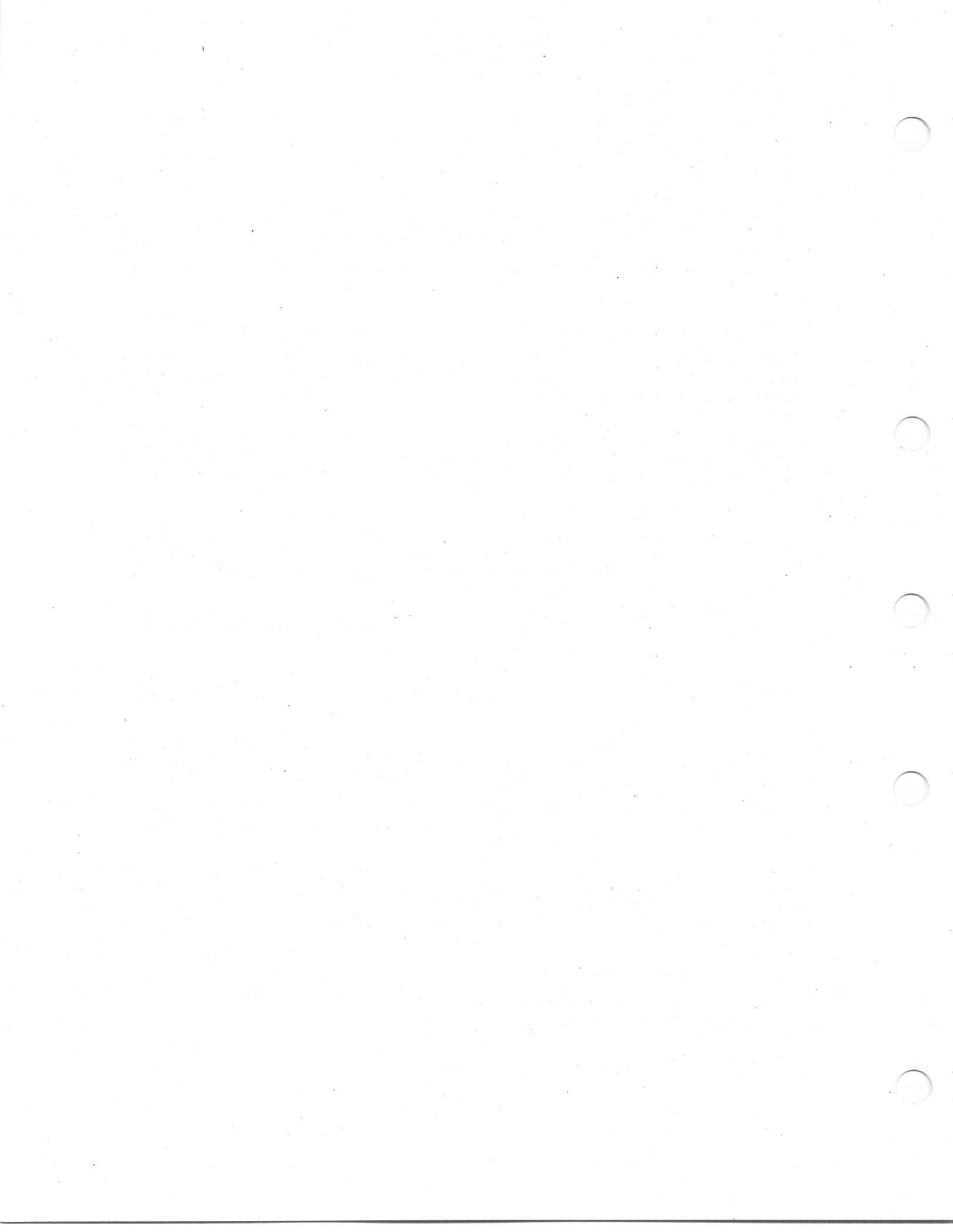
For example, if you are running the [1,54] system on a PDP-11/24 processor, you must alter the following line in [1,54]RSXMC.MAC:

```
R$$TPR="23
```

Use an editor to change the line to read:

```
R$$TPR="24
```

Likewise, if you intend to run the [2,54] system on a processor with a LSI-11 bus, you must alter the value of the symbol R\$\$TPR in [2,54]RSXMC.MAC before you start the NETGEN. Doing so allows the LSI-11 bus-compatible devices to be used for the DECnet interface.



APPENDIX A  
CONFIGURATION WORKSHEETS

During the Choosing Executive Options (CE) and Choosing Peripheral Configuration (CP) sections, SYSGEN asks a series of questions about the target system's Executive options and peripheral devices. You should gather the data SYSGEN requires before you begin the system generation procedure. This appendix contains a series of worksheets that aid in collecting and organizing the necessary information.

You should make copies of the worksheets and fill them out as you read through Chapter 3 of this manual. Files containing copies of the worksheets are located in directory [200,200] on the distribution kit.

The worksheets and their file names are as follows:

WRKEXECOP.TXT	Executive and processor options worksheet, which describes the various RSX-11M-PLUS Executive and processor options about which SYSGEN asks questions
WRKMASSCO.TXT	MASSBUS controller configuration worksheet, which describes the configuration of the MASSBUS controllers
WRKMASSDR.TXT	MASSBUS drive configuration worksheet, which describes the MASSBUS disk and magnetic tape drives
WRKUNIBCO.TXT	UNIBUS controller configuration worksheet, which describes the configuration of the controllers attached to the UNIBUS
WRKUNIBDR.TXT	UNIBUS drive configuration worksheet, which describes the configuration of the UNIBUS devices

Each worksheet contains a title, spaces for the name of the target system, the name of the person filling out the sheet, and the date. Because you may need more than one copy of some of the worksheets, spaces are provided for numbering those sheets.

At the bottom of each worksheet is a sample line that illustrates how to fill in each space.

Be sure to have the completed worksheets on hand as you begin the system generation procedure.

CONFIGURATION WORKSHEETS

EXECUTIVE AND PROCESSOR OPTIONS

System: \_\_\_\_\_

Author: \_\_\_\_\_

Date: \_\_\_\_\_

Page: 1 of 3

Always print long explanation: Yes No

Saved answer file for Executive: Yes No

Executive saved answer file name: \_\_\_\_\_

Saved answer file for peripherals: Yes No

Peripherals saved answer file name: \_\_\_\_\_

Saved answer file for nonprivileged task builds: Yes No

Nonprivileged task-build saved answer file name: \_\_\_\_\_

Is this a PREPGEN: Yes No

Disk drive containing target system disk: \_\_\_\_\_

Autoconfigure host system: Yes No

Override Autoconfigure results: Yes No

Processor type: \_\_\_\_\_

Full-functionality Executive: Yes No

Executive data space support: Yes No

User data space support: Yes No

Task headers out-of-pool support: Yes No

(Continued on next page)

CONFIGURATION WORKSHEETS

EXECUTIVE AND PROCESSOR OPTIONS

System: \_\_\_\_\_

Author: \_\_\_\_\_

Date: \_\_\_\_\_

Page: 2 of 3

Extended logical name support:	Yes	No
Supervisor-mode library support:	Yes	No
FCS resident library support:	Yes	No
Fast map support:	Yes	No
Loadable drivers/data bases:	Yes	No
ICB pool size:		(decimal words)
	_____	
Communications products support:	Yes	No
Host support for LAT servers:	Yes	No
System name:		(up to 6 chars)
	_____	
Shadow recording support:	Yes	No
Disk data caching support:	Yes	No
Console driver support:	Yes	No
Accounting support:	Yes	No
Batch processor:	Yes	No
Queue Manager:	Yes	No
DCL/alternate CLI support:	Yes	No
CTRL/C abort support:	Yes	No
FCP type:	FCPLRG	FCPMDL
File windows in secondary pool:	Yes	No
Decimal version numbers:	Yes	No

(Continued on next page)

CONFIGURATION WORKSHEETS

EXECUTIVE AND PROCESSOR OPTIONS

System: \_\_\_\_\_

Author: \_\_\_\_\_

Date: \_\_\_\_\_

Page: 3 of 3

Virtual terminal support: Yes No

Default virtual terminal  
unit buffer size: \_\_\_\_\_

Maximum virtual terminal  
unit buffer size: \_\_\_\_\_

Character translation support: Yes No

Terminal driver extended I/O support: Yes No

Unsolicited terminal input time-out: \_\_\_\_\_

IP11 industrial I/O subsystem support: Yes No

IP11 power fail support: Yes No

Executive Debugging Tool (XDT) support: Yes No

Crash notification device CSR address: \_\_\_\_\_

Crash device and unit: \_\_\_\_\_

Total system memory: \_\_\_\_\_ (in K words)

Floating point processor support: Yes No

Programmable system clock: Yes No

Interrupts per second: \_\_\_\_\_

50 Hz power: Yes No

CONFIGURATION WORKSHEETS

MASSBUS CONTROLLER CONFIGURATION

System: \_\_\_\_\_

Author: \_\_\_\_\_

Date: \_\_\_\_\_

Mixed MASSBUS:    Yes    No

Name	Device Type	---Configuration---	
		Vector	CSR
RHA	_____	_____	_____
RHB	_____	_____	_____
RHC	_____	_____	_____
RHD	_____	_____	_____

Example:

RHC	DB	254	176700
	_____	_____	_____







**APPENDIX B**  
**RSX-11M-PLUS DEVICES**

This appendix contains tables of RSX-11M-PLUS devices. Table B-1 lists for each device the device mnemonic, the respective device controller mnemonic, the controller and device names, and the generic description of each device. Pseudo devices are listed in Table B-2.

The manner in which the controller and device names are listed indicates which controllers can be used with which devices. For example:

RH11/RH70	RM02
RH70	RM03
	RM05
	RM80
	RP07

The above entries indicate that the RM02 can be used with either an RH11 or RH70 controller, but the RM03, RM05, RM80, and RP07 can be used only with an RH70 controller.

Table B-1  
RSX-11M-PLUS Devices

Device Mnemonic	Controller Mnemonic	Controller Name	Device Type	Device Description
CR	CR	CM11 CR11		Card reader
CT	CT	TA11	TU60	Cassette tape
DB	RH	RH11/RH70	RP04 RP05 RP06	Disk
DD	DD	DL11	TU58	DECtape II
DK	DK	RK11	RK05 RK05F	Disk
DL	DL	RL11/RLV11	RL01 RL02	Disk
DM	DM	RK611/RK711	RK06 RK07	Disk

(Continued on next page)

RSX-11M-PLUS DEVICES

Table B-1 (Cont.)  
RSX-11M-PLUS Devices

Device Mnemonic	Controller Mnemonic	Controller Name	Device Type	Device Description
DP	DP	RP11	RP02 RPR02 RP03	Disk
DR	RH	RH11/RH70 RH70	RM02 RM03 RM05 RM80 RP07	Disk
DS	RH	RH11/RH70	RS03 RS04	Disk
DT	DT	TC11	TU56	DEctape
DU	DU	RQDX1/RQDX2 RQDX3	RX50 RD51 RD52 RD53	Diskette Disk
		RUX50	RX50	Diskette
		KDA50/UDA50	RA60 RA80 RA81	Disk
		RQC25/RUC25	RC25	Disk
DX	DX	RX11	RX01	Diskette
DY	DY	RX211/RXV21	RX02	Diskette
EM	RH	RH11/RH70	ML11	Semiconductor disk emulator
LA	LA	LPA11		Lab peripheral accelerator
LP	LP	LA180 LN01 LP11	LA180 LN01 LP01 LP02 LP04 LP05 LP06 LP07 LP14 LP25 LP26 LP27 LS11 LV01	Printer
		LS11 LV11		

(Continued on next page)

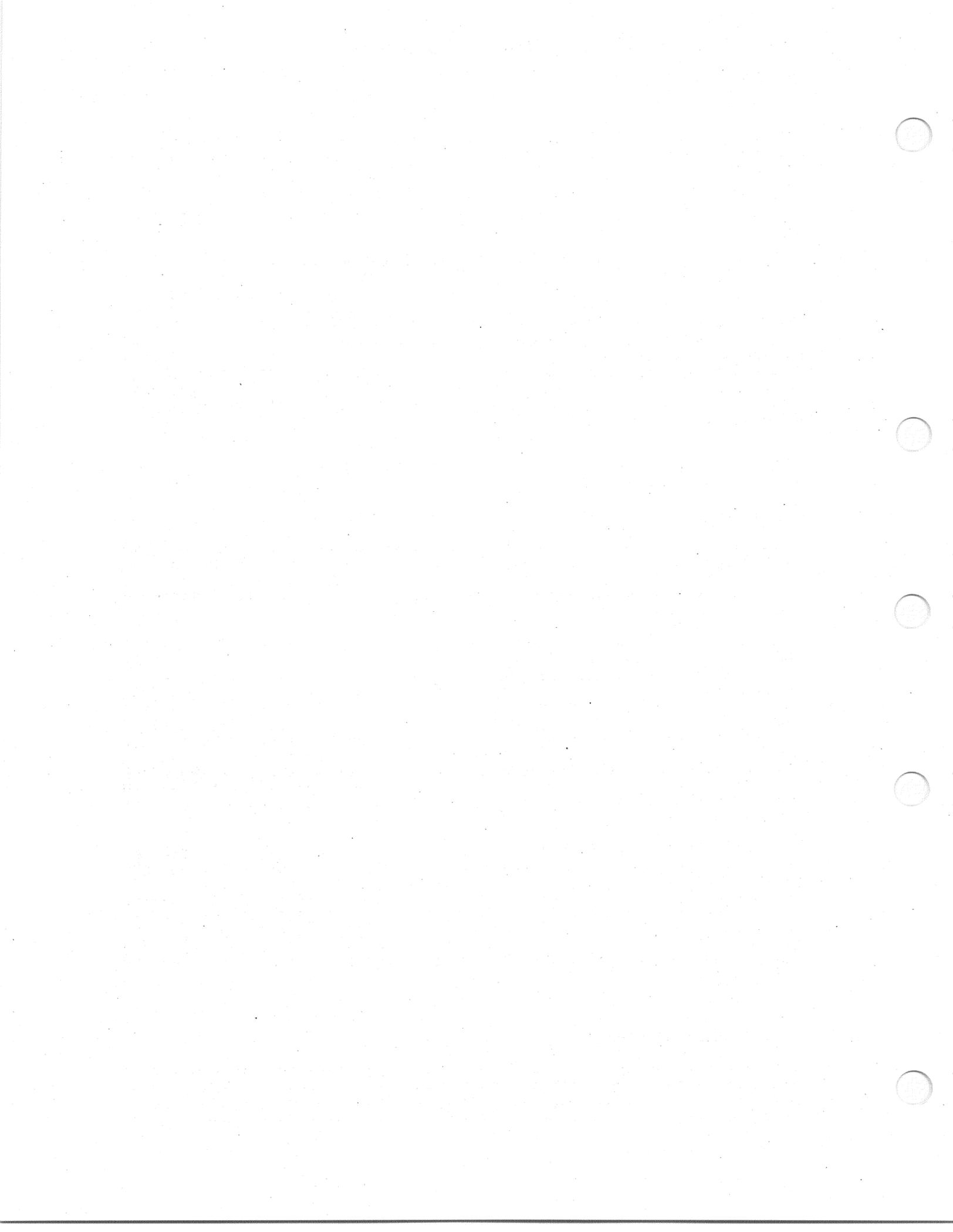
RSX-11M-PLUS DEVICES

Table B-1 (Cont.)  
RSX-11M-PLUS Devices

Device Mnemonic	Controller Mnemonic	Controller Name	Device Type	Device Description
LR	LR	PCL11		Parallel communications link (receiver)
LT	LT	PCL11		Parallel communications link (transmitter)
MM	RH	RH11/RH70 (with TM02/TM03 formatter)	TU16 TE16 TU45 TU77	Magnetic tape
MS	MS		TS11 TSV05 TU80 TK25	Magnetic tape  Magnetic tape cartridge
MT	MT	TM11/TMA11/TMB11	TE10 TU10 TU10W TS03	Magnetic tape
MU	MU		TK50	Magnetic tape cartridge
PP	PP	PC11		Paper tape reader and punch
PR	PR	PR11		Paper tape reader
TT	YL YH YJ YV YZ	DL11/DLV11 DH11 DJ11 DHU11/DHV11 DZ11/DZQ11/DZV11		Terminal interface
XE	XE	DEUNA		Communications interface
XM	XM	DMC11 DMR11		Synchronous interface
XW	XW	DUP11		Synchronous interface

Table B-2  
RSX-11M-PLUS Pseudo Devices

Pseudo Devices	Device Description
CL	Console listing device
CO	Console output device
LB	Library device
NL	Null device
RD	Reconfiguration driver
SP	Spooling device
SY	Default system device
TI	Terminal input device
VT	Virtual terminal



## APPENDIX C

### GENERAL FEATURES AND SYSTEM TUNING

This appendix provides you with some basic information on the RSX-11M-PLUS system. Although it is not necessary to perform a system generation, it is useful in helping you to make better decisions regarding the system features you choose. The topics covered here will help you understand the interaction of various system components and will help you optimize your system's operation after a system generation.

#### C.1 GENERAL SYSTEM FEATURES

##### C.1.1 Memory Partitions

Partitions are contiguous areas of physical memory that are managed and dynamically allocated to tasks by the Executive. All partitions in RSX-11M-PLUS are system-controlled. As many tasks as will fit are allowed to run simultaneously in a partition. Tasks are allocated a contiguous area in the partition.

Each time a task is activated, it is merged into a priority-ordered queue of tasks waiting to be loaded into the partition. To allocate the partition (disregarding checkpointing), the Executive examines the current state of the partition to determine whether there is enough contiguous space to load the highest-priority task currently in the partition wait queue. To do this, the Executive examines a list of allocated areas in the partition and calculates the size of the gaps that exist between allocated areas. The list of allocated areas is ordered by physical memory address, which allows a simple computation of gap size. The first gap that is big enough is allocated to the task, and its Partition Control Block (PCB) is merged into the list of allocated areas.

If a big enough gap cannot be found, the Executive attempts to fit the task into the partition by checkpointing neighboring stopped tasks and tasks of lower priority. If the task cannot be brought in by checkpointing, then the Executive requests the shuffler task. Checkpointing and shuffling in system-controlled partitions is discussed later in this appendix. Each time a task exits and frees memory in the partition, the Executive examines the partition wait queue and tries to allocate memory to the highest-priority waiting task.

##### C.1.2 Checkpointing

RSX-11M-PLUS supports checkpointing. Its objective is to preempt a lower-priority task when a higher-priority task can be brought in to make use of the freed memory. This optimizes the use of system resources while maintaining a priority-scheduling discipline.

## GENERAL FEATURES AND SYSTEM TUNING

Checkpointing in a partition occurs as the result of a memory allocation failure. That is, the Executive tries to allocate a contiguous area of a partition to a task, and it cannot find an unoccupied memory area of sufficient size. In this case, the Executive reexamines the list of allocated areas in the partition to determine whether it can form a free space of sufficient size by checkpointing one or more neighboring tasks. Each task considered for checkpointing must be of a lower priority, it must be checkpointable, and it must have checkpointing enabled.

The Executive scans the list from the beginning, looking for a series of neighboring tasks (possibly separated by gaps of free space), where each task satisfies the checkpoint criteria. If the aggregate sum of the memory occupied by such a series of tasks and free space satisfies the memory requirement for the higher-priority task, the tasks are checkpointed and the higher-priority task is allocated the released memory. If such a series of neighboring tasks cannot be found, the Executive calls the shuffler task to try to bring in the highest-priority waiting task. The shuffler task does this by compacting memory and checkpointing a sufficient number of lower-priority tasks that are not necessarily neighbors in the partition.

### C.1.3 Memory Compaction

The shuffler is a privileged task designed to compact space in a partition when a memory allocation failure occurs. For a complete description and discussion of the shuffler, see the RSX-11M/M-PLUS System Management Guide.

### C.1.4 Disk Swapping

Disk swapping allows tasks of equal (or close) priority to share a portion of memory, when such tasks cannot be loaded simultaneously. Swapping is accomplished by varying task priorities so that tasks of equal (or close) priority checkpoint each other periodically.

Swapping does not affect the checkpointing algorithm. For example, a task can only checkpoint another task of lower priority, never one of equal or higher priority. When swapping is enabled, however, the priority of tasks resident in memory, with respect only to the allocation of memory, varies with time. The task's priority with respect to all the other system resources does not change.

There are two parameters that control the swapping algorithm:

Swapping interval	This parameter determines how often the Executive scans the partition lists to modify the memory priority of resident tasks. A typical swapping interval might be about one-half second.
Swapping priority range	This is the absolute value of the range through which a task's priority varies from its installed priority. A typical value is 5. This value would cause a task's memory priority to vary from P+5 to P-5, where P is the priority set for the task when it was installed.

## GENERAL FEATURES AND SYSTEM TUNING

### NOTE

These parameters are set by commands in the SYSVMR command file and can be changed by using the MCR or VMR command SET.

The key element of the swapping algorithm is a byte in the task's header in which the swapping priority of the task is maintained. In a system employing swapping, the Executive determines whether a nonresident task should checkpoint a resident task by comparing the running priority of the nonresident task with the sum of the running and swapping priorities of the resident task. Each time a task is read into memory as the result of an initial task load or checkpoint read, the swapping priority byte in the task header is initialized. At each swapping interval, the swapping priority of each resident task is reduced by 1 until it reaches its lowest priority. If there is a possibility that checkpointing within a main partition might occur based on the new priorities, the Executive executes its partition allocation algorithm for that partition.

When specifying the swapping parameters, consider the following:

- From the time a task is loaded into memory, the average time for the task to be checkpointed by another task of the same running priority is roughly equal to the sum of the two swapping parameters.
- Tasks of the same running priority tend to get the same amount of time in memory. Tasks whose running priorities differ by less than the swapping priority range tend to receive different amounts of time in memory, with the higher priority tasks getting more time.
- Input is a factor in determining when checkpointing will occur. Editors and other interactive tasks normally should run at a higher priority than more computing-bound tasks. However, when an editor is waiting for terminal input, it can be checkpointed by any lower-priority task. As soon as its input is complete, the editor can come back into memory by checkpointing the lower-priority task. It is possible in a highly interactive system that the naturally high checkpoint rate reduces the need for the Executive swapping algorithm to service many tasks of equal priority.

#### C.1.5 Round-Robin Scheduler

The round-robin scheduler ensures that all tasks of equal priority share the CPU. Round-robin scheduling does not affect the standard processor competition among tasks of different priorities. It also does not affect tasks that are not in the specified priority range.

The round-robin scheduler affects only those tasks in memory (tasks that are in the Active Task List). Tasks that are checkpointed or in the partition wait queue are not affected.

#### C.1.6 Dynamic Memory (Pool)

During its execution, the RSX-11M-PLUS Executive has varying needs for dynamic memory. Rather than allocate a fixed amount of memory for each requirement, the Executive makes use of a dynamically allocated memory space called dynamic storage or pool. As demands are made, the

## GENERAL FEATURES AND SYSTEM TUNING

Executive allocates the necessary memory from pool using a first-fit algorithm. When allocated space is no longer needed, the Executive releases it back to the pool of available memory.

Pool requirements for a system are dependent on the configuration, application, and degree of system loading. Enough pool must be available to satisfy peak demands; otherwise, a degradation in system performance will occur.

Because nearly all Executive functions require pool, a system can exhaust pool when system activity is very heavy. This can happen if too large a number of tasks are installed, if too many volumes are mounted, or if a number of other conditions are present. When this happens, the system does not appear to have crashed, but is not functioning normally (for example, if there are data lights on the front of the processor, they will be flickering, but the system will not accept input). Under these conditions, the system cannot output error messages because the Executive requires pool space to perform I/O. Once a system exhausts pool, it may have to be rebootstraped.

You can avoid this condition in two ways. First, you should take the maximum amount of pool compatible with your system configuration during system generation. The command file SYSVMR does this for you automatically during system generation. You can then monitor pool with the Resource Monitoring Display (RMD) and take appropriate action before pool gets too low. Second, you can write tasks to monitor potential pool problems. Information on the support provided in RSX-11M-PLUS for such tasks, and information on the Pool Monitor Task (PMT) is located in the RSX-11M/M-PLUS System Management Guide.

### C.1.7 Parity Support

RSX-11M-PLUS supports parity memory. If the Executive detects a main memory parity error within a task's area, the Executive attempts to declare a parity error AST to that task. If the parity error occurs within a common region, the Executive attempts to declare a parity error AST to each task mapped to the shared region. In either case, if a task to which a parity error AST is declared does not have an AST recovery routine, the Executive aborts the task.

The Executive locks into memory the region in which the error was found. This is done to prevent that space from being reused. The Executive then invokes the FIXER task, which probes the region and reduces it to only the segment containing the error.

When the Executive aborts a task, it issues a message noting that fact. When a parity error is detected within the Executive, or if the Executive detects a parity error when looking into a task, the system attempts to print the following message before halting:

```
***EXEC PARITY ERROR STOP***
```

For cache parity errors, the half of the cache in which the parity error was detected is disabled if two errors in the same half are detected within the same minute. If less than one error per minute is detected and the system recovers by reading through to main memory, the cache is not disabled. With either one or both halves of the cache disabled, the system still operates, but in a degraded state and errors will be logged.

## C.2 INCREASING FILE SYSTEM THROUGHPUT

### C.2.1 Multiple File Systems

For systems with several high-performance disks, you can increase file system throughput by mounting each volume with a separate FllACP. See the RSX-11-PLUS Command Language Manual for information on the commands used to mount volumes with separate FllACPs.

### C.2.2 File System Options

Many options of the INI and MOU commands can change system performance. The more important options are:

- MOU /EXT or INI /EXT (default extension block count)

When a disk file is created or extended, the file system allocates a default number of additional disk blocks to the file. This default is ordinarily five blocks. For example, if a task writes 12 blocks of data in a file, three 5-block allocations are made, and the remaining three blocks are unused. You can use the /EXT switch to change the default number of disk blocks allocated.

Each allocation of disk blocks requires a number of disk accesses to find the free space on the disk, allocate the space, and mark the space used in the file header. Therefore, increasing this default above five blocks decreases the number of file-system overhead disk accesses when writing files and increases the number of wasted disk blocks (blocks allocated but not used). On the other hand, decreasing this default below five blocks decreases the number of wasted disk blocks and increases the number of file-system overhead disk accesses performed when extending files.

A task can override this default extension block count when creating or extending a file. In addition, you can use the PIP /TR switch to free unused space at the end of a file. Application tasks can override the files system defaults and perform more optimal file extensions for the processing they perform. You can use these techniques, possibly with the /EXT switch, to provide more optimal disk allocation.

- INI /INDX (index file position)

The position of the index file in large volumes is important because the seek time can decrease performance. Rather than having the index file at the beginning or end of a volume, position it (either by block number or the MID key word) at the midpoint of the volume.

For small volumes, such as a floppy disk, putting the index file at the midpoint limits the maximum size of the work files on the disk. In this case, put the index file at the beginning or end of the volume.

- MOU /LRU or INI /LRU (memory buffers to speed directory searches)

/LRU specifies the number of buffers to be maintained in memory. The buffers contain only the most recently accessed directories. The default is three buffers. If your

## GENERAL FEATURES AND SYSTEM TUNING

application is working with a small number of directories, the defaults may be sufficient. However, if many directories are being scanned frequently, access time will improve if you specify a higher number than 3. However, more buffers use more pool.

- MOU /WIN or INI /WIN (mapping pointer count)

WIN specifies the number of mapping pointers to be allocated for file windows. The default is seven pointers. The pointers point to contiguous blocks of the file on the disk. You can optimize access to fragmented files by increasing the number of pointers. However, additional pool may be freed by reducing the number of pointers (when you initialize the disk) for files with little or no fragmentation.

Note that the MCR command SAV has a MOU keyword that allows you to use the MOU options on the system disk. For more information on these keywords, refer to the RSX-11M/M-PLUS MCR Operations Manual.

### C.3 DYNAMIC CHECKPOINT SPACE ALLOCATION AND TASK EXTENSION

You can improve memory usage in large systems by making all or most of the tasks in the system checkpointable. In doing so, you can greatly reduce the system disk requirements. Dynamic checkpoint space allocation allows all task checkpointing operations to use common system checkpoint files. Thus, you can install tasks as checkpointable without having to allocate checkpoint space in the task image file. Furthermore, you can run multiple copies of a checkpointable task. Coupled with task checkpointing during terminal input and output, the number of tasks that absolutely require memory residency can be reduced.

The MCR command ACS establishes and eliminates system checkpoint files. One checkpoint file may be established for each mounted Files-11 volume. When the Executive requires checkpoint space, it favors the devices in the allocation order of the checkpoint files. Therefore, if you issue multiple ACS commands, you should specify the fastest devices first.

For example, a system may have both an RS04 fixed-head disk and an RP06 movable-head disk. The system manager may determine that limited checkpoint space (400 blocks) can be allocated on the RS04. To ensure that checkpoint allocation failures never occur, you should allocate additional space (2000 blocks) on the RP06.

As the Executive allocates and deallocates checkpoint space, the checkpoint files can fill up and become fragmented. When possible, freed-up checkpoint space is reused. However, depending on the sizes of the checkpoint files and the amount of fragmentation, the Executive may fail to find space to fulfill a checkpoint request. In this case, a task that is intended to get into memory does not get in until additional memory or checkpoint space becomes available.

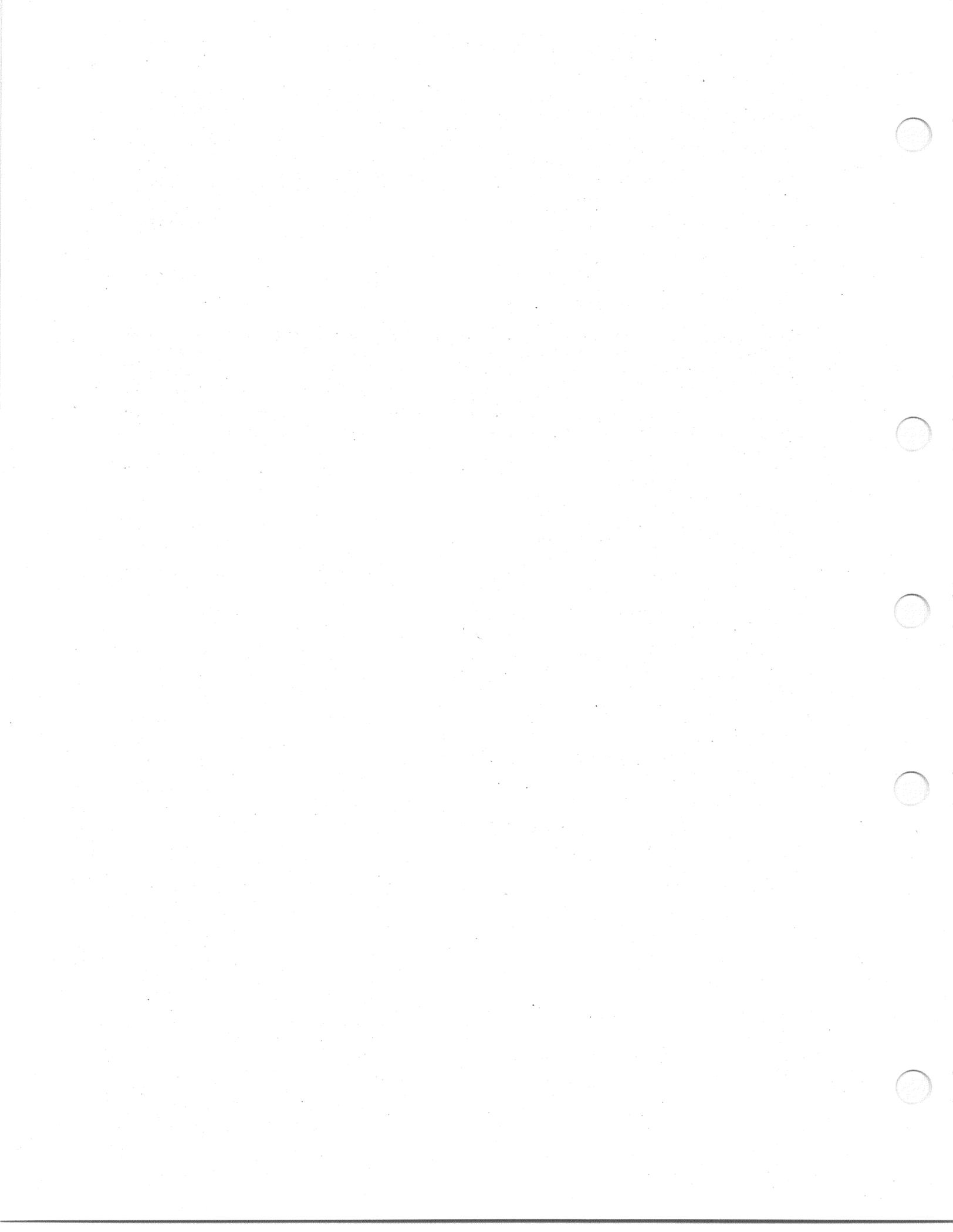
If a critical task must get into memory, it may be unacceptable for a checkpoint operation to fail. To ensure that any given task can always be checkpointed, allocate checkpoint space in the task image file. There can be no checkpoint allocation failures in partitions in which all active tasks have preallocated checkpoint space. A task that has checkpoint space preallocated in its task image file is checkpointed to this space only if the Executive fails to find space for the task in the checkpoint files.

## GENERAL FEATURES AND SYSTEM TUNING

The Extend Task directive allows tasks to increase or decrease their memory allocation during execution. The system utilities, MACRO and Task Builder, use the Extend Task directive to maintain a memory-resident symbol table until the table reaches the maximum size specified by the system manager. These utilities can be installed with an increment as low as 2048(decimal) to reduce their initial memory requirements. For large assemblies and task-builds, these utilities increase their size to the operator-set maximum for increased speed and return to their original size before processing the next command.

### C.4 OVERLAPPED I/O COMPLETION

Overlapped I/O completion support causes the execution of I/O completion code for each I/O request to be postponed until the next request has been initiated. If I/O requests are in the driver's queue, this action causes the Executive to complete the I/O processing while the physical device services the next request. A minor side effect of this feature is that multiple I/O requests to the same device may complete in an order other than the issued order.



## APPENDIX D

### TWO SYSTEM GENERATION EXAMPLES

This appendix contains examples of terminal output from two different system generations. You can use these examples as guides to what you should see on your terminal as you proceed through a system generation.

In both examples, the SYSGEN command file is invoked, the PREPGEN option selected, and saved answer files are created. Then SYSGEN is invoked again, using the saved answer files created during the PREPGEN.

Section D.1 contains a terminal trace from a simple, stand-alone system generation. The user chose the Full-functionality Executive and used Autoconfigure to determine his hardware configuration. If you are generating an RSX-11M-PLUS system for the first time, you should choose these options also, and your terminal trace should be similar to these examples.

Section D.2 contains a terminal trace from a more complex system generation, performed on line. This user chose the User-tailored Executive and entered device information manually. (Autoconfigure cannot be used if you are performing an on-line system generation.) She did not choose to have the full explanation printed before each question, but pressed the ESC key to print the full explanation for questions on which she needed additional information. In these cases, the SYSGEN procedure printed the full explanation, then reprinted the question.

## TWO SYSTEM GENERATION EXAMPLES

### D.1 A SAMPLE STAND-ALONE SYSTEM GENERATION

>>>BMS (RET)

RSX-11M/M-PLUS Standalone Copy System V03

RSX-11M/M-PLUS Standalone Configuration and Disk Sizing Program

Valid switches are:

/CSR=nnnnnn to change the default device CSR  
/VEC=nnn to change the default device vector  
/FOR=n to change the default magtape formatter number  
/DEV to list all default device CSR and vectors

Enter first device: /DEV (RET)

Device	CSR	Vector	CSR Status
DB	176700	254	Preent
DK	177404	220	Present
DL	174400	160	Present
DM	177440	210	Present
DP	176714	300	Not Present
DR	176300	150	Present
DU	172150	154	Present
MM FOR=0	172440	330	Not Present
MS	172522	224	Present
MT	160000	320	Not Present
MU	174500	260	Not Present

Enter first device:MS0: (RET)

Enter second device:DM0: (RET)

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY' (RET)

>TIM 7:53 5/17/85 (RET)

>TIM (RET)  
7:53:05 17-MAY-85

>RUN BAD (RET)

BAD>DMO:/LIST (RET)  
BAD -- DMO: Total bad blocks= 0.  
BAD> (CTRL/Z)

>RUN BRU (RET)

BRU>/DENSITY:1600/VERIFY/MAX:3308/HEADERS:1654 (RET)  
From: MS0: (RET)  
To: DM0: (RET)  
BRU - Starting Tape 1 on MS 0:  
  
BRU - End of Tape 1 on MS 0  
  
BRU - Starting verify pass Tape 1 on MS0:  
  
BRU - End of Tape 1 on MS0:  
  
BRU - Completed  
  
BRU> (CTRL/Z)

TWO SYSTEM GENERATION EXAMPLES

```

CTRL-P
CONSOLE
>>> H (RET)
17777707 016340
>>> B DMO (RET)

RSX-11M-PLUS V3.0 BL24 384.KW System:"Baseline"
>RED DM:=SY:
>RED DM:=LB:
>RED DM:=SP:
>MOU DM:"RSX11MPBL24"
>@[2,54]BASTART
>;
>;
>; Please ignore any random characters that may have printed on your
>; terminal just now. They came from a SET /INQUIRE=TI: command.
>; Evidently your terminal does not recognize escape sequences.
>; This will not affect the running of this command file.
>;
>;
>; RSX-11M-PLUS V3.0 Distribution Kit
>;
>; This is the baseline system of the RSX-11M-PLUS V3.0
>; distribution kit. This system contains an assortment of
>; devices and may in fact be of some use on your target
>; system. The main purpose of the baseline system, however,
>; is to provide a working system environment which may be
>; used to generate a custom-tailored operating system for
>; your target hardware. We will now provide instructions
>; to guide you through the startup procedure.
>;
>;
>; It is important to specify the correct date and time.
>; Use the format "DD-MMM-YY HH:MM".
>;
>* Please enter the date and time [S]: 17-MAY-85 8:10 (RET)
>TIME 17-MAY-85 8:10
>;
>; Now allocate checkpoint space for use by system utilities.
>;
>ACS SY:/BLKS=1024.
>;
>; The following information is necessary for this command file
>; to correctly access the remainder of the distribution kit.
>;
>* Did you receive your M-PLUS distribution kit on magnetic tape? [Y/N]: Y (RET)
>;
>; Please enter the name of the magnetic tape drive, which should
>; still contain the distribution tape. The name is of the form:
>;
>; MM1: or
>; MS0: etc...
>;
>* Which tape drive contains the distribution tape [S]: MS0: (RET)
>;
>; We will now set the CSR of the controller that will be
>; used to bring in the remainder of the distribution kit to
>; the standard value. If your controller is not at this address
>; it will be necessary for you to manually configure the system
>; by issuing the appropriate CON commands. Answer Yes to the
>; manual configuration question to do this. If your controller
>; is at the standard address, you do not have to do a manual
>; configuration.

```

TWO SYSTEM GENERATION EXAMPLES

```

>;
>CON SET RHC CSR=160000
>CON SET MTA CSR=160000
>CON SET MSA CSR=172522
>CON SET MSA VEC=224
>CON SET MUA CSR=160000
>;
>;      We will now bring on line all devices which were generated into
>;      this baseline image and which exist in your hardware system.
>;
>;      If there is hardware in your system occupying a control
>;      register address which conflicts with a standard DIGITAL
>;      register assignment, it is possible that the "CON ONLINE
>;      ALL" command might cause a system crash. This is because
>;      a DIGITAL device driver is attempting to manipulate foreign
>;      hardware or the CSR address assignments in your system are
>;      different from those assumed in this baseline configuration.
>;      On the first pass through this file please answer No to the
>;      following question. If such a mismatch exists and a crash
>;      does occur, rebootstrap the baseline system and answer Yes
>;      to this question. Instructions will then be provided to help
>;      circumvent the problem.
>;
>* Do you need to do manual configuration? [Y/N]:  (RET)
>;
>CON ONLINE ALL
>;
>;      Prepare to bring in the remainder of the distribution kit
>;
>* Is your target system disk an RK07? [Y/N]: Y  (RET)
>;
>;      The pack onto which you have just loaded your RSX-11M-PLUS V3.0
>;      system now contains all the files that will be needed by the SYSGEN
>;      procedure. There is another backup set on the distribution tape
>;      that contains all of the other sources shipped as part of the normal
>;      distribution. This backup set will be restored to another pack which
>;      you must provide. This pack can also be used during SYSGEN to hold
>;      the Executive listing and maps since they will not fit on the target
>;      system disk.
>;
>;      Please supply the name of a drive that contains an empty pack to
>;      receive the source files.
>;
>;      NOTE: All current data on this pack will be lost.
>;
>* Enter the name of the disk to receive the sources [S]: DML: (RET)
>;
>;      We will now mount the pack that will receive the sources.
>;
>MOU DML:/FOR
>;
>;      The pack in DML: can now be formatted and/or checked for
>;      bad blocks if necessary. It is generally not necessary to format
>;      the pack unless you know that it is not properly formatted. The
>;      bad block check is highly recommended.
>;
>* Do you wish to format the disk in DML:? [Y/N]:  (RET)
>;
>* Do you wish to run the Bad Block Locator on DML:? [Y/N]: Y  (RET)
>;
>INS $BAD
>BAD DML:/LIST
BAD -- DML: Total bad blocks= 0.
>;
>;      We will now mount the tape in MS: for access by BRU.
>;

```

## TWO SYSTEM GENERATION EXAMPLES

```
>MOU MS:/FOR/DENS=1600
>;
>;      Ensure that the BRU task is installed.
>;
>INS $BRU
>;
>;      We will now load the remainder of the distribution kit.
>;
>TIME
08:21:11 17-MAY-85
>;
>BRU /BAC:MPBL24SRC/NOPRES/INI/HEADER:1654/DENS:1600/VER MS: DML:
BRU - Starting Tape 1 on MS0:

BRU - This disk will not contain a hardware bootable system

BRU - End of Tape 1 on MS0:

BRU - Starting verify pass Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed

>;
>DMO MS:/LOCK=UNLOAD
DMO -- TT2:   dismantled from MS0:   *** Final dismount initiated ***
>;
>TIME
08:45:48 17-MAY-85
>DMO DML:/LOCK=NOUNLOAD
DMO -- TT2:   dismantled from DML:   *** Final dismount initiated ***
>MOU DML:/OVR
>;
>;      We will now copy the help files from the second disk to the target
>;      system disk.
>;
>SET /UIC=[1,2]
>PIP SY:[1,2]/CD=DML:[1,2]
>;
>;      We will now create any UFDs that must be created on your disk(s).
>;      You will not see the UFD commands.
>;
UFD-E, directory already exists
>TIME
08:48:10 17-MAY-85
>;
>;
>;      The preparation of the RSX-11M-PLUS kit is now complete. The next
>;      time this disk is bootstrapped, this dialog will only be repeated
>;      on request. We will now record the successful installation in the
>;      log file on the new system disk, and either exit if the installation
>;      was done on line, or proceed with the normal startup sequence if the
>;      baseline system was used.
>;
>SET /UIC=[2,54]
>PIP LB:[1,1]KITIDENT.DAT/AP=LB:[2,54]INSTALOG.DAT
>;
>;
>SET /UIC=[200,200]
>;      PLEASE NOTE
>;
>;      If you have not yet read the system release notes do so now
>;      before attempting to perform an Update, a SYSGEN, or to
>;      utilize the new features of this system.
```

## TWO SYSTEM GENERATION EXAMPLES

```

>;
>; Generally, an Update kit will have to be installed before a
>; system should be generated from this kit. See the
>; documentation supplied with the Update kit.
>;
>; If the Update has already been installed, does not contain
>; any RSX-11M-PLUS patches, or is not to be installed for some
>; reason, the SYSGEN process can be started directly.
>;
>; In order to start the SYSGEN process, type:
>;
>; >@SYSGEN
>;
>; When SYSGEN has completed and your generated system is
>; running, you may wish to edit several DIGITAL-supplied
>; prototype command and text files to suit your system
>; and application:
>;
>; File                Purpose
>; ----                -
>; [0,0]RSX11.SYS      An account/password file
>;                    This file does contain privileged accounts.
>;
>; [1,2]STARTUP.CMD    (This file) Invoked at bootstrap time to
>;                    control bringing up the system.
>;
>; [1,2]QMGSTART.CMD   Invoked by STARTUP to start up the Queue
>;                    Manager and spooling system.
>;
>; [1,2]SHUTUP.CMD     Invoked by SHUTUP when taking down the system
>;                    to perform system dependent shutdown tasks.
>;
>; [1,2]QMGSTOP.CMD    Invoked by SHUTUP to stop the Queue Manager
>;                    and spooling system.
>;
>; [1,2]LOGIN.TXT      Displayed on user's terminal when logging in.
>;
>; [1,2]BATCH.TXT      Displayed at the beginning of each batch log
>;                    file.
>;
>;
>; Please ignore any random characters that may have printed on your
>; terminal just now. They came from a SET /INQUIRE=TI: command.
>; Evidently your terminal does not recognize escape sequences.
>; This will not affect the running of this command file.
>;
>ELI /LOG/LIM
>CLI /INIT=DCL/CTRLC
>INS LB: [3,54]RMSRES.TSK/RON=YES/PAR=GEN
>INS LB: [1,1]RMSLBA.TSK/RON=YES/PAR=GEN
>INS LB: [1,1]RMSLBB.TSK/RON=YES/PAR=GEN
>INS LB: [1,1]RMSLBC.TSK/RON=YES/PAR=GEN
>INS LB: [1,1]RMSLBD.TSK/RON=YES/PAR=GEN
>INS LB: [1,1]RMSLBE.TSK/RON=YES/PAR=GEN
>INS LB: [1,1]RMSLBF.TSK/RON=YES/PAR=GEN
>QUE /STOP:QMG
>INS $QMGCLI/TASK=...PRI
>INS $QMGCLI/TASK=...SUB
>QUE /START:QMG
>INS $QMGPRP/TASK=PRT.../SLV=NO
>QUE LPO:/CR/NM
>START/ACCOUNTING
>CON ESTAT LPO:

```

TWO SYSTEM GENERATION EXAMPLES

```

>QUE LP0:/SP/FL:2/LOWER/FO:0
>QUE BAP0:/BATCH
>QUE LP0:/AS:PRINT
>QUE BAP0:/AS:BATCH
>@ <EOF>
>
>@SYSGEN (RET)
>;
>; RSX-11M-PLUS SYSGEN BL24
>;
>; COPYRIGHT (c) 1985
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>;
>;
>; To exit from the SYSGEN procedure at any time, type CTRL/Z.
>;
>; If you are unsure of the answer to a question for which a de-
>; fault answer exists, use the default answer.
>;
>;
>;
>;=====
>; Choosing SYSGEN Options      17-MAY-85 at 09:27
>;=====
>;
>;
>; Every question is preceded by a question number (for example SU010)
>; which you can use to find the explanation of the question in the
>; RSX-11M-PLUS System Generation and Installation Guide.
>;
>; An explanation of every question is also available by pressing
>; the ESC key (or the ALTMODE key) in response to the question.
>;
>; If you are unfamiliar with the SYSGEN procedure, the explanation of
>; each question can be printed automatically before the question.
>;
>* SU010 Do you always want the explanation printed? [Y/N D:N]: (RET)
>;
>; SYSGEN always creates saved answer files containing your responses
>; to the SYSGEN questions:
>;
>;   SYSGENSA1.CMD      Setup questions, Executive options
>;   SYSGENSA2.CMD      Peripheral configuration
>;   SYSGENSA3.CMD      Nonprivileged task builds
>;
>; You should perform a PREPGEN first to create saved answer files, and
>; then perform a SYSGEN, specifying those saved answer files as input
>; to the Executive, peripheral, and nonprivileged task build sections.
>;
>* SU020 Do you want to use a saved answer file as input for
>*      the Executive options? [Y/N D:N]: (RET)
>;
>* SU040 Do you want to use a saved answer file as input for
>*      the peripheral configuration? [Y/N D:N]: (RET)
>;
>* SU060 Do you want to use a saved answer file as input for
>*      the nonprivileged task builds? [Y/N D:N]: (RET)
>;
>* SU080 Do you want to do a PREPGEN? [Y/N D:N]: Y (RET)
>;
>* SU090 Enter the name of the disk drive containing your
>*      target system disk [ddnn:] [S R:2-5]: DM0: (RET)
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>ASN DMO:=IN:
>ASN DMO:=OU:
>ASN DMO:=LB:
>ASN DMO:=WK:
>ASN DMO:=TK:
>ASN DMO:=BC:
>ASN DMO:=LI:
>ASN DMO:=OB:
>ASN DMO:=EX:
>ASN DMO:=MP:
>;
>* SU100   Do you want to run Autoconfigure on the host system
>*         hardware? [Y/N D:N]: Y (RET)
>;
>; Running Autoconfigure:
>;
>INS $ACF
>ACF
>INS $ACO
>ACO SHOW
Processor Type: 11/44           Memory Size: 384. Kw
Options:
    Floating Point Processor (FP11)
    Commercial Instruction Set (CIS)
    Extended Instruction Set (EIS)
    Extended (22-Bit) Addressing
    Switch Register (SWR)
    Display Register
    Cache Memory
Name  Vector   CSR      Unit   Type   Remark
RHA   254      176700   0      RM02
DMA   210      177440   0      RK07
      1      RK07
DLA   160      174400   0      RL02
      1      RL02
MSA   224      172522
DDA   300      176500
LPA   200      177514
YLA   060      177560
YLB   310      176510
YZA   330      160110
>ACO SYSGEN
>;
>* SU110   Do you want to override the Autoconfigure results? [Y/N D:N]: (RET)
>;
>; You can:
>;
>;     • do a complete SYSGEN
>;
>;     • continue a previous SYSGEN from where you left off
>;
>;     • do an individual section of SYSGEN
>;
>;
>* SU120   Do you want to do a complete SYSGEN? [Y/N D:Y]: Y (RET)
>;
>!INS [3,54]MAC/TASK=MACT2
>!INS [3,54]PIP/TASK=PIPT2
>!INS [3,54]LBR/TASK=LBRT2
>!INS [3,54]TKB/TASK=TKBT2
>!INS [3,54]VMR/TASK=VMRT2
>;
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>;
>;=====
>; Choosing Executive Options          17-MAY-85 at 09:28
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>; Enter a comment for inclusion in the SYSGENSA1 saved answer file.
>; The comment may contain more than one line. The "v" in the right
>; margin below marks the maximum line length. When you are done,
>; press RETURN in response to the prompt.
>;
>* Comment [S R:0.-55.]: Example SYSGEN for the RSX-11M-PLUS System (RET)
>* Comment [S R:0.-55.]: Generation and Installation Guide (RET)
>* Comment [S R:0.-55.]: (RET)
>;
>* CE020 Do you want the Full-functionality Executive? [Y/N D:Y]: (RET)
>;
>* CE120 Do you want support for communications products
>* (such as DECnet, PSI, and LAT)? [Y/N D:N]: Y (RET)
>;
>* CE122 Do you want host support for LAT terminal servers? [Y/N D:N]: (RET)
>;
>* CE130 What is the system name? [S R:0-6 D:"RSXMPL"]: TSTSYS (RET)
>;
>* CE264 Do you want IP11 industrial I/O subsystem support? [Y/N D:N]: (RET)
>;
>* CE270 Do you want to include XDT? [Y/N D:N]: Y (RET)
>;
>* CE280 Enter the crash notification device CSR
>* address [O R:160000-177700 D:177564]: (RET)
>;
>; Note: Enter both the device and the logical unit number.
>; For example, MM0: or DL1:.
>;
>* CE290 On what device and unit do you want crash dumps
>* to be written? [S R:2-6]: DL0: (RET)
>;
>* CE330 Is your system clock programmable (KW11-P)? [Y/N D:N]: (RET)
>;
>* CE350 Is your line frequency 50 Hz? [Y/N D:N]: (RET)
>;
>;
>;=====
>; Choosing Peripheral Configuration    17-MAY-85 at 09:34
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA2.CMD.
>;
>; Enter a comment for inclusion in the SYSGENSA2 saved answer file.
>; The comment may contain more than one line. The "v" in the right
>; margin below marks the maximum line length. When you are done,
>; press RETURN in response to the prompt.
>;
>* Comment [S R:0.-55.]: Example SYSGEN for the RSX-11M-PLUS System (RET)
>* Comment [S R:0.-55.]: Generation and Installation Guide (RET)
>* Comment [S R:0.-55.]: (RET)
>;

```

v

v

TWO SYSTEM GENERATION EXAMPLES

```

>;
>; DR:   controllers: RH11, RH70   devices: RM02
>;                RH70                RM03, RM05, RM80, RP07
>;
>;                RH Configuration
>;
>;                Physical Unit Number
>;
>;                0      1      2      3      4      5      6      7
>;
>; RHA DR0:
>;
>;
>;
>;
>; DM:   controllers: RK611, RK711  devices: RK06, RK07
>;
>;                DM Configuration
>;
>;                Physical Unit Number
>;
>;                0      1      2      3      4      5      6      7
>;
>; DMA DM0:   DM1:
>;
>;
>;
>;
>; DL:   controllers: RL11, RLV12  devices: RL01, RL02
>;
>;                DL Configuration
>;
>;                Physical Unit Number
>;
>;                0      1      2      3      4      5      6      7
>;
>; DLA DL0:   DL1:
>;
>;
>;
>;
>; CR:   controllers: CM11, CR11
>;
>* CP4004 How many CM/CR11 card readers do you have? [0 D:0]:  RET
>;
>;
>; MS:   controllers: TS11, TU80, TSV05, TK25
>;
>;
>; DD:   controller:  DL11           device:  TU58
>;
>;
>; LP:   controllers: LA180, LN01, LP11, LS11, LV11
>;        devices:    LA180, LN01, LP01, LP02, LP04, LP05, LP06,
>;                  LP07, LP14, LP25, LP26, LP27, LS11, LV01
>;
>* CP5408 Enter the number of seconds between
>*        line printer-not-ready messages [D R:0.-255. D:15.]:  RET
>;
>* CP5480 Enter line printer type for LPA [S R:4-5 D:"LP25"]:  RET
>;
>* CP5484 Does LPA have lowercase characters? [Y/N D:N]:  Y  RET
>;
>;
>; LA:   controller:  LPA11
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>* CP6204 How many LPA11 lab subsystems do you have? [D R:0.-16. D:0.]: (RET)
>;
>;
>; TT: controllers: DL11, DLV11 controller mnemonic: YL
>;
>* CP6820 Do any of the DL11/DLV11 lines require modem support? [Y/N D:N]: (RET)
>;
>* CP6832 Enter terminal type for YLA [S R:4-6 D:"LA120"]: (RET)
>;
>* CP6832 Enter terminal type for YLB [S R:4-6 D:"LA120"]: (RET)
>;
>;
>; TT: controller: DJ11 controller mnemonic: YJ
>;
>* CP7204 Enter number of DJ11 asynchronous line
>* multiplexers [D R:0.-16. D:0.]: (RET)
>;
>;
>; TT: controllers: DZ11, DZQ11, DZV11 controller mnemonic: YZ
>;
>* CP7420 Do any of the DZ lines require modem support? [Y/N D:N]: (RET)
>;
>* CP7484 Enter terminal type for YZA [S R:4-6 D:"VT100"]: (RET)
>;
>;
>* CP7604 Do you have any intercomputer communication devices? [Y/N D:N]: (RET)
>;
>;
>; Enter device mnemonics for any user-supplied drivers. The driver
>; source files must reside in [11,10] and be named ddDRV.MAC and
>; ddTAB.MAC where dd is the device mnemonic.
>;
>; You may enter the mnemonics on more than one line. When you have
>; listed all the drivers, press RETURN when asked for the device
>; mnemonic.
>;
>; The device mnemonic must not include a colon.
>;
>* CP9604 Enter device mnemonics for user-supplied drivers [S]: (RET)
>;
>;
>; The highest vector among the devices you specified in this SYSGEN
>; is 374(octal). This is the default response for this question.
>;
>* CP9632 What is the highest interrupt vector
>* address? [O R:374-774 D:374]: 774 (RET)
>;
>;
>;
>;=====
>; Assembling the Executive and Drivers 17-MAY-85 at 09:44
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>!PIP RSXMC3.MAC=RSXMC1.MAC,RSXMC2.MAC
>!PIP RSXMC.MAC=RSXMC3.MAC,RSXMC0.MAC
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>!SET /UIC=[1,24]
>!PIP [11,10]/NV=[200,200]RSXMC.MAC
>!PIP [11,10]/NV=[200,200]SYSTB.MAC
>!PIP [11,24]/NV=[200,200]RSXASM.CMD
>!PIP [11,24]/NV=[200,200]DRIVERS.ASM
>;
>;
>* AE010 Do you want assembly listings of the Executive and
>* drivers? [Y/N D:N]: (RET)
>;
>!ASN NL:=LS:
>;
>;
>* AE030 Do you wish to pause to edit any files before
>* assembling? [Y/N D:N]: (RET)
>;
>!SET /UIC=[11,24]
>;
>!PIP *.OBJ;*/DE/NM,*.TTY;*
>;
>!TIME
>;
>!MAC @RSXASM
>;
>!TIME
>;
>!MAC @DRIVERS.ASM
>;
>!TIME
>;
>!PIP RSX11M.OBS=*.OBJ
>!PIP TTDRV.OBS=*.TTY
>;
>!SET /UIC=[200,200]
>!PIP /NV=[11,10]RSXMC.MAC
>;
>!SET /UIC=[1,24]
>!PIP RSXBLD.CMD/PU/NM
>!PIP RSX11M.OLB;*/DE/NM
>!PIP [200,200]RSXMC.MAC/PU/NM
>;
>!LBR RSX11M/CR:256.:256./-EP=[11,24]RSX11M.OBS
>;
>!LBR TTDRV/CR:40.:392.:128.=[11,24]TTDRV.OBS
>;
>;
>;
>;=====
>; Building the Executive and Drivers 17-MAY-85 at 09:44
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>;
>; Allocate space to be used later for the system image file.
>;
>!SET /UIC=[1,54]
>!PIP RSX11M.TMP/CO/BL:1026.=NL:
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>;
>!SET /UIC=[1,54]
>!PIP SYSVMR.CMD=[200,200]SYSVMR.CMD,VMRTTY.CMD
>;
>;
>* BE030 Do you want to pause to edit any files before
>* task-building? [Y/N D:N]: (RET)
>;
>!SET /UIC=[1,24]
>!PIP [1,24]/NV/NM=[200,200]RSXBLD.CMD,RSX11M,DSP11M,LDR11M
>!PIP [1,24]/NV=[200,200]DIR11M.CMD,DR211M,DIRCOM,DR2COM,DIR
>!PIP [1,24]/NV=[200,200]DR311M.CMD,DR411M,DR3COM,DR4COM
>!PIP [1,24]/NV=[200,200]VEC11M.CMD,DCM11M,VECCOM,DCMCOM
>;
>!TIME
>;
>!TKB @RSXBLD
>;
>!TIME
>;
>!TKB @[200,200]DRIVERS.BLD
>;
>!TIME
>;
>;
>;=====
>; Building the Privileged Tasks 17-MAY-85 at 09:45
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>;
>* BP040 Do you want the maps of the privileged tasks? [Y/N D:N]: (RET)
~
>!ASN NL:=MF:
>;
>!SET /UIC=[1,24]
>;
>!TIME
>;
>!TKB @ACCFSLBLD
>!TKB @ACDBLD
>!TKB @ACNFSLBLD
>!TKB @ACSFSLBLD
>!TKB @BOOBLD
>!TKB @BPRBLD
>!TKB @BROBLD
>!TKB @BYEBLD
>!TKB @COTFSLBLD
>!TKB @DMOBLD
>!TKB @ELIFSLBLD
>!TKB @ERLBLD
>!TKB @FCPLRGLD
>!TKB @FXRBLD
>!TKB @F11MSGBLD
>!TKB @HELFSLBLD
>!TKB @HRCBLD
>!TKB @INIBLD
>!TKB @INSBLD
>!TKB @LOABLD

```

TWO SYSTEM GENERATION EXAMPLES

```

>!TKB @LPPFSLBLD
>!TKB @MCRBLD
>!TKB @MCDBLD
>!TKB @MOUBLD
>!TKB @MTABLD
>!TKB @PMDFSLBLD
>!TKB @PMTBLD
>!TKB @PSWFSLBLD
>!TKB @QMGFSLBLD
>!TKB @RMDBLD
>!TKB @SAVBLD
>!TKB @SHABLD
>!TKB @SHFBLD
>!TKB @SHUBLD
>!TKB @SYLFSLBLD
>!TKB @TKNBLD
>!TKB @UFDBLD
>!TKB @UNLFSLBLD
>;
>!TIME
>;
>!ASN LB:=OU:
>;
>;
>;
>;=====
>; Building the Nonprivileged Tasks      17-MAY-85 at 09:46
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA3.CMD.
>;
>;
>* BN010   Do you want to rebuild any nonprivileged tasks? [Y/N D:N]: RET
>;
>;
>;
>;=====
>; Creating the System Image File        17-MAY-85 at 09:46
>;=====
>;
>;
>!SET /UIC=[1,54]
>;
>!PIP RSX11M.TMP;*/DE/NM
>;
>!PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK
>;
>!ASN LB:=SY:
>!VMR @SYSVMR
>;
>!REM MACT2
>!REM PIPT2
>!REM LBRT2
>!REM TKBT2
>!REM VMRT2
>;
>; End of PREPGEN
>;
>TIME
09:46:25 17-MAY-85
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>ASN =
>
>@ <EOF>
>
>
>@SYSGEN (RET)
>
>; RSX-11M-PLUS SYSGEN BL24
>
>; COPYRIGHT (c) 1985
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>
>;
>; To exit from the SYSGEN procedure at any time, type CTRL/Z.
>
>; If you are unsure of the answer to a question for which a de-
>; fault answer exists, use the default answer.
>
>;
>;
>;=====
>; Choosing SYSGEN Options          17-MAY-85 at 09:48
>;=====
>
>
>
>; Every question is preceded by a question number (for example SU010)
>; which you can use to find the explanation of the question in the
>; RSX-11M-PLUS System Generation and Installation Guide.
>
>; An explanation of every question is also available by pressing
>; the ESC key (or the ALTMODE key) in response to the question.
>
>; If you are unfamiliar with the SYSGEN procedure, the explanation of
>; each question can be printed automatically before the question.
>
>* SU010 Do you always want the explanation printed? [Y/N D:N]: (RET)
>
>; SYSGEN always creates saved answer files containing your responses
>; to the SYSGEN questions:
>
>; SYSGENSA1.CMD Setup questions, Executive options
>; SYSGENSA2.CMD Peripheral configuration
>; SYSGENSA3.CMD Nonprivileged task builds
>
>; You should perform a PREPGEN first to create saved answer files, and
>; then perform a SYSGEN, specifying those saved answer files as input
>; to the Executive, peripheral, and nonprivileged task build sections.
>
>* SU020 Do you want to use a saved answer file as input for
>* the Executive options? [Y/N D:N]: Y (RET)
>
>* SU030 Enter saved answer file name [S D:"SYSGENSA1.CMD"]: (RET)
>
>* SU040 Do you want to use a saved answer file as input for
>* the peripheral configuration? [Y/N D:N]: Y (RET)
>
>* SU050 Enter saved answer file name [S D:"SYSGENSA2.CMD"]: (RET)
>
>* SU060 Do you want to use a saved answer file as input for
>* the nonprivileged task builds? [Y/N D:N]: Y (RET)
>
>* SU070 Enter saved answer file name [S D:"SYSGENSA3.CMD"]: (RET)
>

```

TWO SYSTEM GENERATION EXAMPLES

```

>* SU080  Do you want to do a PREPGEN? [Y/N D:N]: N RET
>;
>* SU090  Enter the name of the disk drive containing your
>         target system disk [ddnn:] [S R:2-5]: DM0: RET
>;
>ASN DM0:=IN:
>ASN DM0:=OU:
>ASN DM0:=LB:
>ASN DM0:=WK:
>ASN DM0:=TK:
>ASN DM0:=BC:
>ASN DM0:=LI:
>ASN DM0:=OB:
>ASN DM0:=EX:
>ASN DM0:=MP:
>;
>* SU100  Do you want to run Autoconfigure on the host system
>*        hardware? [Y/N D:N]: RET
>;
>; You can:
>;
>;     • do a complete SYSGEN
>;
>;     • continue a previous SYSGEN from where you left off
>;
>;     • do an individual section of SYSGEN
>;
>;
>* SU120  Do you want to do a complete SYSGEN? [Y/N D:Y]: RET
>;
>INS [3,54]MAC/TASK=MACT2
>INS [3,54]PIP/TASK=PIPT2
>INS [3,54]LBR/TASK=LBRT2
>INS [3,54]TKB/TASK=TKBT2
>INS [3,54]VMR/TASK=VMRT2
>;
>;
>;
>;=====
>; Choosing Executive Options          17-MAY-85 at 09:50
>;=====
>;
>;
>; Using saved answer file DM0:[200,200]SYSGENSA1.CMD;1
>; created on 17-MAY-85 at 09:28:56.
>;
>; Example SYSGEN for the RSX-11M-PLUS System
>; Generation and Installation Guide
>;
>;
>;
>;=====
>; Choosing Peripheral Configuration    17-MAY-85 at 09:50
>;=====
>;
>;
>; Using saved answer file DM0:[200,200]SYSGENSA2.CMD;1
>; created on 17-MAY-85 at 09:34:22.
>;
>; Example SYSGEN for the RSX-11M-PLUS System
>; Generation and Installation Guide
>;
>;
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>;
>; DR:   controllers: RH11, RH70   devices: RM02
>;                RH70                RM03, RM05, RM80, RP07
>;
>;                RH Configuration
>;
>;                Physical Unit Number
>;
>;                0      1      2      3      4      5      6      7
>;
>; RHA DR0:
>;
>;
>;
>; DM:   controllers: RK611, RK711  devices: RK06, RK07
>;
>;                DM Configuration
>;
>;                Physical Unit Number
>;
>;                0      1      2      3      4      5      6      7
>;
>; DMA DM0:   DM1:
>;
>;
>;
>; DL:   controllers: RL11, RLV12   devices: RL01, RL02
>;
>;                DL Configuration
>;
>;                Physical Unit Number
>;
>;                0      1      2      3      4      5      6      7
>;
>; DLA DL0:   DL1:
>;
>;
>;
>; MS:   controllers: TS11, TU80, TSV05, TK25
>;
>;
>; DD:   controller: DL11           device: TU58
>;
>;
>; LP:   controllers: LA180, LN01, LP11, LS11, LV11
>;        devices:    LA180, LN01, LP01, LP02, LP04, LP05, LP06,
>;                  LP07, LP14, LP25, LP26, LP27, LS11, LV01
>;
>;
>; TT:   controllers: DL11, DLV11   controller mnemonic: YL
>;
>;
>; TT:   controllers: DZ11, DZQ11, DZV11   controller mnemonic: YZ
>;
>;
>;
>; =====
>; Assembling the Executive and Drivers      17-MAY-85 at 09:57
>; =====
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>;
>PIP RSXMC3.MAC=RSXMC1.MAC,RSXMC2.MAC
>PIP RSXMC.MAC=RSXMC3.MAC,RSXMC0.MAC
>;
>SET /UIC=[1,24]
>PIP [11,10]/NV=[200,200]RSXMC.MAC
>PIP [11,10]/NV=[200,200]SYSTB.MAC
>PIP [11,24]/NV=[200,200]RSXASM.CMD
>PIP [11,24]/NV=[200,200]DRIVERS.ASM
>;
>;
>ASN NL:=LS:
>;
>;
>SET /UIC=[11,24]
>;
>PIP *.OBJ;*/DE/NM,*.TTY;*
>;
>TIME
09:58:13 17-MAY-85
>;
>MAC @RSXASM
>;
>TIME
10:28:51 17-MAY-85
>;
>MAC @DRIVERS.ASM
>;
>TIME
10:40:03 17-MAY-85
>;
>PIP RSX11M.OBS=*.OBJ
>PIP TTDRV.OBS=*.TTY
>;
>SET /UIC=[200,200]
>PIP /NV=[11,10]RSXMC.MAC
>;
>SET /UIC=[1,24]
>PIP RSXBLD.CMD/PU/NM
>PIP RSX11M.OLB;*/DE/NM
>PIP [200,200]RSXMC.MAC/PU/NM
>;
>LBR RSX11M/CR:256.:256./-EP=[11,24]RSX11M.OBS
>;
>LBR TTDRV/CR:40.:392.:128.=[11,24]TTDRV.OBS
>SET /UIC=[200,200]
>;
>;
>;
>;=====
>; Building the Executive and Drivers      17-MAY-85 at 11:04
>;=====
>;
>;
>;
>; Allocate space to be used later for the system image file.
>;
>SET /UIC=[1,54]
>PIP RSX11M.TMP/CO/BL:1026.=NL:
>;
>SET /UIC=[200,200]
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>SET /UIC=[1,24]
>SET /UIC=[200,200]
>SET /UIC=[1,54]
>PIP SYSVMR.CMD=[200,200]SYSVMR.CMD,VMRTTY.CMD
>;
>SET /UIC=[200,200]
>;
>SET /UIC=[1,24]
>PIP [1,24]/NV/NM=[200,200]RSXBLD.CMD,RSX11M,DSP11M,LDR11M
>PIP [1,24]/NV=[200,200]DIR11M.CMD,DR211M,DIRCOM,DR2COM,DIR
>PIP [1,24]/NV=[200,200]DR311M.CMD,DR411M,DR3COM,DR4COM
>PIP [1,24]/NV=[200,200]VEC11M.CMD,DCM11M,VECCOM,DCMCOM
>;
>TIME
11:10:37 17-MAY-85
>;
>TKB @RSXBLD
>;
>TIME
11:35:47 17-MAY-85
>;
>TKB @[200,200]DRIVERS.BLD
>;
>TIME
11:42:49 17-MAY-85
>SET /UIC=[200,200]
>;
>;
>;
>;=====
>; Building the Privileged Tasks          17-MAY-85 at 11:42
>;=====
>;
>;
>;
>ASN NL:=MP:
>;
>SET /UIC=[1,24]
>;
>TIME
11:42:55 17-MAY-85
>;
>TKB @ACCFSLBLD
>TKB @ACDBLD
>TKB @ACNFSLBLD
>TKB @ACSFSBLD
>TKB @BOOBLD
>TKB @BPRBLD
>TKB @BROBLD
>TKB @BYEBLD
>TKB @COTFSLBLD
>TKB @DMOBLD
>TKB @ELIFSLBLD
>TKB @ERLBD
>TKB @FCPLRGLD
>TKB @FXRBLD
>TKB @F11MSGBLD
>TKB @HELFSLBLD
>TKB @HRCBLD
>TKB @INIBLD
>TKB @INSBLD
>TKB @LOABLD
>TKB @LPPFSLBLD

```

TWO SYSTEM GENERATION EXAMPLES

```

>TKB @MCRBLD
>TKB @MCDBLD
>TKB @MOUBLD
>TKB @MTABLD
>TKB @PMDFSLBLD
>TKB @PMTBLD
>TKB @PSWFSLBLD
>TKB @QMGFSLBLD
>TKB @RMDBLD
>TKB @SAVBLD
>TKB @SHABLD
>TKB @SHFBLD
>TKB @SHUBLD
>TKB @SYLFSLBLD
>TKB @TKNBLD
>TKB @UFDBLD
>TKB @UNLFSLBLD
>
>TIME
12:59:40 17-MAY-85
>
>ASN LB:=OU:
>SET /UIC=[200,200]
>
>
>
>=====
>; Building the Nonprivileged Tasks      17-MAY-85 at 12:59
>=====
>
>
>; Using saved answer file DM0:[200,200]SYSGENSA3.CMD;1
>; created on 17-MAY-85 at 09:46:11.
>
>
>
>
>=====
>; Creating the System Image File      17-MAY-85 at 12:59
>=====
>
>
>SET /UIC=[1,54]
>
>PIP RSX11M.TMP;*/DE/NM
>
>PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK
>
>ASN LB:=SY:
>VMR @SYSVMR
Loading Executive data space
Data space loading completed
VMR -- *DIAG*-Installed tasks or commons may no longer fit in partition
SET /TOP=SYSPAR:-*
VMR -- *DIAG*-Loadable driver larger than 4K
LOA TT:
VMR -- *DIAG*-Installed tasks or commons may no longer fit in partition
SET /TOP=DRVPAR:-*
SECPOL 117734 00203600 00100000 SEC POOL
SYSPAR 117670 00303600 00144000 MAIN
      117624 00303600 00074300 RO COM !DIR11M!
      117264 00400100 00004300 TASK [...LDR]
      116654 00404400 00030200 TASK [MCR...]
      116450 00434600 00007700 TASK [TKTN ]
      116244 00444500 00003100 TASK [SHF...]

```

TWO SYSTEM GENERATION EXAMPLES

```

DRVPAR 116164 00447600 00104100 MAIN
116120 00447600 00020100 RO COM !TTCOM !
116034 00467700 00030100 DRIVER (TT:)
115560 00520000 00005300 DRIVER (DR:)
115200 00525300 00005100 DRIVER (DM:)
114610 00532400 00003100 DRIVER (DL:)
114300 00535500 00004600 DRIVER (MS:)
113770 00542300 00003700 DRIVER (DD:)
113550 00546200 00001200 DRIVER (LP:)
113360 00547400 00000100 DRIVER (NL:)
113314 00547500 00000300 DRIVER (CO:)
113250 00550000 00002400 DRIVER (VT:)
113204 00552400 00001300 DRIVER (RD:)
GEN 113140 00553700 02224100 MAIN
...LDR 12.00 117500 SYSPAR 248. 00004300 LB0:-00124643 FIXED
TKTN 06.10 116514 SYSPAR 248. 00007700 LB0:-00130554 FIXED
FllMSG 14.00 111060 GEN 200. 00006200 LB0:-00126211
MTAACP 15.00 110464 GEN 200. 00016200 LB0:-00127515
SHE... 04.00 110214 GEN 200. 00014200 LB0:-00130002
MCR... 06.00 117124 SYSPAR 160. 00030200 LB0:-00126600 FIXED
FllACP 06.00 112724 GEN 149. 00014200 LB0:-00126133
ERRLOG 04.00 112364 GEN 148. 00057500 LB0:-00126047
PMT... 2.00 111724 GEN 148. 00007000 LB0:-00125426
COT... 2.0 111204 GEN 145. 00013300 LB0:-00125614
HRC... 03.00 110610 GEN 140. 00056300 LB0:-00126354
PMD... 07.00 110340 GEN 140. 00017500 LB0:-00126716
SYSLOG 03.00 111454 GEN 130. 00020400 LB0:-00130531
SHF... 6.00 116310 SYSPAR 105. 00003100 LB0:-00130022 FIXED
FXR... 02.00 110734 GEN 100. 00003200 LB0:-00126204
BAPO 04.00 112510 GEN 80. 00047200 LB0:-00125667
QMG... 03.01 111600 GEN 75. 00033700 LB0:-00127644
LPO 03.03 112144 GEN 70. 00014200 LB0:-00127106
ACNT 06.00 111330 GEN 50. 00051200 LB0:-00125450
SHUTUP 03.00 110070 GEN 50. 00015100 LB0:-00130027
...RMD 3.00 002074+ GEN 225. 00040600 LB0:-00130046
...DCL 24 002050+ GEN 160. 00055400 LB0:-00042203
...DMO 04.00 002052+ GEN 160. 00017000 LB0:-00125643
...MCR 04.03 002066+ GEN 160. 00040300 LB0:-00127154
...MOU 26.00 002070+ GEN 160. 00043600 LB0:-00126633
...CA. 14.00 002124+ GEN 150. 00025200 LB0:-00053251
...INS 14.00 002064+ GEN 100. 00047500 LB0:-00126526
...SAV 09.00 002120+ GEN 100. 00056400 LB0:-00130365
...UFD 06.00 002126+ GEN 100. 00014000 LB0:-00130566
...ACS 3.00 002102+ GEN 70. 00004100 LB0:-00125175
...ACC 03.01 002042+ GEN 65. 00031100 LB0:-00125235
...SHA 04.00 002122+ GEN 65. 00030400 LB0:-00130644
...AT. 7.0 002056+ GEN 64. 00054700 LB0:-00046405
...INI 23.00 002060+ GEN 60. 00035500 LB0:-00126434
...HOM 23.00 002062+ GEN 60. 00035500 LB0:-00126434
...BRO 06.00 002044+ GEN 50. 00036300 LB0:-00125554
...BYE 03.00 002046+ GEN 50. 00020100 LB0:-00125203
...HEL 3.01 002054+ GEN 50. 00032300 LB0:-00126224
...PIP 17.00 002072+ GEN 50. 00027200 LB0:-00050751
...UNL 5.0 002076+ GEN 50. 00036700 LB0:-00130735
...ACD 1.00 002100+ GEN 50. 00037500 LB0:-00125324
...BOO 06.02 002104+ GEN 50. 00033200 LB0:-00125517
...CON 03.00 002106+ GEN 50. 00130000 LB0:-00041740
...ELI 03.00 002110+ GEN 50. 00031300 LB0:-00126014
...LOA 5.1 002112+ GEN 50. 00036200 LB0:-00126775
...MAG 03.00 002114+ GEN 50. 00036100 LB0:-00125366
...PSW 02.00 002116+ GEN 50. 00015500 LB0:-00126745

```

TWO SYSTEM GENERATION EXAMPLES

```

RHA      OFL      CPA      CSR=176700      VEC=254 PRI=5
DMA      OFL      CPA      CSR=177440      VEC=210 PRI=5
YLA      OFL      CPA      CSR=177560      VEC=60  PRI=5
YLB      OFL      CPA      CSR=176510      VEC=310 PRI=5
YZA      OFL      CPA      CSR=160110      VEC=330 PRI=5
DLA      OFL      CPA      CSR=174400      VEC=160 PRI=5
MSA      OFL      CPA      CSR=172522      VEC=224 PRI=5
DDA      OFL      CPA      CSR=176500      VEC=300 PRI=4
LPA      OFL      CPA      CSR=177514      VEC=200 PRI=4
CO0:
TT0:     YLA0:      OFL      DRIVER
TT1:     YLB0:      OFL      DRIVER
TT2:     YZA0:      OFL      DRIVER
TT3:     YZA1:      OFL      DRIVER
TT4:     YZA2:      OFL      DRIVER
TT5:     YZA3:      OFL      DRIVER
TT6:     YZA4:      OFL      DRIVER
TT7:     YZA5:      OFL      DRIVER
TT10:    YZA6:      OFL      DRIVER
TT11:    YZA7:      OFL      DRIVER
VT0:
RD0:
DR0:     RHA0:      OFL      DRIVER
DM0:     DMA0:      OFL      DRIVER
DM1:     DMA1:      OFL      DRIVER
DL0:     DLA0:      OFL      DRIVER
DL1:     DLA1:      OFL      DRIVER
MS0:     MSA0:      OFL      DRIVER
DD0:     DDA0:      OFL      DRIVER
DD1:     DDA1:      OFL      DRIVER
LP0:     LPA0:      OFL      DRIVER
NL0:

```

POOL=1200:13242.:13242.:2036

>SET /UIC=[200,200]

>;

>REM MACT2

>REM PIPT2

>REM LBRT2

>REM TKBT2

>REM VMRT2

>;

>; End of SYSGEN

>;

>TIME

13:06:24 17-MAY-85

>;

>ASN =

>;

>@ <EOF>

>

>BOO [1,54] (RET)

XDT: 15

XDT>G

RSX-11M-PLUS V3.0 BL24

>TIM (RET)

13:15:05 17-MAY-85

>SAV (RET)

## TWO SYSTEM GENERATION EXAMPLES

```

RSX-11M-PLUS V3.0 BL24 384.KW System:"TSTSYS"
>RED DM:=SY:
>RED DM:=LB:
>RED DM:=SP:
>MOU DM:"RSX11MPBL24"
>@DM:[1,2]STARTUP
>;                                     PLEASE NOTE
>;
>;   If you have not yet read the system release notes do so now
>;   before attempting to perform an Update, a SYSGEN, or to
>;   utilize the new features of this system.
>;
>* Please enter time and date (HH:MM MM/DD/YY) [S]: CTRL Z
>@ <EOF>
>
>
>SAV/WB RET
DMO -- System disk being dismounted
DMO -- SYSTEM dismounted from DMO:    *** Final dismount initiated ***
13:15:26 *** DMO: -- Dismount complete
>

```

```

RSX-11M-PLUS V3.0 BL24 384.KW System:"TSTSYS"
>RED DM:=SY:
>RED DM:=LB:
>RED DM:=SP:
>MOU DM:"RSX11MPBL24"
>@DM:[1,2]STARTUP
>;                                     PLEASE NOTE
>;
>;   If you have not yet read the system release notes do so now
>;   before attempting to perform an Update, a SYSGEN, or to
>;   utilize the new features of this system.
>;
>* Please enter time and date (HH:MM MM/DD/YY) [S]: 13:16 5/17/85 RET
>TIME 13:16 5/17/85
>ACS SY:/BLKS=1024.
>CON ONLINE ALL
>ELI /LOG/LIM
>CLI /INIT=DCL/CTRLC
>INS LB:[3,54]RMSRES.TSK/RON=YES/PAR=GEN
>INS LB:[1,1]RMSLBA.TSK/RON=YES/PAR=GEN
>INS LB:[1,1]RMSLBB.TSK/RON=YES/PAR=GEN
>INS LB:[1,1]RMSLBC.TSK/RON=YES/PAR=GEN
>INS LB:[1,1]RMSLBD.TSK/RON=YES/PAR=GEN
>INS LB:[1,1]RMSLBE.TSK/RON=YES/PAR=GEN
>INS LB:[1,1]RMSLBF.TSK/RON=YES/PAR=GEN
>INS $QMGCLI
>INS $QMGCLI/TASK=...PRI
>INS $QMGCLI/TASK=...SUB
>QUE /START:QMG
>INS $QMGPR/TASK=PRT.../SLV=NO
>QUE LP0:/CR/NM
>START/ACCOUNTING
>CON ESTAT LP0:
>QUE LP0:/SP/FL:2/LOWER/FO:0
>QUE BAP0:/BATCH
>QUE LP0:/AS:PRINT
>QUE BAP0:/AS:BATCH
>@ <EOF>
>

```

## D.2 A SAMPLE ON-LINE SYSTEM GENERATION

```

>
>MOU MM0:/FOR/NOSHARE (RET)
>MOU DR0:/FOR/NOSHARE (RET)
>
>RUN $BAD (RET)
BAD>DR0:/LIST (RET)
BAD -- DR0: Bad block found - LBN= 38702.
BAD -- DR0: Bad block found - LBN= 55185.
BAD -- DR0: Bad block found - LBN= 62575.
BAD -- DR0: Bad block found - LBN= 83817.
BAD -- DR0: Total bad blocks= 4.
BAD> (CTRL/Z)
>
>RTN $BRU (RET)
BRU>/DENSITY:800/VERIFY/INITIALIZE/MAX:8099/HEA:4049 (RET)
From: MM0: (RET)
To: DR0: (RET)
BRU - Starting Tape 1 on MM0:

BRU - End of Tape 1 on MM0:

BRU - Starting verify pass Tape 1 on MM0:

BRU - End of Tape 1 on MM0:

BRU - Completed

BRU> (CTRL/Z)
>
>DMO DR0:/LOCK=NOUNLOAD (RET)
DMO -- TT36:  dismantled from DR0:  *** Final dismount initiated ***
>
>MOU DR0:RSX11MPBL24 (RET)
>ASN DR0:=SY: (RET)
>
>SET /UIC=[2,54] (RET)
>@BASTART (RET)
>;
>; RSX-11M-PLUS V3.0 On-line Distribution Kit Installation Procedure
>;
>; This command file installs the RSX-11M-PLUS V3.0 kit and
>; prepares it for performing a SYSGEN. It assumes the
>; current environment is an up-and-running RSX-11M-PLUS V3.0,
>; RSX-11M-PLUS V2.1, or VAX/VMS system. All the necessary devices
>; must already be configured on line. The current system will not
>; be affected in any way by the execution of this file.
>;
>ASN DR0:=SY:
>ASN DR0:=LB:
>;
>; The following information is necessary for this command file
>; to correctly access the remainder of the distribution kit.
>;
>* Did you receive your M-PLUS distribution kit on magnetic tape? [Y/N]: Y (RET)
>;
>; Please enter the name of the magnetic tape drive, which should
>; still contain the distribution tape. The name is of the form:
>;
>; M1: or
>; MS0: etc...
>;
>* Which tape drive contains the distribution tape [S]: MM0: (RET)
>* Do you have the 1600-bpi magnetic tape distribution kit? [Y/N]: N (RET)
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>; Prepare to bring in the remainder of the distribution kit
>;
>* Is your target system disk an RK07? [Y/N]: N (RET)
>;
>; Ensure that the BRU task is installed.
>;
>INS $BRU
>;
>; We will now load the remainder of the distribution kit.
>;
>TIME
15:28:22 16-MAY-85
>;
>BRU /BAC:MPBL24SRC/UFD/NOINI/DENS:800/VER MM0: SY:
BRU - Starting Tape 1 on MM0:

BRU - End of Tape 1 on MM0:

BRU - Starting Tape 2 on MM0:      ^

BRU - End of Tape 2 on MM0:

BRU - Mount Tape 1 on MM0:

BRU - Starting verify pass Tape 1 on MM0:

BRU - End of Tape 1 on MM0:

BRU - Mount Tape 2 on MM0:

BRU - Starting verify pass Tape 2 on MM0:

BRU - End of Tape 2 on MM0:

BRU - Completed

>;
>DMO MM0:/LOCK=UNLOAD
DMO -- TT36:   dismantled from MM0:   *** Final dismant initiated ***
>;
>TIME
16:34:55 16-MAY-85
>;
>; We will now create any UFDs that must be created on your disk(s).
>; You will not see the UFD commands.
>;
>TIME
16:34:59 16-MAY-85
>;
>;
>; The preparation of the RSX-11M-PLUS kit is now complete. The next
>; time this disk is bootstrapped, this dialog will only be repeated
>; on request. We will now record the successful installation in the
>; log file on the new system disk, and either exit if the installation
>; was done on line, or proceed with the normal startup sequence if the
>; baseline system was used.
>;
>SET /UIC=[2,54]
>PIP LB:[1,1]KITIDENT.DAT/AP=LB:[2,54]INSTALOG.DAT
>;
>;
>SET /UIC=[2,54]
>ASN =
>@ <EOF>
>
>

```

TWO SYSTEM GENERATION EXAMPLES

```

>ASN DR0:=SY:
>SET /UIC=[200,200]
>
>
>@SYSGEN (RET)
>;
>; RSX-11M-PLUS SYSGEN BL24
>;
>; COPYRIGHT (c) 1985
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>;
>;
>; To exit from the SYSGEN procedure at any time, type CTRL/Z.
>;
>; If you are unsure of the answer to a question for which a de-
>; fault answer exists, use the default answer.
>;
>;
>;
>;=====
>; Choosing SYSGEN Options      16-MAY-85 at 16:49
>;=====
>;
>;
>; Every question is preceded by a question number (for example SU010)
>; which you can use to find the explanation of the question in the
>; RSX-11M-PLUS System Generation and Installation Guide.
>;
>; An explanation of every question is also available by pressing
>; the ESC key (or the ALTMODE key) in response to the question.
>;
>; If you are unfamiliar with the SYSGEN procedure, the explanation of
>; each question can be printed automatically before the question.
>;
>* SU010 Do you always want the explanation printed? [Y/N D:N]: (RET)
>;
>; SYSGEN always creates saved answer files containing your responses
>; to the SYSGEN questions:
>;
>;   SYSGENSA1.CMD      Setup questions, Executive options
>;   SYSGENSA2.CMD      Peripheral configuration
>;   SYSGENSA3.CMD      Nonprivileged task builds
>;
>; You should perform a PREPGEN first to create saved answer files, and
>; then perform a SYSGEN, specifying those saved answer files as input
>; to the Executive, peripheral, and nonprivileged task build sections.
>;
>* SU020 Do you want to use a saved answer file as input for
>* the Executive options? [Y/N D:N]: (RET)
>;
>* SU040 Do you want to use a saved answer file as input for
>* the peripheral configuration? [Y/N D:N]: (RET)
>;
>* SU060 Do you want to use a saved answer file as input for
>* the nonprivileged task builds? [Y/N D:N]: (RET)
>;
>* SU080 Do you want to do a PREPGEN? [Y/N D:N]: Y (RET)
>;
>* SU090 Enter the name of the disk drive containing your
>* target system disk [ddnn:] [S R:2-5]: DRU: (RET)
>;
>ASN DR0:=IN:
>ASN DR0:=OU:
>ASN DR0:=LB:
>ASN DR0:=WK:

```

TWO SYSTEM GENERATION EXAMPLES

```

>ASN DR0:=TK:
>ASN DR0:=BC:
>ASN DR0:=LI:
>ASN DR0:=OB:
>ASN DR0:=EX:
>ASN DR0:=MP:
>;
>; You can:
>;
>;     • do a complete SYSGEN
>;
>;     • continue a previous SYSGEN from where you left off
>;
>;     • do an individual section of SYSGEN
>;
>;
>* SU120   Do you want to do a complete SYSGEN? [Y/N D:Y]:  (RET)
>;
>!INS [3,54]MAC/TASK=MACT36
>!INS [3,54]PIP/TASK=PIPT36
>!INS [3,54]LBR/TASK=LBRT36
>!INS [3,54]TKB/TASK=TKBT36
>!INS [3,54]VMR/TASK=VMRT36
>;
>;
>;
>;=====
>;  Choosing Executive Options           16-MAY-85 at 16:49
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSAL.CMD.
>;
>; Enter a comment for inclusion in the SYSGENSAL saved answer file.
>; The comment may contain more than one line.  The "V" in the right
>; margin below marks the maximum line length.  When you are done,
>; press RETURN in response to the prompt.
>;
>* Comment [S R:0.-55.]:  Example SYSGEN.  (RET)
>* Comment [S R:0.-55.]:  (RET)
>;
>* CE010   What is your target processor type? [S R:5.-12. D:"11/70"]:  11/24 (RET)
>;
>* CE020   Do you want the Full-functionality Executive? [Y/N D:Y]:  N (RET)
>;
>;     The User-tailored Executive will require you to answer at least
>;     twenty additional questions specifying which standard RSX-11M-PLUS
>;     features you wish to disable.  You should not choose the User-tailored
>;     Executive unless you need to disable specific RSX-11M-PLUS features.
>;
>;
>* CE030   Do you want to reconsider your selection? [Y/N D:N]:  (RET)
>;
>* CE070   Do you want support for task headers out-of-pool? [Y/N D:N]:  Y (RET)
>;
>* CE075   Do you want extended logical name support? [Y/N D:N]:  Y (RET)
>;
>* CE090   Do you want to use FCSRES, the FCS resident library? [Y/N D:N]:  Y (RET)
>;
>* CE094   Do you want support for the fast map facility? [Y/N D:N]:  (RET)
>;
>* CE100   Do you want all DIGITAL-supplied drivers and their data bases
>*         to be loadable? [Y/N D:N]:  Y (RET)
>;

```

V

## TWO SYSTEM GENERATION EXAMPLES

```

>* CE120 Do you want support for communications products
>* (such as DECnet, PSI, and LAT)? [Y/N D:N]: Y (RET)
>;
>* CE122 Do you want host support for LAT terminal servers? [Y/N D:N]: Y (RET)
>;
>* CE130 What is the system name? [S R:0-6 D:"RSXMPL"]: EXMPL2 (RET)
>;
>* CE140 Do you want shadow recording support? [Y/N D:N]: (RET)
>;
>* CE145 Do you want disk data caching support? [Y/N D:N]: Y (RET)
>;
>* CE150 Do you want console driver support? [Y/N D:N]: (RET)
>;
>* CE160 Do you want accounting support? [Y/N D:N]: Y (RET)
>;
>* CE170 Do you want to include the batch processor? [Y/N D:N]: Y (RET)
>;
>* CE194 Do you want CTRL/C abort support? [Y/N D:N]: Y (RET)
>;
>* CE200 Which FCP do you want? [S R:1-6 D:"FCPLRG"]: (ESC)
>;
>; Two versions of the file system ACP (FllACP) are provided:
>;
>; FCPMDL -- a 5K overlaid FCP that gives good performance
>; for systems with limited memory
>;
>; FCPLRG -- a 9K nonoverlaid FCP that gives high performance
>;
>; Both versions provide the same functionality.
>;
>* CE200 Which FCP do you want? [S R:1-6 D:"FCPLRG"]: (RET)
>;
>* CE210 Do you want support for file windows in secondary pool? [Y/N D:N]: (ESC)
>;
>; This option allows the FCP to put file windows in secondary pool
>; instead of primary pool. This increases the amount of primary pool
>; available for other system functions.
>;
>* CE210 Do you want support for file windows in secondary pool? [Y/N D:N]: Y (RET)
>;
>* CE214 Do you want decimal version numbers in
>* file specifications? [Y/N D:N]: Y (RET)
>;
>* CE230 What is the default virtual terminal unit buffer
>* size? [D R:1.-512. D:120.]: (RET)
>;
>* CE240 What is the maximum virtual terminal unit buffer
>* size? [D R:1.-512. D:184.]: (RET)
>;
>* CE250 Do you want character translation support? [Y/N D:N]: (RET)
>;
>* CE260 Enter unsolicited input time-out (in seconds) [D R:0.-255. D:30.]: (RET)
>;
>* CE264 Do you want IPL1 industrial I/O subsystem support? [Y/N D:N]: (RET)
>;
>* CE270 Do you want to include XDT? [Y/N D:N]: Y (RET)
>;
>* CE280 Enter the crash notification device CSR
>* address [O R:160000-177700 D:177564]: (RET)
>;
>; Note: Enter both the device and the logical unit number.
>; For example, MM0: or DL1:.
>;
>* CE290 On what device and unit do you want crash dumps
>* to be written? [S R:2-6]: MM0: (RET)
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>* CE310 Enter memory size (in K words) [D R:128.-1920. D:256.]: (RET)
>;
>* CE320 Do you want floating point processor support? [Y/N D:N]: Y (RET)
>;
>* CE330 Is your system clock programmable (KW11-P)? [Y/N D:N]: (RET)
>;
>* CE350 Is your line frequency 50 Hz? [Y/N D:N]: (RET)
>;
>;
>;
>;=====
>; Choosing Peripheral Configuration 16-MAY-85 at 16:51
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA2.CMD.
>;
>; Enter a comment for inclusion in the SYSGENSA2 saved answer file.
>; The comment may contain more than one line. The "v" in the right
>; margin below marks the maximum line length. When you are done,
>; press RETURN in response to the prompt.
>;
>* Comment [S R:0.-55.]: Example SYSGEN. (RET)
>* Comment [S R:0.-55.]: (RET)
>;
>;
>;
>* CP0604 How many RH controllers do you have? [D R:0.-15. D:4.]: 3 (RET)
>;
>* CP0612 Do you want to generate a mixed MASSBUS configuration? [Y/N D:N]: (RET)
>;
>;
>; DB: controllers: RH11, RH70 devices: RP04, RP05, RP06
>;
>* CP0808 How many RP04/05/06 disk drives do you have? [D R:0.-63. D:0.]: (RET)
>;
>;
>; DR: controllers: RH11, RH70 devices: RM02
>; RH70 RM03, RM05, RM80, RP07
>;
>;
>* CP1008 How many RM02/03/05/80/RP07 disk drives do you
>* have? [D R:0.-63. D:0.]: 4 <RET>
>;
>* CP1020 Are any of the units dual-access? [Y/N D:N]: (ESC)
>;
>; A dual-access unit is one that is connected to two controllers
>; at one time, and may be accessed from either controller at the
>; option of the system software. Since a single device unit may
>; have only one physical unit number, a dual-access unit must be
>; attached to both controllers with the same unit number.
>;
>* CP1020 Are any of the units dual-access? [Y/N D:N]: Y (RET)
>;
>;
>* CP1036 What is the physical unit number of DR0:? [O R:0-7 D:0]: (RET)
>;
>* CP1040 Is DR0: a dual-access unit? [Y/N D:N]: Y (RET)
>;
>* CP1048 To which RH controller is port A of DR0: connected? [S R:1-1]: A (RET)
>;
>* CP1048 To which RH controller is port B of DR0: connected? [S R:1-1]: B (RET)
>;
>* CP1060 Is DR0: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02 (RET)
>;
>;

```

V

TWO SYSTEM GENERATION EXAMPLES

```

>* CP1036 What is the physical unit number of DR1:? [O R:0-7 D:1]: (RET)
>;
>* CP1040 Is DR1: a dual-access unit? [Y/N D:N]: Y (RET)
>;
>* CP1048 To which RH controller is port A of DR1: connected? [S R:1-1]: A (RET)
>;
>* CP1048 To which RH controller is port B of DR1: connected? [S R:1-1]: B (RET)
>;
>* CP1060 Is DR1: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02 (RET)
>;
>;
>* CP1036 What is the physical unit number of DR2:? [O R:0-7 D:2]: (RET)
>;
>* CP1040 Is DR2: a dual-access unit? [Y/N D:N]: Y (RET)
>;
>* CP1048 To which RH controller is port A of DR2: connected? [S R:1-1]: A (RET)
>;
>* CP1048 To which RH controller is port B of DR2: connected? [S R:1-1]: B (RET)
>;
>* CP1060 Is DR2: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02 (RET)
>;
>;
>* CP1036 What is the physical unit number of DR3:? [O R:0-7 D:3]: (RET)
>;
>* CP1040 Is DR3: a dual-access unit? [Y/N D:N]: Y (RET)
>;
>* CP1048 To which RH controller is port A of DR3: connected? [S R:1-1]: A (RET)
>;
>* CP1048 To which RH controller is port B of DR3: connected? [S R:1-1]: B (RET)
>;
>* CP1060 Is DR3: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02 (RET)
>;
>;
>; DS: controllers: RH11, RH70 devices: RS03, RS04
>;
>* CP1208 How many RS03/04 disk drives do you have? [D R:0.-63. D:0.]: (RET)
>;
>;
>; EM: controllers: RH11, RH70 device: ML11
>;
>* CP1408 How many ML11 disks do you have? [D R:0.-63. D:0.]: (RET)
>;
>;
>; MM: controllers: RH11, RH70 devices: TE16, TU16, TU45, TU77
>; formatters: TM02, TM03
>;
>* CP1608 How many TU16/45/77/TE16 tape drives do you
>* have? [D R:0.-192. D:0.]: 5 (RET)
>;
>* CP1612 How many TM02/03 magtape formatters do you
>* have? [D R:1.-5. D:1.]: (ESC)
>;
>; Each TU16/45/77/TE16 drive unit is interfaced to the RH MASSBUS
>; controller through a TM02/03 magtape formatter. A single formatter
>; is connected to the MASSBUS as one physical unit, and in turn will
>; support up to eight drives.
>;
>; The formatter and the first drive interfaced to it are called
>; the "master drive" unit. Any additional drives on the formatter
>; are called "slave drive" units.
>;
>; The TM02/03 formatter is usually located behind the lower front
>; door of the master drive. It has a white physical unit number plug
>; inserted into it. (Do not confuse it with the power supply.)
>;

```



TWO SYSTEM GENERATION EXAMPLES

```

>;
>;
>; DK: controller: RK11 devices: RK05, RK05F
>;
>* CP2204 How many RK11 cartridge disk controllers do you have? [O D:0]: (RET)
>;
>;
>; DM: controllers: RK611, RK711 devices: RK06, RK07
>;
>* CP2404 How many RK611/711 disk cartridge controllers do
>* you have? [O D:0]: (RET)
>;
>;
>; DL: controllers: RL11, RLV12 devices: RL01, RL02
>;
>* CP2604 How many RL11/RLV11 disk cartridge controllers do
>* you have? [O D:0]: 1 (RET)
>;
>* CP2608 How many RL01/RL02 disk drives do you have? [D R:1.-63. D:1.]: 2 (RET)
>;
>;
>* CP2636 What is the physical unit number of DL0:? [O R:0-7 D:0]: (RET)
>;
>* CP2660 Is DL0: an RL01 or RL02? [S R:4-4 D:"RL02"]: (RET)
>;
>;
>* CP2636 What is the physical unit number of DL1:? [O R:0-7 D:1]: (RET)
>;
>* CP2660 Is DL1: an RL01 or RL02? [S R:4-4 D:"RL02"]: (RET)
>;
>;
>* CP2668 Enter the vector address of DLA [O R:60-774 D:160]: (RET)
>;
>* CP2672 What is its CSR address? [O R:160000-177700 D:174400]: (RET)
>;
>; DL Configuration
>;
>; Physical Unit Number
>;
>; 0 1 2 3 4 5 6 7
>;
>; DLA DL0: DL1:
>;
>;
>;
>; DP: controller: RP11 devices: RP02, RPR02, RP03
>;
>* CP2804 How many RP11 disk pack controllers do you have? [O D:0]: (RET)
>;
>;
>; DU: controllers: RQDX1, RQDX2, RUX50, RQC25, RUC25, KDA50, UDA50
>; devices: RX50, RD51, RD52, RC25, RA60, RA80, RA81
>;
>* CP3004 How many MSCP disk controllers do you have? [D R:0.-16. D:0.]: (RET)
>;
>;
>; MU: controllers: TK50, TU81
>;
>* CP3404 How many TMSCP tape controllers do you have? [D R:0.-16. D:0.]: (RET)
>;
>;
>; CR: controllers: CM11, CR11
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>* CP4004 How many CM/CR11 card readers do you have? [O D:0]: (RET)
>;
>;
>; CT: controller: TA11 device: TU60
>;
>* CP4204 How many TA11 dual cassettes do you have? [O D:0]: (RET)
>;
>;
>; MS: controllers: TS11, TU80, TSV05, TK25
>;
>* CP4404 How many TS11/TU80/TSV05/TK25
>* magtape controllers do you have? [O D:0]: (RET)
>;
>;
>; DT: controller: TC11 device: TU56
>;
>* CP4604 How many TC11 DEctape controllers do you have? [O D:0]: (RET)
>;
>;
>; DX: controller: RX11 device: RX01
>;
>* CP4804 How many RX11 disk controllers do you have? [O D:0]: (RET)
>;
>;
>; DY: controller: RX211, RXV21 device: RX02
>;
>* CP5004 How many RX211/RXV21 disk controllers do you have? [O D:0]: 1 (RET)
>;
>* CP5068 Enter vector address of the next RX211/RXV21 [O R:60-774 D:264]: (RET)
>;
>* CP5072 What is its CSR address? [O R:160000-177700 D:177170]: (RET)
>;
>* CP5076 How many drives does DYA have? [D R:1.-2. D:2.]: (RET)
>;
>;
>; DD: controller: DL11 device: TU58
>;
>* CP5204 How many TU58 controllers do you have? [O D:0]: (RET)
>;
>;
>; LP: controllers: LA180, LN01, LP11, LS11, LV11
>; devices: LA180, LN01, LP01, LP02, LP04, LP05, LP06,
>; LP07, LP14, LP25, LP26, LP27, LS11, LV01
>;
>* CP5404 How many LP/LS/LV11/LA180 line printers do you have? [O D:0]: 1 (RET)
>;
>* CP5408 Enter the number of seconds between
>* line printer-not-ready messages [D R:0.-255. D:15.]: 240. (RET)
>;
>* CP5468 Enter vector address of the next line
>* printer [O R:60-774 D:200]: (RET)
>;
>* CP5472 What is its CSR address? [O R:160000-177700 D:177514]: (RET)
>;
>* CP5480 Enter line printer type for LPA [S R:4-5 D:"LP25"]:(ESC)
>;
>; Here is a table of the valid line printer types and their
>; characteristics:
>;
>; printer of lines per supports
>; type controller columns minute optimization
>;
>; LA180 LA180 132 150 no
>; LN01 LN01 132 600 NA
>; LP01 LP11-F/H 80 170-1110 yes
>; LP02 LP11-J/K 132 170-1110 yes

```

TWO SYSTEM GENERATION EXAMPLES

```

>;      LP04      LP11-R/S      132      1110      yes
>;      LP05      LP11-V/W      132      300      no
>;      LP06      LP11-Y/Z      132      460-600    no
>;      LP07      LP11-G      132      1200    no
>;      LP14      LP11-C/D      132      660-900    no
>;      LP25      LP11-A/B      132      215-300    no
>;      LP26      LP11-E      132      445-600    no
>;      LP27      LP11-U      132      800-1200   no
>;      LS11      LS11      132      60-200     no
>;      LV01      LV11      132      500      yes
>;
>; The printer type is used to set two characteristics in the UCB:
>;
>; • Column or buffer width
>;
>; This is settable in VMR or MCR with the SET /BUF command.
>;
>;
>; • Fast line printer support
>;
>; This is an optimization performed by the driver to eliminate
>; unnecessary print cycles. This characteristic is not settable
>; in VMR or MCR.
>;
>; If you specify the wrong printer type and the driver performs
>; the optimization for a printer that does not support it, you
>; will occasionally lose a line of a listing when the printer
>; is taken off line.
>;
>; If you specify the wrong printer type and the driver does not
>; perform the optimization for a printer that supports it, the
>; printer will run a little slower than it would with the
>; optimization, but there will be no other adverse effects.
>;
>; If you do not know the correct printer type for your printer, take
>; the default. This will give you a 132-column printer without fast
>; printer optimization. Once your system is running, you can change
>; the number of columns if necessary with the MCR SET command.
>;
>* CP5480 Enter line printer type for LPA [S R:4-5 D:"LP25"]:  

>;
>* CP5484 Does LPA have lowercase characters? [Y/N D:N]: Y  

>;
>; MT: controllers: TM11, TMA11, TMB11 devices: TE10, TU10, TU10W, TS03
>;
>* CP5604 How many TM/TMA/TMB11 magtape controllers do you have? [0 D:0]:  

>;
>; PP: controller: PC11
>;
>* CP5804 How many PC11 paper tape reader/punches do you have? [0 D:0]:  

>;
>; PR: controller: PR11
>;
>* CP6004 How many PR11 paper tape readers do you have? [0 D:0]:  

>;
>; LA: controller: LPA11
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>* CP6204 How many LPA11 lab subsystems do you have? [D R:0.-16. D:0.]: (RET)
>;
>;
>; TT: controllers: DL11, DLV11 controller mnemonic: YL
>;
>* CP6804 Enter number of additional DL11/DLV11 line interfaces [O D:0]: (RET)
>;
>* CP6832 Enter terminal type for YLA [S R:4-6 D:"LA120"]: (RET)
>;
>;
>; TT: controller: DH11 controller mnemonic: YH
>;
>* CP7004 Enter number of DH11 asynchronous line
>* multiplexers [D R:0.-16. D:0.]: (RET)
>;
>;
>; TT: controllers: DHU11, DHV11 controller mnemonic: YV
>;
>* CP7104 Enter number of DHU11/DHV11 asynchronous line
>* multiplexers [D R:0.-16. D:0.]: 1 (RET)
>;
>* CP7120 Enter total number of DHU11/DHV11 dial-up lines [D R:0.-16. D:0.]: 4 (RET)
>;
>* CP7128 At which baud rate do you want to answer? [S R:2-5 D:"300"]: (RET)
>;
>* CP7140 Enter total number of DHU11/DHV11 local lines [D R:0.-12. D:0.]: 12 (RET)
>;
>* CP7168 Enter vector address of YVA [O R:300-770]: 310 (RET)
>;
>* CP7172 What is its CSR address? [O R:160000-177700]: 160020 (RET)
>;
>* CP7184 Enter terminal type for YVA [S R:4-6 D:"VT100"]: (ESC)
>;
>; The terminal types supported by RSX-11M-PLUS SYSGEN are:
>;
>; ASR33 LA12 VT05B
>; ASR35 LA30P VT50
>; LA30S VT52
>; DTC01 LA34 VT55
>; LA36 VT61
>; KSR33 LA38 VT100
>; LA50 VT101
>; LA100 VT102
>; LA120 VT105
>; LA180S VT125
>; LN03 VT131
>; VT132
>; PC3xx VT2xx
>;
>* CP7184 Enter terminal type for YVA [S R:4-6 D:"VT100"]: VT2xx (RET)
>;
>;
>; TT: controller: DJ11 controller mnemonic: YJ
>;
>* CP7204 Enter number of DJ11 asynchronous line
>* multiplexers [D R:0.-15. D:0.]: (RET)
>;
>;
>; TT: controllers: DZ11, DZQ11, DZV11 controller mnemonic: YZ
>;
> CP7404 Enter number of DZ11/DZQ11/DZV11 asynchronous line
>* multiplexers [D R:0.-30. D:0.]: (RET)
>;

```

## TWO SYSTEM GENERATION EXAMPLES

```

>;
>* CP7604 Do you have any intercomputer communication devices? [Y/N D:N]: (RET)
>;
>;
>; Enter device mnemonics for any user-supplied drivers. The driver
>; source files must reside in [11,10] and be named ddDRV.MAC and
>; ddTAB.MAC where dd is the device mnemonic.
>;
>; You may enter the mnemonics on more than one line. When you have
>; listed all the drivers, press RETURN when asked for the device
>; mnemonic.
>;
>; The device mnemonic must not include a colon.
>;
>* CP9604 Enter device mnemonics for user-supplied drivers [S]: JA (RET)
>* CP9604 Enter device mnemonics for user-supplied drivers [S]: (RET)
>;
>* CP9612 Do you want the JA: driver to be loadable? [Y/N D:N]: Y (RET)
>;
>* CP9616 Do you want the JA: driver's data base to be loadable? [Y/N D:N]: Y (RET)
>;
>; SGN -- Warning: JADRV.MAC is not in [11,10] on the target system
>; disk. It must be put there before the Executive is assembled.
>;
>;
>; SGN -- Warning: JATAB.MAC is not in [11,10] on the target system
>; disk. It must be put there before the Executive is assembled.
>;
>;
>;
>; The highest vector among the devices you specified in this SYSGEN
>; is 374(octal). This is the default response for this question.
>;
>* CP9632 What is the highest interrupt vector
>* address? [O R:374-774 D:374]: (RET)
>;
>;
>;
>;=====
>; Assembling the Executive and Drivers 16-MAY-85 at 17:00
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>!PIP RSXMC3.MAC=RSXMC1.MAC,RSXMC2.MAC
>!PIP RSXMC.MAC=RSXMC3.MAC,RSXMC0.MAC
>;
>!SET /UIC=[1,24]
>!PIP [11,10]/NV=[200,200]RSXMC.MAC
>!PIP [11,10]/NV=[200,200]SYSTB.MAC
>!PIP [11,24]/NV=[200,200]RSXASM.CMD
>!PIP [11,24]/NV=[200,200]DRIVERS.ASM
>;
>;
>* AE010 Do you want assembly listings of the Executive and
>* drivers? [Y/N D:N]: N (RET)
>;
>!ASN NL:=LS:
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>;
>* AE030 Do you wish to pause to edit any files before
>* assembling? [Y/N D:N]: Y (RET)
>;
>; SYSGEN will now pause to let you edit any files before assembling
>; the Executive and drivers.
>;
>;
>!SET /UIC=[11,24]
>;
>!PIP *.OBJ;*/DE/NM,*.TTY;*
>;
>!TIME
>;
>!MAC @RSXASM
>;
>!TIME
>;
>!MAC @DRIVERS.ASM
>;
>!TIME
>;
>!PIP RSX11M.OBS=*.OBJ
>!PIP TTDRV.OBS=*.TTY
>;
>!SET /UIC=[200,200]
>!PIP /NV=[11,10]RSXMC.MAC
>;
>!SET /UIC=[1,24]
>!PIP RSXBLD.CMD/PU/NM
>!PIP RSX11M.OLB;*/DE/NM
>!PIP [200,200]RSXMC.MAC/PU/NM
>;
>!LBR RSX11M/CR:256.:256./-EP=[11,24]RSX11M.OBS
>;
>!LBR TTDRV/CR:40.:392.:128.=[11,24]TTDRV.OBS
>;
>;
>;=====
>; Building the Executive and Drivers 16-MAY-85 at 17:02
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>;
>; Allocate space to be used later for the system image file.
>;
>!SET /UIC=[1,54]
>!PIP RSX11M.TMP/CO/BL:1026.=NL:
>;
>;
>!SET /UIC=[1,54]
>!PIP SYSVMR.CMD=[200,200]SYSVMR.CMD,VMRTTY.CMD
>;
>;
>* BE030 Do you want to pause to edit any files before
>* task-building? [Y/N D:N]: (RET)
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>!SET /UIC=[1,24]
>!PIP [1,24]/NV/NM=[200,200]RSXBLD.CMD,RSX11M,DSP11M,LDR11M
>!PIP [1,24]/NV=[200,200]DIR11M.CMD,DR211M,DIRCOM,DR2COM,DIR
>!PIP [1,24]/NV=[200,200]DR311M.CMD,DR411M,DR3COM,DR4COM
>!PIP [1,24]/NV=[200,200]VECL1M.CMD,DCM11M,VECCOM,DCMCOM
>;
>!TIME
>;
>!TKB @RSXBLD
>;
>!TIME
>;
>!TKB @[200,200]DRIVERS.BLD
>;
>!TIME
>;
>;
>;=====
>; Building the Privileged Tasks      16-MAY-85 at 17:03
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>;
>* BP040   Do you want the maps of the privileged tasks? [Y/N D:N]: Y (RET)
>;
>* BP050   What is to be the map device [ddu:]? [S R:2-5 D:"SY:"]: (RET)
>;
>!ASN SY:=MP:
>;
>!SET /UIC=[1,24]
>;
>!TIME
>;
>!TKB @ACCRESBLD
>!TKB @ACNRESBLD
>!TKB @ACSRESBLD
>!TKB @BOOBLD
>!TKB @BPRBLD
>!TKB @BROBLD
>!TKB @BYEBLD
>!TKB @DMOBLD
>!TKB @ELIRESBLD
>!TKB @ERLBLD
>!TKB @FCPLRGBLD
>!TKB @FXRBLD
>!TKB @FLMSGBLD
>!TKB @HELRESBLD
>!TKB @HRCBLD
>!TKB @INIBLD
>!TKB @INSBLD
>!TKB @LOABLD
>!TKB @LPPRESBLD
>!TKB @MCRBLD
>!TKB @MCRBLD
>!TKB @MCRBLD
>!TKB @MOUBLD
>!TKB @MTABLD
>!TKB @PMDRESBLD
>!TKB @PMTBLD

```

TWO SYSTEM GENERATION EXAMPLES

```

>!TKB @PSWRESBLD
>!TKB @QMGRESBLD
>!TKB @RMDBLD
>!TKB @SAVBLD
>!TKB @SHFBLD
>!TKB @SHUBLD
>!TKB @SYLRESBLD
>!TKB @TKNBLD
>!TKB @UFDBLD
>!TKB @UNLRESBLD
>;
>!TIME
>;
>!ASN LB:=OU:
>;
>;
>;
>;=====
>; Building the Nonprivileged Tasks      16-MAY-85 at 17:03
>;=====
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA3.CMD.
>;
>;
>* BN010 Do you want to rebuild any nonprivileged tasks? [Y/N D:N]: Y (RET)
>;
>; Enter a comment for inclusion in the SYSGENSA3 saved answer file.
>; The comment may contain more than one line. The "V" in the right
>; margin below marks the maximum line length. When you are done,
>; press RETURN in response to the prompt.
>;
>* Comment [S R:0.-55.]: Example SYSGEN. (RET)
>* Comment [S R:0.-55.]: (RET)
>;
>; The following nonprivileged tasks and utilities can be built at this time:
>;
>;      BAD          DMPFSL          IOX          RPT
>;      BRU          DSC            IOXRES       RPTFSL
>;      CDA          EDI            IOXFSL       SLP
>;      CDARES       EDIRES       LBR          SLPRES
>;      CDAFSL       EDIFSL       LBRRES      SLPFSL
>;      CFL          EDT            LBRFSL      STK
>;      CFLFSL       EDTRES       MAC          STKFSL
>;      CMP          EDTFSL       MACRES      TDX
>;      CMPRES       FLX          MACFSL      TKB
>;      CMPFSL       FLXRES      MFT         TKBRES
>;      CON          FLXFSL       PAT         TKBFSL
>;      CRF          FMT          PATRES      VFY
>;      CRFRES       FTB          PATFSL      VFYRES
>;      CRFFSL       FTBRES      PIP         VFYFSL
>;      DCL          FTBFSL       PIPRES      VMR
>;      DLD          ICM          PIPFSL      ZAP
>;      DMP          ICMRES      QMGCLI      ZAPRES
>;      DMPRES       ICMFSL      QMGPRT      ZAPFSL
>;
>; Press ESC to repeat this list of all the nonprivileged tasks
>; and utilities.
>;
>; Enter ALL to build all the non-FCSRES and non-FCSFSL tasks.
>; Enter ALLRES to build all the FCSRES tasks. Enter ALLFSL to
>; build all the FCSFSL tasks.
>;

```

V

TWO SYSTEM GENERATION EXAMPLES

```

>; Enter the task names separated by commas. You can enter them on
>; more than one line. When you are done, finish the list with a
>; period or press RETURN in response to the prompt.
>;
>* BN020 Enter task name(s) [S]: ICMRES,TKBRES (RET)
>* Enter task name(s) [S]: (RET)
>;
>;
>* BN024 What is the library directory of the target
>* system? [S R:3.-11. D:"[3,54]"]: (RET)
>;
>;
>* BN030 Do you want the maps of the nonprivileged tasks? [Y/N D:N]: (RET)
>;
>!ASN NL:=MP:
>;
>* BN050 Do you want to pause to edit any files before
>* task-building? [Y/N D:N]: (RET)
>;
>!SET /UIC=[1,24]
>;
>!TKB @ICMRESBLD
>!TKB @TKBRESBLD
>;
>;
>;
>;=====
>; Creating the System Image File 16-MAY-85 at 17:04
>;=====
>;
>;
>!SET /UIC=[1,54]
>;
>!PIP RSX11M.TMP;*/DE/NM
>;
>!PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK
>;
>!ASN LB:=SY:
>!VMR @SYSVMR
>;
>!REM MACT36
>!REM PIPT36
>!REM LBRT36
>!REM TKBT36
>!REM VMRT36
>;
>; End of PREPGEN
>;
>TIME
17:04:46 16-MAY-85
>;
>ASN =
>;
>@ <EOF>
>
>
>ASN DR:=SY: (RET)
>SET /UIC=[200,200] (RET)
>
>
>@SYSGEN (RET)
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>; RSX-11M-PLUS  SYSGEN  BL24
>;
>; COPYRIGHT (c)  1985
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>;
>;
>; To exit from the SYSGEN procedure at any time, type CTRL/Z.
>;
>; If you are unsure of the answer to a question for which a de-
>; fault answer exists, use the default answer.
>;
>;
>;
>;=====
>;  Choosing SYSGEN Options          16-MAY-85 at 17:07
>;=====
>;
>;
>; Every question is preceded by a question number (for example SU010)
>; which you can use to find the explanation of the question in the
>; RSX-11M-PLUS System Generation and Installation Guide.
>;
>; An explanation of every question is also available by pressing
>; the ESC key (or the ALTMODE key) in response to the question.
>;
>; If you are unfamiliar with the SYSGEN procedure, the explanation of
>; each question can be printed automatically before the question.
>;
>* SU010  Do you always want the explanation printed? [Y/N D:N]:  (RET)
>;
>; SYSGEN always creates saved answer files containing your responses
>; to the SYSGEN questions:
>;
>;   SYSGENSA1.CMD      Setup questions, Executive options
>;   SYSGENSA2.CMD      Peripheral configuration
>;   SYSGENSA3.CMD      Nonprivileged task builds
>;
>; You should perform a PREPGEN first to create saved answer files, and
>; then perform a SYSGEN, specifying those saved answer files as input
>; to the Executive, peripheral, and nonprivileged task build sections.
>;
>* SU020  Do you want to use a saved answer file as input for
>; the Executive options? [Y/N D:N]:  Y (RET)
>;
>* SU030  Enter saved answer file name [S D:"SYSGENSA1.CMD"]:  (RET)
>;
>* SU040  Do you want to use a saved answer file as input for
>; the peripheral configuration? [Y/N D:N]:  Y (RET)
>;
>* SU050  Enter saved answer file name [S D:"SYSGENSA2.CMD"]:  (RET)
>;
>* SU060  Do you want to use a saved answer file as input for
>; the nonprivileged task builds? [Y/N D:N]:  Y (RET)
>;
>* SU070  Enter saved answer file name [S D:"SYSGENSA3.CMD"]:  (RET)
>;
>* SU080  Do you want to do a PREPGEN? [Y/N D:N]:  (RET)
>;
>* SU090  Enter the name of the disk drive containing your
>; target system disk.[ddnn:] [S R:2-5]:  DR0: (RET)
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>ASN DR0:=IN:
>ASN DR0:=OU:
>ASN DR0:=LB:
>ASN DR0:=WK:
>ASN DR0:=TK:
>ASN DR0:=BC:
>ASN DR0:=LI:
>ASN DR0:=OB:
>ASN DR0:=EX:
>ASN DR0:=MP:
>;
>; You can:
>;
>;     • do a complete SYSGEN
>;
>;     • continue a previous SYSGEN from where you left off
>;
>;     • do an individual section of SYSGEN
>;
>;
>* SUL20   Do you want to do a complete SYSGEN? [Y/N D:Y]:  (RET)
>;
>INS [3,54]MAC/TASK=MACT36
>INS [3,54]PIP/TASK=PIPT36
>INS [3,54]LBR/TASK=LBRT36
>INS [3,54]TKB/TASK=TKBT36
>INS [3,54]VMR/TASK=VMRT36
>;
>;
>;
>;=====
>; Choosing Executive Options      16-MAY-85 at 17:07
>;=====
>;
>;
>; Using saved answer file DR0:[200,200]SYSGENSA1.CMD;1
>; created on 16-MAY-85 at 16:49:45.
>;
>; Example SYSGEN.
>;
>;
>;
>;=====
>; Choosing Peripheral Configuration      16-MAY-85 at 17:07
>;=====
>;
>;
>; Using saved answer file DR0:[200,200]SYSGENSA2.CMD;1
>; created on 16-MAY-85 at 16:51:51.
>;
>; Example SYSGEN.
>;
>;
>;
>; DR:   controllers: RH11, RH70      devices: RM02
>;                RH70                RM03, RM05, RM80, RP07
>;
>;
>; MM:   controllers: RH11, RH70      devices: TE16, TU16, TU45, TU77
>;                formatters: TM02, TM03
>;
>;

```

TWO SYSTEM GENERATION EXAMPLES

```

>;
>;           RH Configuration
>;
>;           Physical Unit Number
>;
>;           0         1         2         3         4         5         6         7
>;
>; RHA DR0:   DR1:   DR2:   DR3:
>; RHB DR0:   DR1:   DR2:   DR3:
>; RHC MM0:           MM2:
>;
>;
>;           MM Master / Slave Configuration
>;
>; Master           Slave Units
>;
>; MM0:             MM1:
>; MM2:             MM3:   thru   MM4:
>;
>;
>;
>; DL:   controllers: RL11, RLV12   devices: RL01, RL02
>;
>;           DL Configuration
>;
>;           Physical Unit Number
>;
>;           0         1         2         3         4         5         6         7
>;
>; DLA DL0:   DL1:
>;
>;
>;
>; DY:   controller: RX211, RXV21   device: RX02
>;
>;
>; LP:   controllers: LA180, LN01, LP11, LS11, LV11
>;        devices:   LA180, LN01, LP01, LP02, LP04, LP05, LP06,
>;                LP07, LP14, LP25, LP26, LP27, LS11, LV01
>;
>;
>; TT:   controllers: DL11, DLV11   controller mnemonic: YL
>;
>;
>; TT:   controllers: DHU11, DHV11   controller mnemonic: YV
>;
>; SGN -- Warning: JADRV.MAC is not in [11,10] on the target system
>;                disk. It must be put there before the Executive is assembled.
>;
>;
>; SGN -- Warning: JATAB.MAC is not in [11,10] on the target system
>;                disk. It must be put there before the Executive is assembled.
>;
>;
>;
>;=====
>; Assembling the Executive and Drivers           16-MAY-85 at 17:13
>;=====
>;

```



TWO SYSTEM GENERATION EXAMPLES

```

>;
>; Allocate space to be used later for the system image file.
>;
>SET /UIC=[1,54]
>PIP RSX11M.TMP/CO/BL:1026.=NL:
>;
>SET /UIC=[200,200]
>;
>SET /UIC=[1,24]
>SET /UIC=[200,200]
>SET /UIC=[1,54]
>PIP SYSVMR.CMD=[200,200]SYSVMR.CMD,VMRTTY.CMD
>;
>SET /UIC=[200,200]
>;
>SET /UIC=[1,24]
>PIP [1,24]/NV/NM=[200,200]RSXBLD.CMD,RSX11M,DSP11M,LDR11M
>PIP [1,24]/NV=[200,200]DIR11M.CMD,DR211M,DIRCOM,DR2COM,DIR
>PIP [1,24]/NV=[200,200]DR311M.CMD,DR411M,DR3COM,DR4COM
>PIP [1,24]/NV=[200,200]VEC11M.CMD,DCM11M,VECCOM,DCMCOM
>;
>TIME
18:50:49 16-MAY-85
>;
>TKB @RSXBLD
>;
>TIME
19:06:16 16-MAY-85
>;
>TKB @[200,200]DRIVERS.BLD
>;
>TIME
19:08:42 16-MAY-85
>SET /UIC=[200,200]
>;
>;
>;
>;=====
>; Building the Privileged Tasks      16-MAY-85 at 19:08
>;=====
>;
>;
>;
>ASN SY:=MP:
>;
>SET /UIC=[1,24]
>;
>TIME
19:08:46 16-MAY-85
>;
>TKB @ACCRESBLD
>TKB @ACNRESBLD
>TKB @ACSRESBLD
>TKB @BOOBLD
>TKB @BPRBLD
>TKB @BROBLD
>TKB @BYEBLD
>TKB @DMOBLD
>TKB @ELIRESBLD
>TKB @ERLBLD
>TKB @FCPLRGLD
>TKB @FXRBLD
>TKB @F11MSGBLD
>TKB @HELRESBLD

```

TWO SYSTEM GENERATION EXAMPLES

```
>TKB @HRCBLD
>TKB @INIBLD
>TKB @INSBLD
>TKB @LOABLD
>TKB @LPPRESBLD
>TKB @MCRBLD
>TKB @MCDBLD
>TKB @MOUBLD
>TKB @MTABLD
>TKB @PMDRESBLD
>TKB @PMTBLD
>TKB @PSWRESBLD
>TKB @QMGRESBLD
>TKB @RMDBLD
>TKB @SAVBLD
>TKB @SHFBLD
>TKB @SHUBLD
>TKB @SYLRESBLD
>TKB @TKNBLD
>TKB @UFDBLD
>TKB @UNLRESBLD
>;
>TIME
19:56:06 16-MAY-85
>;
>ASN LB:=OU:
>SET /UIC=[200,200]
>;
>;
>;
>;=====
>; Building the Nonprivileged Tasks      16-MAY-85 at 19:56
>;=====
>;
>;
>;
>; Using saved answer file DR0:[200,200]SYSGENSA3.CMD;1
>; created on 16-MAY-85 at 17:03:16.
>;
>; Example SYSGEN.
>;
>;
>;
>SET /UIC=[1,24]
>SET /UIC=[200,200]
>;
>ASN NL:=MP:
>;
>SET /UIC=[1,24]
>;
>TKB @ICMRESBLD
>TKB @TKBRESBLD
>;
>SET /UIC=[200,200]
>;
>;
>;=====
>; Creating the System Image File      16-MAY-85 at 20:00
>;=====
>;
>;
>SET /UIC=[1,54]
>;
```

TWO SYSTEM GENERATION EXAMPLES

```

>PIP RSX11M.TMP;*/DE/NM
>;
>PIP RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK
>;
>ASN LB:=SY:
>VMR @SYSVMR
VMR -- *DIAG*-Installed tasks or commons may no longer fit in partition
SET /TOP=SYSPAR:--*
VMR -- *DIAG*-Loadable driver larger than 4K
LOA TT:/SIZE=16300
VMR -- *DIAG*-Installed tasks or commons may no longer fit in partition
SET /TOP=DRVPAR:--*
SECPOL 117734 00120000 00100000 SEC POOL
SYSPAR 117670 00220000 00137600 MAIN
      117624 00220000 00070700 RO COM !DIR11M!
      117270 00310700 00003500 TASK [...LDR]
      116664 00314400 00030200 TASK [MCR...]
      116464 00344600 00007700 TASK [TKTN ]
      116264 00354500 00003100 TASK [SHF...]
DRVPAR 116204 00357600 00066600 MAIN
      116140 00357600 00036500 DRIVER (TT:)
      115140 00416300 00005400 DRIVER (DR:)
      114210 00423700 00005300 DRIVER (MM:)
      113620 00431200 00003100 DRIVER (DL:)
      113254 00434300 00004600 DRIVER (DY:)
      113014 00441100 00001200 DRIVER (LP:)
      112604 00442300 00000100 DRIVER (NL:)
      112540 00442400 00002400 DRIVER (VT:)
      112474 00445000 00001300 DRIVER (RD:)
      112304 00446300 00000100 DRIVER (JA:)
GEN    112240 00446400 01331400 MAIN
      112174 00446400 00002000 RO COM !DYCOM !
...LDR 12.00 117504 SYSPAR 248. 00003500 LB0:-00163041 FIXED
TKTN   06.10 116530 SYSPAR 248. 00007700 LB0:-00171123 FIXED
FllMSG 14.00 110264 GEN      200. 00006200 LB0:-00165042
MTAACP 15.00 107704 GEN      200. 00016200 LB0:-00167404
MCR... 06.00 117134 SYSPAR 160. 00030200 LB0:-00165617 FIXED
FllACP 06.00 111744 GEN      149. 00014200 LB0:-00164712
ERRLOG 04.00 111414 GEN      148. 00057500 LB0:-00164573
PMT... 2.00 110764 GEN      148. 00007000 LB0:-00167365
HRC... 03.00 110024 GEN      140. 00056300 LB0:-00165257
PMD... 07.00 107564 GEN      140. 00017400 LB0:-00167322
SYSLOG 03.00 110524 GEN      130. 00021600 LB0:-00171061
SHF... 6.00 116330 SYSPAR 105. 00003100 LB0:-00170773 FIXED
FXR... 02.00 110144 GEN      100. 00003200 LB0:-00165032
BAPO   04.00 111534 GEN       80. 00047200 LB0:-00164102
QMG... 03.01 110644 GEN       75. 00034400 LB0:-00167772
LPO    03.03 111200 GEN       70. 00015100 LB0:-00166274
ACNT   06.00 110404 GEN       50. 00051700 LB0:-00163557
SHUTUP 03.00 107444 GEN       50. 00015100 LB0:-00171004
...RMD 3.00 001236+ GEN      225. 00040600 LB0:-00170264
...DCL 21B 001212+ GEN      160. 00055400 LB0:-00042203
...DMO 04.00 001214+ GEN      160. 00017000 LB0:-00164466
...MCR 04.03 001230+ GEN      160. 00040300 LB0:-00166531
...MOU 26.00 001232+ GEN      160. 00043600 LB0:-00167131
...CA. 14.00 001262+ GEN      150. 00025200 LB0:-00053251
...INS 14.00 001226+ GEN      100. 00047500 LB0:-00165524
...SAV 09.00 001260+ GEN      100. 00056400 LB0:-00170152
...UFD 06.00 001264+ GEN      100. 00014000 LB0:-00171253
...ACS 3.00 001242+ GEN       70. 00005300 LB0:-00163645
...ACC 03.01 001204+ GEN       65. 00031700 LB0:-00163414
...AT. 7.0  001220+ GEN       64. 00055100 LB0:-00171545

```

TWO SYSTEM GENERATION EXAMPLES

```

...INI 23.00 001222+ GEN 60. 00035500 LB0:-00165400
...HOM 23.00 001224+ GEN 60. 00035500 LB0:-00165400
...BRO 06.00 001206+ GEN 50. 00036300 LB0:-00163736
...BYE 03.00 001210+ GEN 50. 00020100 LB0:-00164434
...HEL 3.01 001216+ GEN 50. 00033200 LB0:-00163337
...PIP 17.00 001234+ GEN 50. 00034200 LB0:-00051031
...UNL 5.0 001240+ GEN 50. 00036700 LB0:-00171303
...BOO 06.02 001244+ GEN 50. 00033200 LB0:-00163664
...CON 03.00 001246+ GEN 50. 00130000 LB0:-00041740
...ELI 03.00 001250+ GEN 50. 00032000 LB0:-00164522
...LOA 5.1 001252+ GEN 50. 00036200 LB0:-00166014
...MAG 03.00 001254+ GEN 50. 00036100 LB0:-00165071
...PSW 02.00 001256+ GEN 50. 00016200 LB0:-00167744

```

```

RHA OFL CPA CSR=176700 VEC=254 PRI=5
RHB OFL CPA CSR=176300 VEC=150 PRI=5
RHC OFL CPA CSR=172440 VEC=224 PRI=5
YLA OFL CPA CSR=177560 VEC=60 PRI=5
YVA OFL CPA CSR=160020 VEC=310 PRI=5
DLA OFL CPA CSR=174400 VEC=160 PRI=5
DYA OFL CPA CSR=177170 VEC=264 PRI=5
LPA OFL CPA CSR=177514 VEC=200 PRI=4

```

```

TT0: YLA0: OFL DRIVER
TT1: YVA0: OFL DRIVER
TT2: YVA1: OFL DRIVER
TT3: YVA2: OFL DRIVER
TT4: YVA3: OFL DRIVER
TT5: YVA4: OFL DRIVER
TT6: YVA5: OFL DRIVER
TT7: YVA6: OFL DRIVER
TT10: YVA7: OFL DRIVER
TT11: YVA10: OFL DRIVER
TT12: YVA11: OFL DRIVER
TT13: YVA12: OFL DRIVER
TT14: YVA13: OFL DRIVER
TT15: YVA14: OFL DRIVER
TT16: YVA15: OFL DRIVER
TT17: YVA16: OFL DRIVER
TT20: YVA17: OFL DRIVER
VT0: OFL DRIVER
RD0: ONL DRIVER
DR0: RHB0: RHA0: OFL DRIVER
DR1: RHB1: RHA1: OFL DRIVER
DR2: RHB2: RHA2: OFL DRIVER
DR3: RHB3: RHA3: OFL DRIVER
MM0: RHC0: OFL DRIVER
MM1: RHC0: OFL DRIVER
MM2: RHC2: OFL DRIVER
MM3: RHC2: OFL DRIVER
MM4: RHC2: OFL DRIVER
DL0: DLA0: OFL DRIVER
DL1: DLA1: OFL DRIVER
DY0: DYA0: OFL DRIVER
DY1: DYA1: OFL DRIVER
LPO: LPA0: OFL DRIVER
NLO: OFL DRIVER
JA0: OFL DRIVER

```

POOL=1200:1638.:01638.:1200

>SET /UIC=[200,200]

>;

>REM MACT36

>REM PIPT36

>REM LBRT36

>REM TKBT36

>REM VMRT36

## TWO SYSTEM GENERATION EXAMPLES

```
>;  
>; End of SYSGEN  
>;  
>TIME  
20:04:36 16-MAY-85  
>;  
>ASN =  
>;  
>@ <EOF>  
>
```



## APPENDIX E

### ADDRESS AND VECTOR ASSIGNMENTS

Specific algorithms exist for assigning UNIBUS addresses and interrupt vector addresses to all devices attached to PDP-11 hardware. UNIBUS addresses and interrupt vector address assignments are either floating or fixed. If a device has a floating address assignment, the presence or absence of any floating address device affects the assignment of addresses to other floating address devices. Similarly, certain devices have floating vector addresses.

Interrupt vectors must be assigned in a specific sequence, and the presence of one type of device affects the correct assignment of interrupt vectors to other devices. If a device has a fixed address or vector, its location is unaffected by other devices on the system.

This appendix presents the algorithms for assigning floating addresses and vectors. It also lists the fixed assignments for devices supported by the Autoconfigure task. DIGITAL recommends that you configure your hardware according to the configuration rules.

#### E.1 AUTOCONFIGURE DEVICE SUPPORT

The following table lists the devices supported by Autoconfigure. The complete list of devices supported by RSX-11M-PLUS can be found in the RSX-11M-PLUS Software Product Description.

Certain devices have floating CSR addresses. A complete description of the algorithm used to determine these CSR addresses can be found in Section E.2.

Table E-1 also identifies those devices that have floating vectors. These devices can be identified by a ranking priority under the vector label. The floating vectors begin at address 300 (octal) and proceed continuously upward.

Gaps in the vector assignments are not required. The vector assignment sequence is done based on ascending vector ranking. That is, the device with the lowest rank is assigned the next floating vector address. The autoconfiguration process dynamically computes the vectors of all supported devices. This is done by forcing each present device to interrupt.

## ADDRESS AND VECTOR ASSIGNMENTS

Table E-1  
Autoconfigure Device Support

Device	CSR Address	Reg. Size	First Vector	Maximum Number Ctrl	Interrupt Priority	Remarks
TA11	177500	4	260	1.	6	
TU58		10		4.	5	On an DL11
RK11	177404	20	220	1.	5	
RL11/RL211	174400	20	160	1.	5	
RK611/RK711	177440	40	210	1.	5	
RP11	176714	40	254	1.	5	
TC11	177342	20	214	1.	6	
KDA50/UDA50	172150	4	154	1.	5	MSCP devices
RQDX/RC25						
RX11/RX211	177170	10	264	1.	5	
RH11/RH70	172040	54	204	1.	5	RS03/RS04
RH11/RH70	172440	54	224	1.	5	TU16/45/77, TE16
RH11/RH70	175400	54	260	1.	5	RS/RP/RM/TU ALT.
RH11/RH70	176300	54	150	1.	5	TU78
RH11/RH70	176400	54	204	1.	5	ML11
RH11/RH70	176700	54	254	1.	5	RP04/05/06/07 or RM02/03/05/80
TM11	172522	20	224	1.	5	
TS11/TU80						
TK25/TSV05	172522	4	224	8.	5	
TK50	174500	4	260	2.	5	
LP/LS/LV11	177514	10	200	1.	4	LPA
LP/LS/LV11	164004	10	170	1.	4	LPB
LP/LS/LV11	164014	10	174	1.	4	LPC
LP/LS/LV11	164024	10	270	1.	4	LPD
LP/LS/LV11	164034	10	274	1.	4	LPE
LP/LS/LV11	164044	10	774	1.	4	LPF
LP/LS/LV11	164054	10	770	1.	4	LPG
LP/LS/LV11	164064	10	764	1.	4	LPH
PR11	177550	10	070	1.	4	
PC11	177554	10	074	1.	4	
DH11/DH11	FLOAT	20	Rank 16	16.	5	
DH11						
DL11-A/B/J	176500	10	Rank 2	16.	5	
DL11-C/D/E	175610	10	Rank 14	31.	5	
DL11-W	177560	10	060	1.	4	Console
DM11-BB	170500	10	Rank 6	16.	5	
DZ11/DQV11	FLOAT	10	Rank 28	16.	5	
DZV11						

### E.2 FLOATING ADDRESS ASSIGNMENT ALGORITHM

The autoconfiguration process finds only the devices listed in the previous table. If the system contains devices not listed, you must configure them manually.

The floating address space starts at 760010(octal) and proceeds upward to 764000(octal). A gap in the address space (no SLAVE SYNC) implies that a device does not exist.

The first address of a new type of device is always on a  $2^N$  word boundary, where N is the first integer greater than or equal to  $\text{LOG}_2 M$  and M is the number of device registers.

## ADDRESS AND VECTOR ASSIGNMENTS

Number of Registers in Device	Possible Boundaries
1	Any word
2	XXXXX0,XXXXX4
3,4	XXXXX0
5,6,7,8	XXXXX00,XXXXX20,XXXXX40,XXXXX60
9 thru 16	XXXXX00,XXXXX40

A gap of at least one word is left after each type of device. Note that the gap must be at least one word but may be longer than one word.

Address 760010 is reserved for the first DJ11. Since the DJ11 has four registers, additional DJ11s are assigned addresses modulo 10(octal) immediately following the first DJ11 (that is, 760010, 760020, and the like.) The modulo 10(octal) 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 is at 760020. All gaps must be at least one word.

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(octal) 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 begins 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 modulo 20 boundary following the last DH11.

After all DH11 addresses and the DH11 gap are defined, DQ11, DU11, DUP11, LK11, DMC11, DZ11, and KMC11 addresses and the required gaps can be assigned in sequence. Addresses for any future floating address devices will be assigned in a similar manner.

### E.3 FLOATING ADDRESS WORKSHEET

The algorithm for assigning floating addresses can be difficult to follow for a large configuration with multiple units of several types of floating address devices. The floating address worksheet (Figure E-1) is provided as an aid in determining your hardware configuration. The worksheet allows you to assign device addresses quickly, without requiring you to refer to the algorithm. Section E.3.2 contains instructions for using the worksheet, and a filled-out worksheet is provided as an example (Example E-1).

#### E.3.1 Worksheet Format

The worksheet is divided into four sections covering the address range 760010 through 762000. Although the floating address area continues up through address 764000, the worksheet should cover most configurations. If necessary, you can create a second worksheet by adding 2000 to all addresses listed.

## ADDRESS AND VECTOR ASSIGNMENTS

### E.3.2 Worksheet Instructions

The following are the instructions for the use of the worksheet:

1. Record the quantity of each type of floating address device in the spaces provided on page 1 of the worksheet.
2. Beginning at the upper left of the worksheet at address 760010 and proceeding down the DJ11 column, record the unit numbers for all DJ11s in the configuration. Begin with unit 0 and end with unit n-1. (There are n DJ11s in the configuration.)

Immediately below the last DJ11 unit, mark an "X" for the required DJ11 address gap. Also mark an "X" in the box immediately to the right (DH11 column).

When numbering device units down the appropriate column, use only the unshaded boxes. The shaded boxes represent illegal addresses for the particular device type. Because the gap address must also be a legal device address, use only an unshaded box for marking the gap with an "X" when numbering down a column.

In marking an "X" in the column to the right of a device address gap, use shaded boxes because the "X" in the next column merely provides a starting point for numbering units of the next device type. If there are no units of a particular device type, enter only the "X"'s to mark the gap on the worksheet.

If you use all available space in one section of the worksheet, simply copy the entries on the last line of the full section to the top line of the next section. Then continue numbering in the new section.

Continuing just below the "X" in the DH11 column, number all DH11 units. Once again, start with unit 0 and end with 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. Also mark an "X" in the box to the right (whether it is shaded or unshaded).

Continue with the remaining floating address devices. In each case, number units from 0 through 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 in the box immediately to the right of the last unit (whether that box is shaded or unshaded).

3. After you have recorded all floating address devices, read the UNIBUS address for each device unit directly from the worksheet and list each address in the spaces provided on page 2 of the worksheet.

# ADDRESS AND VECTOR ASSIGNMENTS

① Record quantity of each device:

DJ11 \_\_\_\_\_  
 DH11 \_\_\_\_\_  
 DQ11\* \_\_\_\_\_  
 DU11\* \_\_\_\_\_

DUP11 \_\_\_\_\_  
 LK11\* \_\_\_\_\_  
 DMC11 \_\_\_\_\_  
 DZ11 \_\_\_\_\_

KMC11\* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

② Enter unit numbers:

ADDRESS	DEVICE										
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		
760000											
760010											
760020											
760030											
760040											
760050											
760060											
760070											
760100											
760110											
760120											
760130											
760140											
760150											
760160											
760170											
760200											
760210											
760220											
760230											
760240											
760250											
760260											
760270											
760300											
760310											
760320											
760330											
760340											
760350											
760360											
760370											
760400											
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		

ADDRESS	DEVICE										
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		
760400											
760410											
760420											
760430											
760440											
760450											
760460											
760470											
760500											
760510											
760520											
760530											
760540											
760550											
760560											
760570											
760600											
760610											
760620											
760630											
760640											
760650											
760660											
760670											
760700											
760710											
760720											
760730											
760740											
760750											
760760											
760770											
761000											
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		

\* This device is not supported on RSX-11M-PLUS but this entry in the worksheet is required as a place holder.

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Figure E-1 Blank Floating Address Worksheet

# ADDRESS AND VECTOR ASSIGNMENTS

ADDRESS	DEVICE									
	D J 1 1	D H 1 1	D Q 1 1	D U 1 1	D U P 1	L K 1 1	D M C 1	D Z 1 1	K M C 1	1 1 *
761000										
761010										
761020										
761030										
761040										
761050										
761060										
761070										
761100										
761110										
761120										
761130										
761140										
761150										
761160										
761170										
761200										
761210										
761220										
761230										
761240										
761250										
761260										
761270										
761300										
761310										
761320										
761330										
761340										
761350										
761360										
761370										
761400										
	D J 1 1	D H 1 1	D Q 1 1	D U 1 1	D U P 1	L K 1 1	D M C 1	D Z 1 1	K M C 1	1 1 *

ADDRESS	DEVICE									
	D J 1 1	D H 1 1	D Q 1 1	D U 1 1	D U P 1	L K 1 1	D M C 1	D Z 1 1	K M C 1	1 1 *
761400										
761410										
761420										
761430										
761440										
761450										
761460										
761470										
761500										
761510										
761520										
761530										
761540										
761550										
761560										
761570										
761600										
761610										
761620										
761630										
761640										
761650										
761660										
761670										
761700										
761710										
761720										
761730										
761740										
761750										
761760										
761770										
762000										
	D J 1 1	D H 1 1	D Q 1 1	D U 1 1	D U P 1	L K 1 1	D M C 1	D Z 1 1	K M C 1	1 1 *

③ List UNIBUS addresses for each device, reading from the tables just completed:

DEVICE	UNIT	ADDRESS	DEVICE	UNIT	ADDRESS	DEVICE	UNIT	ADDRESS
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

\* This device is not supported on RSX-11M-PLUS but this entry in the worksheet is required as a place holder.

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Figure E-1 (Cont.) Blank Floating Address Worksheet

# ADDRESS AND VECTOR ASSIGNMENTS

① Record quantity of each device:

DJ11 0  
 DH11 3  
 DQ11\* 0  
 DU11\* 0

DUP11 1  
 LK11\* 0  
 DMC11 2  
 DZ11 3

KMC11\* 0

② Enter unit numbers:

ADDRESS	DEVICE										
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		
760000											
760010	X	X									
760020		0									
760030											
760040		1									
760050											
760060		2									
760070											
760100		X	X								
760110			X	X							
760120				X	X						
760130					0						
760140					X	X					
760150						X	X				
760160							0				
760170							1				
760200							X	X			
760210								0			
760220								1			
760230								2			
760240								X	X		
760250									X	X	
760260											
760270											
760300											
760310											
760320											
760330											
760340											
760350											
760360											
760370											
760400											
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		

ADDRESS	DEVICE										
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		
760400											
760410											
760420											
760430											
760440											
760450											
760460											
760470											
760500											
760510											
760520											
760530											
760540											
760550											
760560											
760570											
760600											
760610											
760620											
760630											
760640											
760650											
760660											
760670											
760700											
760710											
760720											
760730											
760740											
760750											
760760											
760770											
761000											
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		

\* This device is not supported on RSX-11M-PLUS but this entry in the worksheet is required as a place holder.

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Example E-1 Completed Floating Address Worksheet

# ADDRESS AND VECTOR ASSIGNMENTS

ADDRESS	DEVICE										
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		
761000											
761010		█									
761020											
761030		█									
761040											
761050		█									
761060											
761070		█									
761100											
761110		█									
761120											
761130		█									
761140											
761150		█									
761160											
761170		█									
761200											
761210		█									
761220											
761230		█									
761240											
761250		█									
761260											
761270		█									
761300											
761310		█									
761320											
761330		█									
761340											
761350		█									
761360											
761370		█									
761400											
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		

ADDRESS	DEVICE										
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		
761400											
761410		█									
761420											
761430		█									
761440											
761450		█									
761460											
761470		█									
761500											
761510		█									
761520											
761530		█									
761540											
761550		█									
761560											
761570		█									
761600											
761610		█									
761620											
761630		█									
761640											
761650		█									
761660											
761670		█									
761700											
761710		█									
761720											
761730		█									
761740											
761750		█									
761760											
761770		█									
762000											
	D J 1 1	D H 1 1	D Q 1 1 *	D U 1 1 *	D U P 1 1	L K 1 1 *	D M C 1 1	D Z 1 1	K M C 1 1 *		

③ List UNIBUS addresses for each device, reading from the tables just completed:

DEVICE	UNIT	ADDRESS	DEVICE	UNIT	ADDRESS	DEVICE	UNIT	ADDRESS
<u>DH</u>	<u>0</u>	<u>760020</u>	<u>DZ</u>	<u>0</u>	<u>760210</u>	_____	_____	_____
<u>DH</u>	<u>1</u>	<u>760040</u>	<u>DZ</u>	<u>1</u>	<u>760220</u>	_____	_____	_____
<u>DH</u>	<u>2</u>	<u>760060</u>	<u>DZ</u>	<u>2</u>	<u>760230</u>	_____	_____	_____
<u>DUP</u>	<u>0</u>	<u>760130</u>	_____	_____	_____	_____	_____	_____
<u>DMC</u>	<u>0</u>	<u>760160</u>	_____	_____	_____	_____	_____	_____
<u>DMC</u>	<u>1</u>	<u>760170</u>	_____	_____	_____	_____	_____	_____

\* This device is not supported on RSX-11M-PLUS but this entry in the worksheet is required as a place holder.

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Example E-1 (Cont.) Completed Floating Address Worksheet

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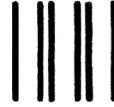
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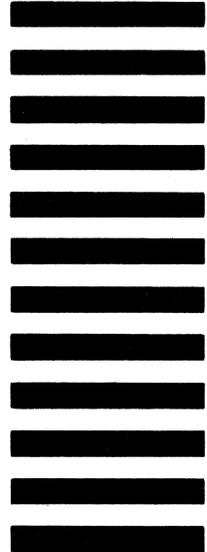
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