RSX–11M–PLUS
System Generation and Installation Guide

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RSX-11M-PLUS Version 2.1

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PREFACE

MANUAL OBJECTIVES AND INTENDED AUDIENCE

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 set of application requirements.

If you need to generate an RSX-11M-PLUS operating system, you should read this manual and use it as a guide for each step of the system generation process.

STRUCTURE OF THIS DOCUMENT

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.

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 or RC25 disks for use with smaller PDP-11 configurations.

Appendixes A through E supply worksheets used 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.

ASSOCIATED DOCUMENTS

Other manuals closely allied to the purposes of this document are described briefly in the RSX-11M-PLUS Information Directory and Master Index. The Information Directory defines the intended readership of each manual in the RSX-11M-PLUS set and provides a brief synopsis of each manual's contents.

You must read the RSX-11M-PLUS/RMS-11 Release Notes before you attempt to perform a system generation. Information that was not included in this and other manuals but which is vital to the performance of a successful system generation is contained in the Release Notes, as well as a complete summary of the new features and characteristics of this release of RSX-11M-PLUS.

The RSX-11M/M-PLUS System Management Guide contains information on many 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 DOCUMENT

Throughout this book, symbols and other notation conventions are used to represent keyboard characters, to convey textual information, and to otherwise aid the presentation of material. The symbols and conventions used are explained below.

Convention	Meaning
RET	A 2- to 6-character symbol indicating that you must press a key on the terminal; for example, RET indicates the RETURN key and LF indicates the LINE FEED key.
CTRL/x	The symbol CTRL/x indicates that you must press the key labeled CTRL while you simultaneously press another key; for example, CTRL/Z indicates the CTRL and Z keys. In examples, this control key sequence is shown as ^x; for example, ^O indicates the result of CTRL/O because that is how the system echoes most control key combinations.
^	The circumflex character, appearing with another character, represents the system response to receiving a control character. For example, when you type CTRL/Z while running some system tasks, the system echoes ^Z. (On some terminals, the up-arrow (^) character is used in place of the circumflex.)

UPPERCASE and lowercase	In command format descriptions, uppercase characters are 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 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: /CSR=176300
"print" and "type"	As these words are used in the text, the system prints and the user types.
MCR>	This is the explicit prompt of the Monitor Console Routine (MCR), one of the command interfaces used on RSX-11M-PLUS systems.
>	A right-angle bracket is the system command interface prompting character. Whenever control is returned to the user task terminal and the system is ready to accept input, the prompt appears.
red ink	Color-highlighted information in examples indicates information that you type. Information in examples not in the contrasting color represents computer output.
{}	Braces enclose lists of command or message elements from which one item is selected or displayed.

SUMMARY OF TECHNICAL CHANGES

This revision of the RSX-11M-PLUS System Generation and Installation Guide reflects the following software technical changes and additions:

- Support has been added for the following devices:

  DHV11
  LA50
  LN01
  LP07
  LP27
  RA60
  RA81
  RC25
  RX50
  RD51
  TU80
  TSV05

- The MICRO/PDP-11 has been added as a supported processor.

- Support has been added for SPM-11M-PLUS, the Software Performance Monitor.

- RMS-11 V2.0 is included on the RSX-11M-PLUS distribution kit. There is no longer a separate RMS-11 distribution disk or tape, nor is there separate installation documentation.

- Pregenerated RSX-11M-PLUS systems are now available in both RL02 and RC25 disk kits. The following is a list of some of the changes that have been made to the RL02 pregenerated kit since the last release of RSX-11M-PLUS:

  - Each pregenerated disk kit contains two pregenerated Executives, one that includes I- and D-space support and one that does not. Included on each disk is an indirect command file you can use to increase available space on your system disk by deleting the Executive that you do not need.

  - The pregenerated kits feature a special, easily-edited startup command file.

  - Support for the RA60, RA80, RA81, RC25, RD51, RX50, TU80, and TSV05 has been added to the pregenerated kits.

  - Certain tasks have been removed from the pregenerated system kits to increase available pool space.

  See Chapter 5, Pregenerated RSX-11M-PLUS Kits, for information on these and other changes.

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 and performance requirements. This chapter provides an outline of the stages involved in performing a system generation.

1.1 WHICH CHAPTERS OF THIS MANUAL SHOULD YOU READ?

An RSX-11M-PLUS operating system is tailored for a particular type of PDP-11 processor and configuration of peripherals through a process called system generation. This process is controlled and performed by a program called SYSGEN.

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

The first is the **distribution kit,** which 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. If you have this kit, you should read this and every other chapter in this book except Chapter 5.

The second is the **pregenerated system kit.** This is a disk pack 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. If you have this kit, you should turn directly to Chapter 5. You do not need to concern yourself with the material in this and subsequent chapters. Chapter 5 explains how to start using your pregenerated system.

1.2 SYSTEM GENERATION AND 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 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 in the course of system generation.

1.3 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 may need to install layered software products (higher-level languages such as FORTRAN, or communications products such as DECnet).

1.3.1 Preparation

This manual assumes that you have a running 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. Depending on the type of distribution kit you have, your system must have certain other peripheral devices.

From this point on, it is assumed that you have a hardware system suited for running an RSX-11M-PLUS system. For complete information on the hardware configuration required for running RSX-11M-PLUS, see the RSX-11M-PLUS Software Product Description.

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 more detail what you need before you start.

1.3.2 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 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 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.

1.3.3 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 is supplied with every RSX-11M-PLUS distribution kit and is issued on a periodic basis to customers who have purchased Update service. Instructions for applying Update are provided with the Update kit medium.

1.3.4 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, while Chapter 3 presents the details of each SYSGEN section.

1.3.5 Bootstrapping the Generated System

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

1.3.6 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.

1.3.7 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.

1.4 WHAT IS SYSGEN?

SYSGEN is the Indirect command procedure used to tailor and build an RSX-11M-PLUS operating system for a particular PDP-11 installation. 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 Release Notes for this release of RSX-11M-PLUS 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 intended to help you understand the consequences of choosing or omitting the various system options. Attempts to run SYSGEN without first consulting the documentation may yield undesired results.

1.5 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.

1.5.1 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.

1.5.2 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 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 section. For more information on using Autoconfigure, see Chapter 3.

1.5.3 Saved Answer Files

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

1.6 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 sequence, with the SYSGEN procedure automatically beginning the next section when it finishes the current section.

During a complete SYSGEN, the following sections are performed:

1. Choosing SYSGEN Options
2. Choosing Executive Options
3. Choosing Peripheral Configuration
4. Assembling the Executive and Drivers
5. Building the Executive and Drivers
6. Building the Privileged Tasks
7. Building the Nonprivileged Tasks
8. Creating the System Image File

An additional section, Adding a Device, is not normally performed as part of the SYSGEN process. For more information on this section, see Chapter 3 of this manual and Chapter 5 of the RSX-11M-PLUS Guide to Writing an I/O Driver.

In certain circumstances you may 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 may 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.

1.6.1 Choosing SYSGEN Options

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.

1.6.2 Choosing Executive Options

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

Your first choice, the Full-functionality Executive, contains all of 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 of 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 section, SYSGEN also asks you about the amount of memory on the system that you are generating and about the processor hardware options on the system.

1.6.3 Choosing Peripheral Configuration

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.

1.6.4 Assembling the Executive and Drivers

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

1.6.5 Building the Executive and Drivers

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 may be residing in UFD [1,54]. If you choose to save the old system generation files, SYSGEN transfers them to a UFD that you specify.

1.6.6 Building the Privileged Tasks

In this section, SYSGEN task-builds the privileged tasks, such as MCR, LOA, MOU, and UFD. Whenever you rebuild the Executive, it is necessary to rebuild the privileged tasks.

1.6.7 Building the Nonprivileged Tasks

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 those nonprivileged tasks that need to be rebuilt.

1.6.8 Creating the System Image File

In this section, the system image file is created by a VMR indirect command file named SYSVMR.CMD. SYSVMR automatically establishes the partition boundaries for the system image, loads all of the drivers, and installs the privileged tasks built during the Building the Privileged Tasks 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.

1.6.9 Adding a Device

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 system generation. It is performed if you want to add a new device or change the configuration of a device in an existing system. This section can also be used to add a user-supplied driver.

See Section 4.8.2 for more information on the Adding a Device 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.

1.7 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, consult the RSX-11M-PLUS Information Directory and Master Index.

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.

pool

Pool (also known as the dynamic storage region, or DSR) is an area in memory that is used as a work space 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 where they are located and how they are used.

Primary pool is an area of memory within the Executive's address space. It is used for short-lived or frequently accessed data structures. Primary pool is a critical resource because it is used for many Executive and I/O operations and the amount 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 of 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.

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.

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 of 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 that you 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.

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.

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 instead of 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-11/70 and PDP-11/44 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 you can tell which tasks are built to use FCSFSL. The FCSFSL versions of the tasks have exactly the same functionality 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 instead of 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 may 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 you can tell which tasks are built to use FCSRES. The FCSRES versions of the tasks have exactly the same functionality 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.

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 talks to FCS, FCS talks to the ACP, and the ACP talks to 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.

Full-functionality Executive

The Full-functionality Executive, which is one of the options you can select in the Choosing Executive Options section of SYSGEN, contains all of the RSX-11M-PLUS service features. Selecting this Executive ensures that there are no missing features for external tasks (for example, layered products). In addition, if you select this Executive, the SYSGEN procedure is shorter.

User-tailored Executive

The User-tailored Executive, which is one of the options you can select from the Choosing Executive Options 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.

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.

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.

stand-alone system

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

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 necessary for you to generate an RSX-11M-PLUS system.

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 may take place on the target system computer or on a different computer (see "host system").

host system

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

virgin system

A virgin system is a system image after SYSGEN has executed the SYSVMR.CMD indirect command file and before the system has been bootstrapped and saved.

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 SAV command.

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 into memory the hardware bootblock record from an input device. The bootblock record contains a pointer to the code necessary to load the system image into memory.

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 BOO command. (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.

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 reducing greatly the number of questions asked in the course of running 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 may use previously generated saved answer files to generate a system without having to answer all the SYSGEN questions again.

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 saved answer files are created, 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 to actually generate a new system. The saved answer files generated can then be used to perform an unattended SYSGEN.

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.

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.

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.

dual-access device

A dual-access (or dual-ported) device is an I/O device that can be accessed by either of two controllers. This requires 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 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.

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 the RP04s, RP05s, and RP06s (device type DB) connected to it, the second controller (RHB) might have all the 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.

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.

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 where a new PS and PC are 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.

interrupt

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

CHAPTER 2

GETTING STARTED

This chapter describes the steps you must take to prepare for invoking the SYSGEN procedure.

2.1 WHAT YOU NEED BEFORE YOU BEGIN

Before you begin to follow the system generation procedure described in this manual, you should gather the necessary media, software, and hardware information that you will need in the course of 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** - In the course of generating a system, you require 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, since some of your devices may have nonstandard CSR and vectors 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 an RSX-11M-PLUS V2.1 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.

- **Completed Worksheets** - Appendix A contains a number of worksheets that are useful in organizing and collecting 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 as you invoke SYSGEN.

- **RSX-11M-PLUS/RMS-11 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.

2.1.1 Supported Target System Disks

Before you can invoke SYSGEN, you must copy the distribution kit software to the disk upon 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:

RK07	RM80	RP04
RM02	RA60	RP05
RM03	RA80	RP06
RM05	RA81	RP07

2.1.2 Blank Media Requirements

Use the following guidelines in determining what 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 RK07 as the target system disk, you need two blank RK07 disks, because the entire magnetic tape distribution kit does not fit on one RK07 disk.

  If you have the RK07 disk kit, you need two blank RK07 disks to copy both of the distribution kit disks.

- **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 hardware configuration. You need one 2400-ft magnetic tape (two 2400-ft tapes if you save the system on tape at a density of 800 bpi instead of 1600 bpi) 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 RC25 or 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. There are five types of distribution kits for RSX-11M-PLUS:

- Magnetic tape - 800 bpi
- Magnetic tape - 1600 bpi
- RK07 disk
- RC25 disk
- RL02 disk

The RC25 and RL02 disk kits are unlike the other kits. They each contain 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 these kits. See Chapter 5 for a complete description of the contents and use of the RC25 and RL02 pregenerated system kits.

Procedures for handling the magnetic tape 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
- 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.

Update has its own installation instructions and documentation.

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

In magnetic tape kits, these 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 disk packs in the RSX-11M-PLUS distribution kits.

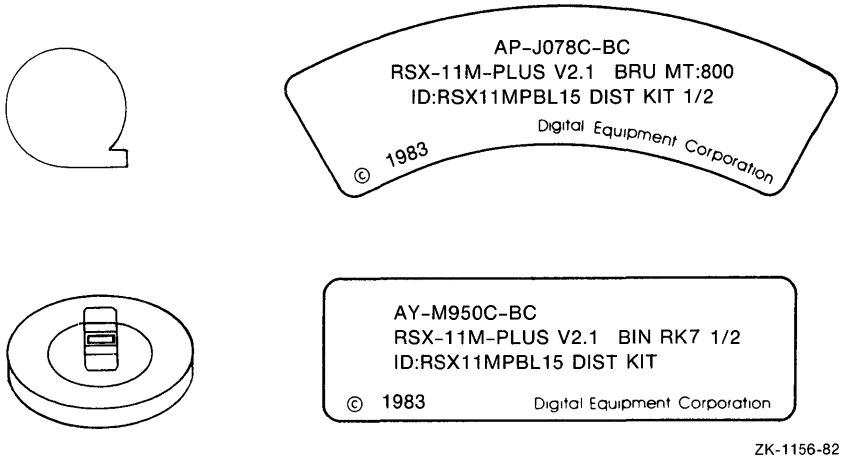

Figure 2-1 Examples of Paper Labels for Magnetic Tapes and Disk Packs

Each paper label contains many of 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")
- 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:MPLUSBL15SRC)
- Descriptive text (such as DIST KIT or BRUSYS STANDALONE COPY SYSTEM)
- Tape reel or disk pack 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.

The following sections describe each type of distribution kit.

2.2.1 Magnetic Tape - 1600 bpi

The kit consists of three magnetic tapes:

- Distribution kit (ID:RSX11MPBL15 DIST KIT)
- Update kit
- BRUSYS stand-alone system

2.2.2 Magnetic Tape - 800 bpi

The kit consists of four magnetic tapes:

- Distribution kit tape 1 (ID:RSX11MPBL15 DIST KIT 1/2)
- Distribution kit tape 2 (ID:RSX11MPBL15 DIST KIT 2/2)
- Update kit
- BRUSYS stand-alone system

The first distribution kit tape contains all of 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 RK07 Disk

The kit consists of three RK07 disks:

- Distribution kit disk 1 (ID:RSX11MPBL15 DIST KIT)
- Distribution kit disk 2 (ID:MPLUSBL15SRC DIST KIT)
- Update kit

The first distribution kit disk contains all the software components necessary to perform a complete system generation. The second distribution kit disk contains miscellaneous source 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 V2.0 or V2.1 system 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 you do not have access to a computer running an RSX-11M-PLUS V2.0 or V2.1 system, 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 the host computer is already running an RSX-11M-PLUS system (either V2.0 or V2.1), you can use the running system to copy the distribution kit and 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.

Since 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.

If you have an **RC25 or RL02 pregenerated system kit,** turn directly to the special instructions 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.

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
MM	0	172440	224
MS		172522	330
MT		172522	320

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-, MS-, and MT-type devices are nonstandard. The CSR address that BRUSYS expects for DR-type devices is 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
MS:/VEC=224
MT:/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 either the 800-bpi or 1600-bpi magnetic tape 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. Load the BRUSYS tape and the output disk on the appropriate drives. If you are not familiar with the procedure for loading tapes or disks on your 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, then begins to run the Stand-Alone Configuration and Disk Sizing Program (CNF).

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           177510    154     Present
MF FOR=0     175400    260     Not Present
MM FOR=0     172440    224     Present
MS           172522    330     Not Present
MT           172522    320     Not Present
```

   In the example, CNF does not find devices at the default CSR addresses for DP-, MF-, MS-, and MT-type devices. If any of those devices were to be used in copying the distribution kit, the actual CSR and/or vector address for that device would have to be entered using the /CSR or /VEC switches.

   If both of the 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-, MS-, and MT-type devices are nonstandard. The CSR address that BRUSYS expects for DR-type devices is also nonstandard. If you are using one or both 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
   ```

   For example, assume that you have a TU16 magnetic tape at nonstandard CSR and vector addresses of 176300(octal) and 150(octal), respectively, and an RP04 with the default addresses. Assuming that 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: DB0: (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'

   >TIM 20:06 03/02/82 (RET)
   >TIM (RET)
   20:06:01 3-MAR-82
   >
   ```

7. Format the output disk, if necessary. Disks purchased from DIGITAL are supplied 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 DB0:, use the following command sequence:

   ```
   >RUN FMT (RET)
   >
   FMT> DB0:/VERIFY (RET)

   ** WARNING  - Data will be lost on DB0: **

   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 DB0:, use the following command sequence:

```
>RUN BAD (RET)
>
BAD> DB0:/LIST (RET)
BAD -- DB0: 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.)

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

    For example, if you have a 1600-bpi distribution kit tape mounted on MM0:, and an RP06 output disk mounted on a drive designated as DB0:, use the following command sequence:

```
>RUN BRU (RET)
>
BRU>/DENSITY:1600/VERIFY/MAX:20956/HEADERS:10478 (RET)
From:    MM0: (RET)
To:      DB0: (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)
```

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

    You should alter the values specified in the /MAX and /HEADERS switches to suit the type of disk volume to which you are copying the distribution kit tape. Use the appropriate values from Table 2-1 for the arguments of the /MAX and /HEADERS switches.

Table 2-1
Disk Initialization Qualifier Values

Device	Value for /MAX Switch	Value for /HEADERS Switch
RA60	24617	12308
RA80	14629	7314
RA81	54815	51699
RK07	10567	1654
RM02/RM03	10567	4049
RM05	30781	25593
RM80	14923	7461
RP04/RP05	10567	5283
RP06	20956	10478
RP07	62007	51699

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, it is likely that your distribution kit tape is 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 start-up 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 start-up 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 Chapter 3 for the next step 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. Load the first distribution kit disk and a blank RK07 disk on your RK07 drives. If you are not familiar with the procedure for loading RK07 disks, 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 start-up command file, BASTART.CMD, which prompts you for the date and time. Type 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. Physically write-protect the distribution kit disk, then software bootstrap the BRUSYS system, using the following command line:

   >BOO [6,54]BRUSYS (RET)

This brings the BRUSYS system into memory. The RSX-11S stand-alone system prints an identification line on the console terminal, 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          177510    154     Present
MF FOR=0    175400    260     Not Present
MM FOR=0    172440    224     Present
MS          172522    330     Not Present
MT          172522    320     Not Present
```

If the RK07 disk drives that 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 that 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 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 177400(octal) and 240(octal), respectively, and you are using drives DK0: and DK1: the following is the sequence of commands to CNF:

```
Enter first device: DK0:/CSR=177400/VEC=240 (RET)

Enter second device: DK1:/CSR=177400/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.

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'

>TIM 07:47 05/20/82 (RET)
>TIM (RET)
07:47:01 20-MAY-82
>
```

8. Format the output disk, if necessary. Disks purchased from DIGITAL are supplied 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 DM0: and the output disk is mounted on DM1:, use the following command sequence:

```
>RUN BRU (RET)
>
BRU>/VERIFY (RET)
From:    DM0: (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, it is likely that your distribution kit disk is 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.

    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 start-up command file, BASTART.CMD, which asks a number of questions pertaining to your system. Answer these inquiries appropriately. When BASTART.CMD exits, proceed to Chapter 3 for the next step in the system generation procedure.

2.4.2 Copying Kits On Line

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

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 either the 800-bpi or 1600-bpi magnetic tape 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. Load the distribution kit tape and the output disk on 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 loading tapes or disks on your drives, consult the hardware documentation for the drives.

3. Allocate and mount the distribution kit tape and the target system disk. Use 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 supplied 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. 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:10567/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).

You should alter the values specified in the /MAX and /HEADERS switches to suit the type of disk volume to which you are copying the distribution kit tape. Use the appropriate values from Table 2-2 for the arguments of the /MAX and /HEADERS switches.

Table 2-2
Disk Initialization Qualifier Values

Device	Value for /MAX Switch	Value for /HEADERS Switch
RA60	24617	12308
RA80	14629	7314
RA81	54815	51699
RK07	10567	1654
RM02/RM03	10567	4049
RM05	30781	25593
RM80	14923	7461
RP04/RP05	10567	5283
RP06	20956	10478
RP07	62007	51699

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, it is likely that your distribution kit tape is 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 start-up command file that you invoke in Step 8.

7. Dismount the target system disk and mount it again, this time using the volume label (RSX11MPBL15) 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:RSX11MPBL15 (RET)
>ASN DR2:=SY: (RET)
```

8. Change your default UFD to [2,54], then invoke the baseline start-up 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 Chapter 3 for the next step 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

The 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, and 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. Load the first distribution kit disk and a blank RK07 disk on your RK07 drives, then write-protect the distribution kit disk. If you are not familiar with the procedure for loading RK07 disks, consult the hardware documentation for the drives.

3. 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 DM0: and your output disk is DM1:, use the following command sequence:

```
>ALL DM0: (RET)
>ALL DM1: (RET)
>MOU DM0:/FOR (RET)
>MOU DM1:/FOR (RET)
```

4. Format the output disk, if necessary. Disks purchased from DIGITAL are supplied 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)
```

5. 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)
```

6. 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 DM0: and the output disk is mounted on DM1:, use the following command sequence:

```
>RUN $BRU (RET)
BRU>/VERIFY/INITIALIZE (RET)
From:    DM0: (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, it is likely that your distribution kit disk is 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.

7. 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:/LOCK=UNLOAD (RET)
DMO -- TT36:   dismounted from DM0:    *** Final dismount initiated ***
>DMO DM1:/LOCK=UNLOAD (RET)
DMO -- TT36:   dismounted 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.

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.

8. Dismount the target system disk, and mount it again, this time using the volume label (RSX11MPBL15) 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:   dismounted from DM0:     *** Final dismount initiated ***
>MOU DM0:RSX11MPBL15 (RET)
>ASN DM0:=SY: (RET)
```

9. Change your default UFD to [2,54], then invoke the baseline start-up 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 Chapter 3 for the next step in the system generation procedure.

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.

The general format for SYSGEN questions is an asterisk followed by the question number, the text of the question, and a prompt (contained inside 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 two-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 what type of response 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

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:"11/70"]:
```

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 10(decimal). The third key letter (D) indicates that the default response is "11/70". Pressing the RETURN key without entering any characters enters the default response.

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

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

The prompt [Y/N] at the end of the above 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 at the end of the above 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

You should, of course, become familiar with this manual and the SYSGEN procedure before sitting down to begin generating your system. To the extent possible, this manual presents step-by-step procedures to

follow in preparing for and performing the SYSGEN procedure. You should keep it with you as you generate your system.

All of 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 answering 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 prints the help paragraphs and asks the question again.

Other manuals in the RSX-11M-PLUS documentation set contain information relative 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 at any time you wish to exit from the SYSGEN procedure, press CTRL/Z.

Note that exiting from SYSGEN in this way 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 in this chapter.

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 UFD back to [200,200] using the MCR SET command, as follows:

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

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

3. Invoke SYSGEN:

   ```
   >@SYSGEN RET
   ```

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.

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. The exceptions are the following:

- The console driver and 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 virgin 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.

The answers that you give to the following questions in the Choosing Peripheral Configuration section can be changed 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 virgin system image, and for RK05F disks.

  If you will be bootstrapping the virgin 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.
- 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 that you answer all the questions again.

SYSGEN creates three saved answer files:

SYSGENSA1.CMD	Contains the responses to questions in the Choosing Executive Options, Assembling the Executive and Drivers, Building the Executive and Drivers, Building the Privileged Tasks, and Creating the System Image File sections
SYSGENSA2.CMD	Contains the responses to questions in the Choosing Peripheral Configuration section
SYSGENSA3.CMD	Contains the responses to questions in the Building the Nonprivileged Tasks 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	An internal SYSGEN symbol
value	Your response

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

Every time you perform SYSGEN, it creates saved answer files with the names given above. 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 typing CTRL/Z, the saved answer file is closed at the point in the questions 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, 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 that 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 in this chapter.

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 normally and respond 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 make the proper choices for your installation. PREPGEN allows you to change your choices in, for example, the Choosing Peripheral Configuration section without having to reanswer the questions in the Choosing Executive Options 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 section. It is not always convenient to obtain the correct CSR and vector addresses for your specific peripheral devices. Although SYSGEN provides default CSR and vector addresses for most devices, there is no guarantee that your devices correspond to those addresses.

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.

To run Autoconfigure, answer 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 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 report Autoconfigure results (as described 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 and invoke SYSGEN again without choosing the Autoconfigure option. When SYSGEN fails to report Autoconfigure results, a severe hardware malfunction may have occurred, or you have not followed the standard DIGITAL configuration algorithm detailed in Appendix E.

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 may be output by Autoconfigure with the configuration information.

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?
```

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 input 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.

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

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
```

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 slave drive. Magnetic tape unit numbers are displayed in the following format: 0_1 where 0 is the formatter unit number 1 is the slave 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" above.
Sector interleaved	The RS03 or RS04 displayed supports sector interleaving, which allows the unit to optimize data accesses.

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 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 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.

Table 3-2
Hardware Supported by Autoconfigure

Processors	
MICRO/PDP-11[2]	22-Bit Addressing
PDP-11/23-PLUS	
PDP-11/24	
PDP-11/44	
PDP-11/70	

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	TA11 cassette[1]
DB	RP04/05/06 disk drive
DD	TU58 DECtape II
DK	RK11/RK05[1]
DL	RL211/RL01/RL02 disk[1]
DM	RK611/RK711 RK06/RK07 disk[1]
DP	RP11/RP02/RP03 disk[1]

1. Autoconfigure detects only the first controller for these devices.
2. Autoconfigure reports a processor type of "11/23-PLUS" for this processor.

(continued on next page)

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

I/O Peripherals and Controllers (Cont.)	
DR	RM02/RM03/RM05/RM80/RP07 disk drive
DS	RS03/RS04 fixed-head disk
DT	TC11/TU56 DECtape[1]
DU	UDA50/RC25/RA60/RA80/RA81 disk drive RQDX1/RX50/RD51 disk drive[1]
DX	RX11/RX01 floppy disk[1]
DY	RX211/RX02 floppy disk[1]
EM	ML11 semiconductor disk emulator
LP	LP/LS/LV11 line printer
MM	TU16/45/77/TE16 magnetic tape drive
MS	TS11/TU80/TSV05 magnetic tape drive
MT	TM11/TU10/TE10/TS03[1]
PR	PR11/PC11 paper tape reader[1]
PP	PC11 paper tape punch[1]
RH	RH11/RH70 MASSBUS controller
YH	DH11/DHV11 asynchronous terminal interface
YL	DL11/DLV11-A/B asynchronous interface
YL	DL11/DLV11-C/D/E asynchronous interface
YL	DL11/DLV11-J asynchronous interface
YL	DL11-W console interface with line clock
YM	DM11-BB modem controller for DH11
YZ	DZ11/DZV11 asynchronous terminal interface

1. Autoconfigure detects only the first controller for these devices.

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 necessary for you 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 will be used to invoke and perform the SYSGEN procedure. If the baseline 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.

The peripheral devices generated into the baseline system are shown in Tables 3-3 and 3-4.

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	3	172150	154
MS	1	172522	400
DX	2	177170	264
DY	2	160000	410
DD	2	160000	420
LP	1	177514	200
MT	2	160000	430

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/DHV11	16	160000	450
YZA	DZ11/DZV11	8	160000	460

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.

Instructions for applying Update are provided with the Update medium.

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

3.1.8 Generating a V2.1 System on an RSX-11M-PLUS V2.0 System

You can copy the distribution kit and perform an on-line SYSGEN using an RSX-11M-PLUS V2.0 system as the host system. Follow the instructions given in Chapter 2 for copying the distribution kit on line.

After you have made a copy of your distribution kit, do the following:

- 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:RSX11MPBL15 (RET)
>ASN DB0:=SY: (RET)
```

- Set your default UFD to [200,200] and invoke the BL10GEN.CMD command file located in UFD [200,200]. This command file installs the tasks needed to perform SYSGEN. These tasks are installed for use by your terminal only, so you must invoke BL10GEN.CMD from the same terminal from which you intend to invoke SYSGEN. For example:

```
>SET /UIC=[200,200] (RET)
>@BL10GEN (RET)
```

- Invoke the SYSGEN command file in UFD [200,200]. For example:

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

- Proceed to Section 3.2 for descriptions of the questions SYSGEN asks.

3.1.9 Invoking SYSGEN

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

- 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:RSX11MPBL15 (RET)
>ASN DB0:=SY: (RET)
```

- Set your default UFD 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.

3.2 SYSGEN QUESTIONS

The rest of this chapter describes the questions asked by the SYSGEN procedure. SYSGEN uses your responses to the questions asked in the various sections 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 of the questions described in this chapter, since many involve choices that are mutually exclusive. Therefore, while 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
- 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

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.

You answers to the questions in this section are not saved in a saved answer file. The questions are asked every time you invoke SYSGEN.

The following is a description of all the possible questions 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 V2.1 SYSGEN for the first time.

If you answer 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 by 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 in the course of the previous SYSGEN as input to this SYSGEN. The SYSGEN procedure uses the saved answers as your responses to the questions in this 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.

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

If you answer Yes to this question, SYSGEN asks you to provide the file name for the saved answer file that contains answers to the questions in the Choosing Executive Options, Assembling the Executive and Drivers, Building the Executive and Drivers, Building the Privileged Tasks, and Creating the System Image File sections.

SYSGEN OPTIONS (Cont.)

If you answer No, SYSGEN proceeds to Question SU040.

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

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

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

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

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

If you answer No, SYSGEN proceeds to Question SU060.

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

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

This question is asked only if you indicated that you wished to use saved answers to the Choosing Peripheral Configuration section.

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

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

If you answer No, SYSGEN proceeds to Question SU080.

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

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

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

*** 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.

SYSGEN OPTIONS (Cont.)

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]:**

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, answer No to this question.

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

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, it is not necessary 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 answer Yes to this question, the configuration data obtained by Autoconfigure appears in the default fields of each question. You can thereby choose to use some of the Autoconfigure results (by pressing the RETURN key and taking the default) or override the Autoconfigure results by entering a different response.

If you answer No to this question, SYSGEN uses all of the information Autoconfigure obtained to answer the questions in the Choosing Peripheral Configuration 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 of all of 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 answer Yes to this question. If you have just applied the latest Update and are now performing the required SYSGEN, you should answer Yes to this question.

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

If you answer No to this question, 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 answer Yes to this question, SYSGEN proceeds to Question SU140.

If you answer No to this question, SYSGEN proceeds to Question SU150.

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

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

This question is asked only if you answered Yes to Question SU130.

*** 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 want to do this if you wished 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 answer Yes to this question, SYSGEN proceeds to Question SU160.

If you answer No to this question, SYSGEN exits.

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

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

This question is asked only if you answered Yes to Question SU150.

EXECUTIVE OPTIONS

3.2.2 Choosing Executive Options

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 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:

```
MICRO/PDP-11
11/23-PLUS (also called 11/23-B)
11/24
11/44
11/70
```

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 or a PDP-11/70 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 of the following RSX-11M-PLUS operating system options:

- Support for Executive data space and user data space (This option is included in the Full-functionality Executive only if your processor contains I- and D-space hardware, such as the PDP-11/70 and PDP-11/44.)
- Support for supervisor-mode libraries (tasks linked to FCSFSL; PDP-11/70 and PDP-11/44 only)

EXECUTIVE OPTIONS (Cont.)

- Tasks linked to FCSRES (MICRO/PDP-11, PDP-11/23-PLUS and PDP-11/24 only)
- Task headers out-of-pool support
- All DIGITAL-supplied drivers loadable
- Interrupt Control Block (ICB) pool size of 128 words
- Shadow recording support
- Console driver support
- Resource Accounting support
- Batch processor support
- Queue Manager for spooling
- DIGITAL Command Language (DCL) and alternate CLI 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)
- 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 answer Yes to this question, SYSGEN proceeds to Question CE120.

If your answer No to this question, SYSGEN proceeds to Question CE030.

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

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

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

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

EXECUTIVE OPTIONS (Cont.)

Enter No if you do not wish to include Executive data space support. The MICRO/PDP-11, PDP-11/23-PLUS and PDP-11/24 processors do not contain I- and D-space hardware; systems generated with software support for Executive data space will not run on these processors. You should answer No to this question if you need to generate a system that runs on the MICRO/PDP-11, PDP-11/23-PLUS and/or PDP-11/24 processors as well as on the PDP-11/70 and/or PDP-11/44 processors.

This option significantly increases the available amount of system pool.

If you select this option, 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.

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

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

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

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

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

This option allows task headers to reside in physical memory outside of the dynamic storage region (pool). This increases the amount of pool available for other system functions.

This option is required for RTEM-11, the RT-11 emulator which runs under RSX-11M-PLUS. Note that RTEM-11 must be purchased and installed separately. Answer Yes to this question if you intend to install RTEM-11 on your system.

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

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

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 Task Builder Manual supplies details on using supervisor-mode libraries.

EXECUTIVE OPTIONS (Cont.)

If you answer Yes to this question, 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.

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-11/70 or PDP-11/44.

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

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, since the many, separate copies of FCS routines that would occur in task images are replaced by a single, shared copy used by all tasks.

If you respond Yes to this question, 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. 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.

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

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

This question permits you to specify that all DIGITAL-supplied drivers and their data bases are to be loadable.

This question appears only if you selected the User-tailored Executive and if you excluded Executive data space support.

This question only applies 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 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 section of SYSGEN.

EXECUTIVE OPTIONS (Cont.)

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

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 to initially 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.

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 virgin system image. When the virgin system is saved, more space is automatically allocated to the ICB pool.

There must be one ICB, 8(decimal) words long, for every 16(decimal) controllers of a given type which will be loaded in the virgin 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).

This question is not asked if you did not include Executive data space support.

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

This option allows you to include DECnet or other communications products. Refer to the DECnet documentation for details. Note that DECnet must be purchased and installed separately.

If you enter Yes, DCL and alternate CLI support will also be included.

*** CE124 Do you want SPM-11 support? [Y/N D:N]:**

The Software Performance Monitor (SPM-11M-PLUS) is an RSX performance monitoring package which you may purchase from DIGITAL.

If you answer Yes to this question, SYSGEN includes support for SPM-11M-PLUS. Refer to the SPM-11M-PLUS documentation for details.

To use SPM-11M-PLUS, you must have expansion space available for the KW11-P programmable clock that is provided with the SPM-11M-PLUS package.

EXECUTIVE OPTIONS (Cont.)

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

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

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

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

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

*** CE150 Do you want console driver support? [Y/N D:N]:**

This option provides a means of intercepting and logging console terminal messages.

The RSX-11M/M-PLUS System Management Guide describes the Console Output Task (COT) and the console driver.

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

*** CE160 Do you want accounting support? [Y/N D:N]:**

Enter Yes to include support for Resource Accounting. The RSX-11M/M-PLUS System Management Guide describes Resource Accounting.

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

*** CE170 Do you want to include the batch processor? [Y/N D:N]:**

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.

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

*** CE180 Do you want to include the Queue Manager? [Y/N D:N]:**

The Queue Manager (QMG) provides for input and output spooling.

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.

EXECUTIVE OPTIONS (Cont.)

For more information on the Queue Manager, see the RSX-11M/M-PLUS Batch and Queue Operations Manual.

*** CE190 Do you want to include DCL and alternate CLI support? [Y/N D:N]:**

The DIGITAL Command Language (DCL) is compatible among several DIGITAL operating systems.

Alternate CLI support allows you to include user-supplied command line interpreters in your system.

For information on DCL syntax, see the RSX-11M/M-PLUS Command Language Manual. The RSX-11M/M-PLUS System Management Guide contains a chapter on the DCL task and information needed by users who wish to write their own CLI.

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, DCL and alternate CLI support is automatically included and this question does not appear.

*** CE200 Which FCP do you want? [S R:1-6 D:"FCPLRG"]:**

Two versions of the Files-11 ACP (F11ACP) are available on RSX-11M-PLUS.

1. 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 twenty open files. Also included are preaccessed directories, providing for minimum use of system pool.

2. FCPLRG

   This is a 9K-word, nonoverlaid FCP, which provides maximum performance for F11ACP. Since 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 functionality.

The default is FCPLRG.

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

*** CE210 Do you want support for file windows in secondary pool? [Y/N D:N]:**

This option allows the FCP to put file windows in secondary pool instead of primary pool, thus freeing valuable primary pool and reducing the likelihood of pool space problems.

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

EXECUTIVE OPTIONS (Cont.)

*** CE220 Do you want virtual terminal support? [Y/N D:N]:**

Virtual terminal support permits a parent task to simulate terminal I/O for an offspring task.

The RSX-11M/M-PLUS Executive Reference Manual describes virtual terminal support and the associated Executive directives.

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.

*** CE230 What is the default virtual terminal unit buffer**
*** size? [D R:1.-512. D:120.]:**

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 Executive Reference Manual for details.

This question appears only if you selected the User-tailored Executive and you included batch processor support or virtual terminal support.

*** CE240 What is the maximum virtual terminal unit buffer**
*** size? [D R:1.-512. D:184.]:**

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 Executive Reference Manual for details.

This question appears only if you selected the User-tailored Executive and you included batch processor or virtual terminal support.

*** CE260 Enter unsolicited input time-out (in seconds) [D R:0.-255. D:30.]:**

The full-duplex terminal driver discards unsolicited input upon the expiration of the time-out value that you specify (the driver issues a CTRL/U). The valid time-out range is 0 through 255(decimal).

Enter zero to inhibit the full-duplex terminal driver unsolicited input time-out feature.

The default response is 30(decimal) seconds.

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

EXECUTIVE OPTIONS (Cont.)

*** 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. This allows interactive debugging of Executive modules, privileged tasks, I/O drivers, and interrupt service routines.

If you answer Yes to this question, consistency check code is included in the dynamic memory allocation routines.

Note that if you included Executive data space support, XDT does not reduce the available amount of primary pool.

If your target processor is a MICRO/PDP-11, PDP-11/23-PLUS or PDP-11/24 or if you did not include Executive data space support, answering Yes to this question reduces the amount of primary pool.

For more information on XDT, see the RSX-11M-PLUS Guide to Writing an I/O Driver.

*** 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.

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.

The acceptable range is 160000 through 177700(octal).

*** CE290 On what device do you wish crash dumps to be written? [S R:2-3]:**

Enter the device mnemonic of the device on which you want the Executive crash module to write memory dumps. Note that the memory dump device must be part of the target hardware configuration, but not necessarily generated into the target system.

Mnemonics of supported devices are DB, DD, DK, DL, DM, DT, DR, DU, MM, MS, and MT. Enter only the device mnemonic (such as DB), not the unit number.

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 if 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.

EXECUTIVE OPTIONS (Cont.)

*** CE300 What is the physical unit number of the crash unit? [O R:0-7 D:0]:**

Enter the physical unit number (NOT the logical unit number) of the memory dump device.

The acceptable range is 0 through 7(octal). The default is 0.

*** 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.

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 to this question. When the system is bootstrapped, the actual memory size is calculated and overrides the value you enter here.

The default response is 256(decimal).

*** 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.

Enter Yes to include floating-point processor support.

*** 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 KW-11P, or if your system includes a KW-11P but you do not wish to use this clock as your system clock.

If you enter No, you must specify your local line frequency.

EXECUTIVE OPTIONS (Cont.)

*** 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.

3.2.3 Choosing Peripheral Configuration

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.

During 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. This flexibility lessens the importance of precise vector and CSR assignments. 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, you can specify a CSR address of 160000(octal) for that device. CON ignores devices with CSR addresses having 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 the questions in this chapter, often a number of devices with similar characteristics are referred to using 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 sections.

*** CP0604 How many RH controllers do you have? [D R:0.-15. D:4.]:**

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

PERIPHERAL CONFIGURATION (Cont.)

Enter the number of RH controllers in the target configuration.

If you enter zero, the system cannot support DB-, DR-, DS-, EM-, or MM-type devices.

If you enter a number greater than zero, 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 between 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, 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, since the RP04 and RP06 are both DB-type devices. See Appendix B for a list of RSX-11M-PLUS device names and types.

*** 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.

PERIPHERAL CONFIGURATION (Cont.)

*** 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:? [O 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, RM03, RM05, RM80, and 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]:**

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.

If your target configuration includes more than one RH MASSBUS controller, this question appears. Enter Yes if any of the units are dual-access.

*** CP1036 What is the physical unit number of DRn:? [O 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:? [O R:0-7 D:n]:**

Enter the physical unit number for each RS03/04 drive.

PERIPHERAL CONFIGURATION (Cont.)

*** CP1244 To which RH controller is DSn: 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 DSn: 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 EMn:? [O R:0-7 D:n]:**

Enter the physical unit number for each ML11 unit.

*** CP1444 To which RH controller is EMn: 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.]:**

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).

The response to this question specifies the number of TM02/03 magnetic tape formatters.

PERIPHERAL CONFIGURATION (Cont.)

*** 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 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:1-1]:**

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:1.-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).

PERIPHERAL CONFIGURATION (Cont.)

*** 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).

*** CP2204 How many RK11 cartridge disk controllers do you have? [O D:0]:**

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.

Enter the number of RK11 disk controllers in the target configuration.

*** 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 two.

*** 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.

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).

PERIPHERAL CONFIGURATION (Cont.)

*** 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 default the interrupt vector address.

*** 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, the CSR address is 177404.

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 default 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]:**

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.

Enter the number of RK611/711 disk controllers in the target configuration.

*** 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.

PERIPHERAL CONFIGURATION (Cont.)

*** 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.

*** 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.

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 default the interrupt vector address; therefore, you must enter a value within the acceptable range.

PERIPHERAL CONFIGURATION (Cont.)

*** 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 default 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]:**

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.

Enter the number of RL11/RLV11 disk controllers in the target configuration.

*** 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.

*** 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:1-1]:**

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 default the interrupt vector address; therefore, you must enter a value within the acceptable range.

PERIPHERAL CONFIGURATION (Cont.)

*** 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 default 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]:**

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.

Enter the number of RP11 disk controllers in the target configuration.

*** CP2808 How many RP02/RPR02/RP03 disk drives do you**
*** have? [D R:1.-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.

*** 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.

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).

PERIPHERAL CONFIGURATION (Cont.)

Note that subsequent RP11 controllers do not default 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).

Note that subsequent RP11 controllers do not default 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.-63. D:0.]:**

Enter the number of Mass Storage Control Protocol (MSCP) disk controllers in your target configuration. The UDA50 and RQDX1 are MSCP controllers; all of the devices listed in Question CP3008 use an MSCP controller.

*** 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
RC25
RA60
RA80
RA81

The RX50 contains two 5.25-inch floppy 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-medium, Winchester technology disk, with a formatted capacity of 10 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-medium disk drive, with a formatted capacity of 205 megabytes.

The RA80 is a fixed-medium, Winchester technology disk, with a formatted capacity of 121 megabytes.

The RA81 is a fixed-medium, Winchester technology disk, with a formatted capacity of 456 megabytes.

PERIPHERAL CONFIGURATION (Cont.)

*** 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(octal) through 774(octal). The default value for the first MSCP controller (DUA) is 154(octal). Subsequent MSCP controllers do not default the interrupt vector address.

*** 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(octal) through 177700(octal). The default value for the first MSCP controller (DUA) is 172150(octal). Subsequent MSCP controllers do not default the CSR address.

*** CP3076 Enter the number of command rings for DUx [D R:1.-8. D:4.]:**

The only valid responses are 1, 2, 4, or 8.

Your response to this question affects the disk's throughput and the size of the driver.

The number of command rings determines how many commands the driver can queue to the controller at one time.

The number of command rings also affects the size of the driver as follows:

Number of Rings	Additional Bytes
1	70(decimal)
2	138(decimal)
4	274(decimal)
8	546(decimal)

Four command rings are reasonable and adequate for most applications.

The default value for the number of command rings is 4.

*** CP3080 Enter the number of response rings for DUx [D R:1.-8. D:4.]:**

The only valid responses are 1, 2, 4, or 8.

Your response to this question affects the disk's throughput and the size of the driver.

PERIPHERAL CONFIGURATION (Cont.)

The number of response rings determines how many responses the controller can queue to the driver at one time.

The number of response rings also affects the size of the driver as follows:

Number of Rings	Additional Bytes
1	70(decimal)
2	138(decimal)
4	274(decimal)
8	546(decimal)

Four response rings are reasonable and adequate for most applications.

The default value for the number of response rings is 4.

*** 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 zero, you must specify the time-out interval, the interrupt vector address, and the CSR address for each controller.

*** 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 zero.

*** 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 default the interrupt vector address; therefore, you must enter a value within the acceptable range.

PERIPHERAL CONFIGURATION (Cont.)

*** 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 default the CSR address; therefore, you must enter a value within the acceptable range.

*** CP4204 How many TA11 dual cassettes do you have? [O D:0]:**

Enter the number of TA11 dual-drive magnetic tape cassette systems in the target configuration.

If you enter a value greater than zero, you must specify the interrupt vector address and the CSR address for each controller.

*** CP4268 Enter vector address of the next TA11 [O R:60-774 D:260]:**

Enter the interrupt vector address for each TA11 cassette system.

The acceptable range is 60 through 774(octal). The default value for the first TA11 system is 260(octal).

Subsequent TA11 cassette controllers do not default 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 TA11 cassette system.

The acceptable range is 160000 through 177700(octal). The default value for the first system is 177500(octal).

Subsequent TA11 cassette controllers do not default the CSR address; therefore, you must enter a value within the acceptable range.

*** CP4404 How many TS11/TU80/TSV05 magtape controllers do you have? [O D:0]:**

Enter the number of TS11/TU80/TSV05 magnetic tape controllers in the target configuration.

If you enter a value greater than zero, you must specify the interrupt vector address and the CSR address for each controller.

*** CP4468 Enter vector address of the next**
*** TS11/TU80/TSV05 [O R:60-774 D:224]:**

Enter the interrupt vector address for each TS11/TU80/TSV05 magnetic tape controller.

The acceptable range is 60 through 774(octal). The default value for the first controller is 224(octal).

PERIPHERAL CONFIGURATION (Cont.)

Subsequent TS11/TU80/TSV05 controllers do not default 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 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 magnetic tape controllers do not default 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 zero, 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 default the interrupt vector address; therefore, you must enter a value within the acceptable range.

*** 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 default the CSR address; therefore, you must enter a value within the acceptable range.

PERIPHERAL CONFIGURATION (Cont.)

*** CP4676 How many drives does DTx have? [D R:1.-8. D:2.]:**

Each TC11 DECtape controller supports as many as four dual transport TU56 drives.

Enter the number of TU56 drives on the controller.

The acceptable range is 1 through 8.

*** CP4804 How many RX11 disk controllers do you have? [O D:0]:**

The RX11 is the controller for the RX01 floppy disk system. Each RX11 controller can serve as many as two RX01 floppy disk drives.

Enter the number of RX11 floppy disk controllers in the target configuration.

If you enter a value greater than zero, 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 floppy disk controller.

The acceptable range is 60 through 774(octal). The default value for the first RX11 controller is 264(octal).

Subsequent RX11 floppy disk controllers do not default 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 floppy disk controller.

The acceptable range is 160000 through 177700(octal). The default CSR address for the first RX11 controller is 177170(octal).

Subsequent RX11 floppy disk controllers do not default 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.]:**

Each RX11 floppy disk controller supports as many as two RX01 floppy disk drives.

Enter the number of RX01 drives on the controller.

The acceptable range is 1 through 2.

PERIPHERAL CONFIGURATION (Cont.)

*** CP5004 How many RX211 disk controllers do you have? [O D:0]:**

The RX211 is the controller for the dual-density (single or double density) RX02 floppy disk system. Each RX211 controller can serve as many as two RX02 floppy disk drives.

Enter the number of RX211 floppy disk controllers in the target configuration.

If you enter a value greater than zero, 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 [O R:60-774 D:264]:**

Enter the interrupt vector address for each RX211 floppy disk controller.

The acceptable range is 60 through 774(octal). The default value for the first RX211 controller is 264(octal).

Subsequent RX211 floppy disk controllers do not default 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 floppy disk controller.

The acceptable range is 160000 through 177700(octal). The default CSR address for the first RX211 controller is 177170(octal).

Subsequent RX211 floppy disk controllers do not default 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.]:**

Each RX211 floppy disk controller supports as many as two RX02 floppy disk drives.

Enter the number of RX02 drives on the controller.

The acceptable range is 1 through 2.

*** CP5204 How many TU58 controllers do you have? [O D:0]:**

The TU58 is the controller for the DECtape II subsystem. Each TU58 controller can serve as many as two DECtape II drives.

Enter the number of TU58 DECtape II controllers in the target configuration.

If you enter a value greater than zero, 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 default 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 default 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.]:**

Each TU58 DECtape II controller can support as many as two DECtape II drives.

Enter the number of DECtape II drives on the controller.

The acceptable range is 1 through 2.

*** 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 zero, 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 zero.

PERIPHERAL CONFIGURATION (Cont.)

*** 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).

Subsequent line printer controllers do not default 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 default 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 is an optimization performed by the driver to eliminate unnecessary print cycles. You cannot set this characteristic in VMR or MCR. This optimization does not apply to the LN01 printer.

PERIPHERAL CONFIGURATION (Cont.)

If you specify the wrong printer type and the driver performs the optimization for a printer that does not support the optimization, you may 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 the optimization, 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.

*** CP5484 Does LPx have lowercase characters? [Y/N D:N]:**

If this line printer has both uppercase and lowercase characters, answer Yes to this question. If it only has uppercase characters, answer No. Your answer determines the initial setting for lowercase character conversion on this printer. You can change this at any time by using the MCR SET /LOWER command.

*** CP5604 How many TM/TMA/TMB11 magtape controllers do you have? [O D:0]:**

The TM11 is the controller for the TU10, TU10W, TE10, and TS03 tape drives. Each TM11 can serve as many as eight tape drives.

Enter the number of TM11 magnetic tape controllers in the target configuration.

If you enter a value greater than zero, 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 [O 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 default the interrupt vector address; therefore, you must enter a value within the acceptable range.

PERIPHERAL CONFIGURATION (Cont.)

*** CP5672 What is its CSR address? [O 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 default 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.]:**

Each TM11 controller can support as many as eight TU10, TU10W, TE10, or TS03 magnetic tape drives.

Enter the number of magnetic tape drives on the controller.

The acceptable range is 1 through 8.

*** 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 zero, 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 default 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 default the CSR address; therefore, you must enter a value within the acceptable range.

PERIPHERAL CONFIGURATION (Cont.)

*** 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 zero, 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 default the interrupt vector address; therefore, you must enter a value within the acceptable range.

*** 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 default the CSR address; therefore, you must enter a value within the acceptable range.

*** CP6204 How many LPA11 lab subsystems do you have? [D R:0.-16. D:0.]:**

Enter the number of LPA11-K laboratory subsystems in the target configuration.

If you enter a value greater than zero, you must specify the interrupt vector address and the CSR address for each LPA11-K.

*** CP6268 Enter vector address of the next LPA11 [O R:300-774]:**

Enter the interrupt vector address for each LPA11-K subsystem.

The vector address is assigned from floating vector space; consult DIGITAL Field Service if the location is unknown.

The acceptable range is 300 through 774(octal). There is no default.

*** CP6272 What is its CSR address? [O R:160000-177700 D:170460]:**

Enter the CSR address for the LPA11-K subsystem.

The required CSR address is that of the first word of the LPA11-K CSR group. Consult DIGITAL Field Service if the location is unknown.

PERIPHERAL CONFIGURATION (Cont.)

The acceptable range is 160000 through 177700(octal). The default is 170460.

There is no default CSR for a subsequent LPA11-K.

*** CP6280 What is the maximum number of UMRs to be saved? [D R:0.-24. D:5.]:**

The LPA11-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.

*** CP6404 How many IP11 industrial control subsystems do you have? [O D:0]:**

Enter the number of IP11 industrial control I/O subsystems in the target configuration.

Consult the IP11 documentation for details on the IP11 I/O subsystem.

*** CP6408 Treat all controllers as one unit? [Y/N D:N]:**

If you respond Yes, SYSGEN generates one Status Control Block (SCB) and one Unit Control Block (UCB) to cover all IP11 controllers. This creates the appearance of a single, large IP11 controller with all of the I/O modules connected to it. This option results in a loss of system efficiency and also decreases the total number of A/D converters to 16(decimal).

If you respond No, SYSGEN generates one SCB and one UCB for each IP11 controller. Each controller must then be referenced with a different LUN. If you enter No, each controller can support 16(decimal) A/D converters, but the programmer must know which controller a particular I/O module is on, as well as the module index.

For example, consider a PDP-11 that has two IP11 controllers. Controller 0 has one M6011 digital output module (16 points) and eight A014 A/D converter modules. Controller 1 has two M6011 modules (32 points), one M5010 digital input module (32 points), and three A014 modules. If all controllers are treated as one unit (if you answered Yes to Question CP6408), the driver causes the system to respond as if there were only one controller with 48 digital output points (M6011), 32 digital input points (M5010), and 11 A/D converter modules (A014).

*** CP6430 Any latching digital output modules? [Y/N D:N]:**

Because the IP11 device driver determines the system configuration at bootstrap or power-up time, it is not necessary to specify how many of each type of module are present. You are asked whether you have (or will ever have) each module type so that the code to support unused modules will not be assembled.

*** CP6432 Any single-shot output modules? [Y/N D:N]:**

See the description for Question CP6430.

PERIPHERAL CONFIGURATION (Cont.)

*** CP6434 Direct output via QIO? [Y/N D:N]:**

This option allows a task to output to digital or single-shot output modules without overmapping the I/O page. The option simplifies task code but increases overhead.

Note that direct output via QIO support is not required for Fortran support to work. However, if present, direct output with QIO support will not interfere with Fortran support.

This question appears only if you include a latching digital output module or a single-shot output module.

*** CP6436 Any non-interrupting digital sense modules? [Y/N D:N]:**

See the description for Question CP6430.

*** CP6438 Any interrupting digital sense modules? [Y/N D:N]:**

See the description for Question CP6430.

*** CP6440 Any change-of-state modules? [Y/N D:N]:**

See the description for Question CP6430.

*** CP6442 Any counter modules? [Y/N D:N]:**

See the description for Question CP6430.

*** CP6444 Direct input via QIO? [Y/N D:N]:**

This option allows a task to perform digital input with a QIO directive rather than by overmapping the I/O page. The option simplifies task code but increases overhead.

Note that direct input via QIO support is not required for Fortran support to work. However, if present, direct input via QIO support will not interfere with Fortran support.

This question appears only if you responded Yes to one or more of the previous "module" questions.

*** CP6446 Unsolicited interrupt support? [Y/N D:N]:**

The M5011, M5012, and M5013 interrupting modules can produce unsolicited interrupts when certain input bits change state. If you select this option, a task can monitor the interrupts.

This question appears only if you included any interrupting digital sense modules or any change-of-state modules.

PERIPHERAL CONFIGURATION (Cont.)

*** CP6448 Event flag linkage to interrupts? [Y/N D:N]:**

A task can monitor digital interrupts by linking a contiguous group of event flags to interrupting bits. If you select this option, the driver sets the corresponding event flag whenever its associated bit causes an interrupt.

*** CP6450 Any D/A converters? [Y/N D:N]:**

See the description for Question CP6430.

*** CP6452 Any A014 A/D converters? [Y/N D:N]:**

See the description for Question CP6430.

*** CP6454 Any A020 A/D converters? [Y/N D:N]:**

See the description for Question CP6430.

*** CP6456 How many output bytes should be saved on**
*** powerfail? [D R:0.-3048. D:0.]:**

The answer to this query reserves table space in the IP11 driver. If the answer to the query is n, 3*n bytes are reserved.

At powerfail time, if there is not enough space in the table to save all outputs, the excess outputs will be lost and will not be restored.

This question appears only if the system includes one or more output modules, which include the M6010, M6012, and M6013 latching digital output modules, the M6011 single-shot output module, and the A630 D/A converter module.

The acceptable range is 0 through 3048(decimal).

Enter 0 (or press RETURN) to disable output restoration.

*** CP6468 Enter the vector for IP11 controller n [O R:60-774 D:234]:**

Enter the interrupt vector address for each IP11 controller. The standard vector address, and the default value, is 234(octal). If you do not use the default assignment, the acceptable range is 60 through 774(octal).

Consult DIGITAL Field Service if the IP11 vector address is unknown.

Subsequent IP11 controllers are assigned vector addresses from floating vector space and there is no default. Enter a value within the acceptable range.

PERIPHERAL CONFIGURATION (Cont.)

*** CP6472 Enter the base address [O R:160000-177400 D:171000]:**

The acceptable range for the IP11 base address is 160000 through 177400(octal).

Note that this question requests the IP11 base address and not the CSR address. The base address is the CSR address minus 377(octal).

Each IP11 controller occupies 400(octal) bytes in the I/O page. The base address is the beginning of that 400-byte block. The base address must be on a 400-byte address boundary (for example, 171000, 174000, and so on). The base address is not the same as the CSR address. The CSR address is offset 377(octal) from the base address.

For the first IP11 controller, the default base address is 171000(octal); for the second IP11 controller, the default base address is 171400(octal).

The third and subsequent IP11 controllers are assigned base addresses from floating address space and do not have default responses. Enter a value within the acceptable range.

Consult DIGITAL Field Service if the IP11 base address is unknown.

*** CP6804 Enter number of additional DL11/DLV11 line interfaces [O D:0]:**

An RSX-11M-PLUS system requires a DL11/DLV11 line interface for operation. SYSGEN automatically generates the data base for the required DL11/DLV11.

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/DVL11 interfaces used as controllers for TU58 DECtape II drives.

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.

*** 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.

PERIPHERAL CONFIGURATION (Cont.)

RSX-11M-PLUS SYSGEN supports the following types of terminals:

ASR33	LA12	VT05B
ASR35	LA30P	VT50
KSR33	LA30S	VT52
	LA34	VT55
	LA36	VT61
	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
		VT131
		VT132

*** CP6868 Enter vector address of YLx [O R:300-770]:**

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.

You must enter a value within the range 300 through 770(octal). Consult DIGITAL Field Service if the interrupt vector addresses of additional lines are unknown.

*** 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.

*** CP7004 Enter number of DH11/DHV11 asynchronous line**
*** multiplexers [D R:0.-n. D:0.]:**

Enter the number of DH11/DHV11 asynchronous line multiplexers in the target configuration. If your target processor is a MICRO/PDP-11 or PDP-11/23-PLUS, SYSGEN assumes that you have DHV11 multiplexers. In all other cases, SYSGEN assumes that you have DH11 multiplexers.

*** CP7020 Enter total number of DH11/DHV11 dial-up lines [D R:0.-n. D:0.]:**

One DH11 with a DM11-BB interface can serve as many as 16(decimal) remote lines that occupy consecutive line locations. One DHV11 can serve as many as 8 remote lines. The DHV11 does not require a DM11-BB interface.

PERIPHERAL CONFIGURATION (Cont.)

Enter the total number of dial-up lines. For the DH11, the acceptable range is 0 through 16(decimal) times the number of DH11 multiplexers specified in your response to Question CP7004. For the DHV11, the acceptable range is 0 through 8(decimal) times the number of DHV11 multiplexers specified in your response to Question CP7004.

If you specify remote lines, you must enter the answer speed baud rate.

*** CP7028 At which baud rate do you want to answer? [S R:2-5 D:"300"]:**

If your DH11/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 SET /SPEED command.

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.

Acceptable answer speed baud rates for the DHV11 are 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, or 19200. The default answer speed is 300.

*** CP7040 Enter total number of DH11/DHV11 local lines [D R:n.-n. D:n.]:**

Local lines occupy consecutive line locations and DH11/DHV11 multiplexers. Their assignment follows the assignment of any remote lines specified.

The DH11 can serve as many as 16 lines per controller. The DHV11 can serve as many as 8 lines per controller.

*** CP7068 Enter vector address of YHx [O R:300-770]:**

The interrupt vector address for the DH11/DHV11 is assigned from floating vector space starting at location 300(octal). Thus, there is no default vector assignment for the DH11/DHV11.

Enter a vector address in the range 300(octal) through 770(octal). Consult DIGITAL Field Service if the interrupt vector address is unknown.

*** CP7072 What is its CSR address? [O R:160000-177700]:**

The CSR address for the DH11/DHV11 is assigned from floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the DH11/DHV11.

Enter a CSR address in the range 160010(octal) through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

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 responded to Question CP7020 ("total number of dial-up lines") with a number greater than zero, 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). Thus, you must enter a value in the range 300(octal) 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
KSR33	LA30S	VT52
	LA34	VT55
	LA36	VT61
	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
		VT131
		VT132

*** 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 zero, you must specify the interrupt vector address, the CSR address, and the number of lines for each DJ11.

PERIPHERAL CONFIGURATION (Cont.)

*** CP7268 Enter vector address of YJx [O R:300-770]:**

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.

Enter a vector address in the range 300 through 770(octal). Consult DIGITAL Field Service if the vector address is unknown.

*** CP7272 What is its CSR address? [O R:160000-177700]:**

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.

Enter a CSR address in the range 160010 through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

*** 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.

*** 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
KSR33	LA30S	VT52
	LA34	VT55
	LA36	VT61
	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
		VT131
		VT132

*** CP7404 Enter number of DZ11/DZV11 asynchronous line**
*** multiplexers [D R:0.-n. D:0.]:**

Enter the number of DZ11/DZV11 asynchronous line multiplexers in the target configuration.

PERIPHERAL CONFIGURATION (Cont.)

*** CP7420 Do any of the DZ11/DZV11 lines require modem support? [Y/N D:N]:**

The DZ11/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/DZV11 line type (local or remote) by using the /[NO]REMOTE keyword of the MCR SET command (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 SET /SPEED command. 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.

*** CP7468 Enter vector address of YZx [O R:300-770]:**

The interrupt vector address for the DZ11/DZV11 is assigned from floating vector space starting at 300(octal). Thus, there is no default vector assignment for the DZ11/DZV11. Enter a vector address in the range 300(octal) through 770(octal). Consult DIGITAL Field Service if the vector address is unknown.

*** CP7472 What is its CSR address? [O R:160000-177700]:**

The CSR address for the DZ11/DZV11 is assigned from floating address space starting at 160010(octal). Thus, there is no default CSR assignment for the DZ11/DZV11.

Enter a CSR address in the range 160010(octal) through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

*** CP7480 How many lines does YZx have? [D R:1.-n. D:8.]:**

Each DZ11 can serve as many as eight asynchronous lines. Each DZV11 can serve as many as four asynchronous lines.

Enter the total number of lines. The default is 8.

*** 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.

PERIPHERAL CONFIGURATION (Cont.)

RSX-11M-PLUS SYSGEN supports the following types of terminals:

ASR33	LA12	VT05B
ASR35	LA30P	VT50
KSR33	LA30S	VT52
	LA34	VT55
	LA36	VT61
	LA38	VT100
	LA50	VT101
	LA100	VT102
	LA120	VT105
	LA180S	VT125
		VT131
		VT132

*** 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

Do not include any devices that will be used with DECnet. Those devices should be included when you do your NETGEN.

*** 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]:**

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.

Enter a vector address in the range 300(octal) through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

*** CP7872 What is its CSR address? [O R:160000-177700]:**

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.

Enter a CSR address in the range 160010(octal) through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

*** CP8068 Enter vector address of the next PCL11 transmitter [O R:300-774]:**

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.

PERIPHERAL CONFIGURATION (Cont.)

Enter a vector address in the range 300(octal) through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

*** CP8072 What is its CSR address? [O R:160000-177700]:**

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.

Enter a CSR address in the range 160010(octal) through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

*** 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.

*** CP8268 Enter vector address of the next DMC11/DMR11 [O R:300-774]:**

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.

Enter a vector address in the range 300(octal) through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

*** CP8272 What is its CSR address? [O R:160000-177700]:**

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.

Enter a CSR address in the range 160010(octal) through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

*** 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.

PERIPHERAL CONFIGURATION (Cont.)

*** 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]:**

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. Enter a vector address in the range 300(octal) through 774(octal). Consult DIGITAL Field Service if the vector address is unknown.

*** CP8472 What is its CSR address? [O R:160000-177700]:**

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.

Enter a CSR address in the range 160010(octal) through 177700(octal). Consult DIGITAL Field Service if the CSR address is unknown.

*** 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 the expected system load is to be heavy, specify a greater number of sync characters.

There is no default for this question.

*** 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. The device mnemonics you enter must not include a colon (:).

Mnemonics for user-supplied drivers should start with the letters J or Q to avoid conflict with DIGITAL-supplied drivers.

PERIPHERAL CONFIGURATION (Cont.)

The driver source files must reside in UFD [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.

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 answer Yes to this question.

If you answer No to this question, 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 answer Yes to this question.

If you answered 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? [O R:n-774 D:n]:**

The highest interrupt vector address can range from 374(octal) 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.

3.2.4 Assembling the Executive and Drivers

In this section, SYSGEN assembles the Executive, the drivers, and the driver data bases. SYSGEN allows you to decide if 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. Since assembly listings require considerable time to produce and usually are not needed, you should answer 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 UFD [11,34]. This UFD must exist already on the disk. If this UFD does not exist, answer Yes to Question AE030 to pause, then create the UFD using the following command line:

```
>UFD SY:[11,34] RET
```

*** 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.

To continue with SYSGEN after pausing, enter the following command line:

```
>UNS AT. RET
```

SYSGEN then begins assembling the Executive and drivers.

BUILDING EXECUTIVE

3.2.5 Building the Executive and Drivers

In this section, SYSGEN task builds the Executive and the drivers. The Executive and driver task image files are put in UFD [1,54] on the target system disk. If there is an old system from a previous system generation in UFD [1,54], SYSGEN will transfer it to another UFD 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 UFD? [Y/N D:N]:**

If there is an old system image file (RSX11M.SYS) in UFD [1,54] on your target system disk, SYSGEN asks this question to allow you to move that system and its associated files to another UFD before building the new system in [1,54].

If you want to save files on the target disk from a previous SYSGEN, answer Yes to this question. SYSGEN asks you to enter the UFD to which you wish to move the files, then copies the contents of UFD [1,54] to the UFD you designate.

*** BE020 What UFD do you want to move it to ([g,m])? [S R:3.-9.]:**

Enter the UFD to which you wish to move the system currently in [1,54]. SYSGEN creates this UFD if it does not already exist and moves the files in [1,54] to the specified UFD.

*** BE030 Do you want to pause to edit any files before**
*** task-building? [Y/N D:N]:**

In 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
- SYSVMR.CMD, the system image initialization command file

If you are doing a complete SYSGEN (that is, if you answered Yes to Question SU120), or if you are continuing a SYSGEN from some point (that is, if you answered Yes to Question SU130) SYSGEN does not give you any further opportunities to pause. After this question, SYSGEN builds the Executive and drivers, then proceeds to the Building the Privileged Tasks and Creating the System Image File 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.

To continue with SYSGEN after pausing, enter the following command line:

```
>UNS AT. RET
```

BUILDING PRIVILEGED TASKS

3.2.6 Building the Privileged Tasks

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]:**

Enter Yes if you wish to produce task-build maps of the microcode loader and requestor tasks.

Since the maps require time to produce and usually are not needed, you should answer No.

This question appears only if you included an LPA11-K laboratory subsystem in your system (Question CP6204).

*** BP020 Enter the microcode version desired for LPA-11 unit n [0 R:0-2 D:1]:**

The LPA11-K may be loaded with one of three versions of the microcode:

0 Multi-request mode
1 Dedicated mode A/D input
2 Dedicated mode D/A output

See the LPA11-K documentation for information on the versions of the microcode.

This question appears only if you included an LPA11-K laboratory subsystem in your system (Question CP6204).

*** BP030 Is the lab I/O on this LPA-11 an AR11? [Y/N D:N]:**

The lab I/O on an LPA11-K can be handled either by K-Series/LPS-11 or AR11. If you answer No to this question, K-Series/LPS-11 is assumed.

This question appears only if you included an LPA11-K laboratory subsystem in your system (Question CP6204).

*** 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. Since the maps require considerable time to produce and usually are are not needed, you should answer 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 UFD [1,34]. This UFD must already exist on the disk.

BUILDING PRIVILEGED TASKS (Cont.)

*** BP060 Do you want to pause to edit any files before**
*** task-building? [Y/N D:N]:**

This question is asked 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 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.

The MCR INS command 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.

To continue with SYSGEN after pausing, enter the following command line:

```
>UNS AT. RET
```

If you answer No, or after you finish editing, SYSGEN builds the privileged tasks.

BUILDING NONPRIVILEGED TASKS

3.2.7 Building the Nonprivileged Tasks

This section allows you to rebuild any nonprivileged system tasks that you have patched. You may have applied patches either manually or through an Update. DIGITAL-supplied nonprivileged system tasks are prebuilt and can be found in the library UFD on the target system disk. If you have not patched any of the nonprivileged tasks listed in Question BN020, you should skip over this section by answering 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 section of SYSGEN.

You can use the xxxFSL.TSK tasks if you have a PDP-11/70 or PDP-11/44 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 answered Yes to Question CE090. Even if you answered 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 which 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, since the distribution kit contains prebuilt copies of all the tasks listed in Question BN020.

BUILDING NONPRIVILEGED TASKS (Cont.)

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.

Answers to the questions asked in this section are placed in the saved answer file [200,200]SYSGENSA3.CMD. 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 section.

*** BN010 Do you want to rebuild any nonprivileged tasks? [Y/N D:N]:**

Enter Yes if you have patched any of the nonprivileged system tasks (see the list in the description accompanying Question BN020) or if you have applied an Update to your target system disk.

Enter No if you have not patched any of the nonprivileged system tasks, either manually or by applying an Update.

NOTE

SYSGEN builds the nonprivileged tasks in UFD [1,54]. You must move any nonprivileged tasks that you rebuild in this section from [1,54] to your library UFD. You can do this after SYSGEN has finished. See Chapter 4 for more information.

*** BN020 Enter task name(s) [S]:**

Enter the names of the tasks you wish to rebuild, choosing from the following list:

BAD	DMPFSL	IOX	RPTFSL
BRU	DSC	IOXRES	SLP
CDA	EDI	IOXFSL	SLPRES
CDARES	EDIRES	LBR	SLPFSL
CDAFSL	EDIFSL	LBRRES	STK
CFL	EDT	LBRFSL	STKFSL
CFLFSL	EDTRES	MAC	TDX
CMP	EDTFSL	MACRES	TKB
CMPRES	FLX	MACFSL	TKBRES
CMPFSL	FLXRES	PAT	TKBFSL
CON	FLXFSL	PATRES	VFY
CRF	FMT	PATFSL	VFYRES
CRFRES	FTB	PIP	VFYFSL
CRFFSL	FTBRES	PIPRES	VMR
DCL	FTBFSL	PIPFSL	ZAP
DLD	ICM	QMGCLI	ZAPRES
DMP	ICMRES	QMGPRT	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.

BUILDING NONPRIVILEGED TASKS (Cont.)

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.

*** BN030 Do you want the maps of the nonprivileged tasks? [Y/N D:N]:**

Enter Yes if you wish to produce task-build maps of the nonprivileged tasks. Since the maps require considerable time to produce and usually are not needed, you should answer No.

*** BN040 What is to be the map device [ddu:]? [S R:2-5 D:"SY:"]:**

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 UFD [1,34]. This UFD must already exist on the disk. If this UFD does not exist, answer Yes to Question BN050 to pause, then create the UFD using the following command line:

```
>UFD SY:[1,34] (RET)
```

*** BN050 Do you want to pause to edit any files before**
*** task-building? [Y/N D:N]:**

Enter Yes to pause. Enter No to begin building the nonprivileged tasks you specified.

To continue with SYSGEN after pausing, enter the following command line:

```
>UNS AT. (RET)
```

CREATING SYSTEM IMAGE FILE

3.2.8 Creating the System Image File

In this section, SYSGEN creates and initializes the system image file. A VMR indirect command file named SYSVMR.CMD 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.CMD.

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 is only asked 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.CMD, 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 may be too small. If you have a smaller system with few terminals and open files, this 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 answer Yes to this question, SYSGEN pauses and allows you to invoke an editor and edit SYSVMR.CMD. To continue with SYSGEN after pausing, enter the following command line:

```
>UNS AT. RET
```

If you answer No to this question, SYSGEN immediately continues.

CREATING SYSTEM IMAGE FILE (Cont.)

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 OU: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 are 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 be helpful to you in setting up and running your system.

4.1 BOOTSTRAPPING AND SAVING THE VIRGIN SYSTEM

If you have completed performing SYSGEN as detailed in Chapter 3, your target system disk contains a bootstrappable virgin RSX-11M-PLUS system image.

To bootstrap the virgin system and to save the system image, do the following:

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:RSX11MPBL15 (RET)
   ```

2. Assign logical device SY: to your target system disk and software bootstrap the virgin system. Note that this step should not be performed on an on-line system unless you are the only user logged on, since software bootstrapping the target system stops the host system.

   For example, if your target system disk is DB0:, use the following command sequence:

   ```
   >ASN DB0:=SY: (RET)
   >BOO [1,54] (RET)
   ```

   The BOO command brings the virgin 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 4.10.

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: 15

   XDT>G
   RSX-11M-PLUS V2.1  BL15
   ```

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-MAR-82 (RET)
```

5. To verify that your system is working, enter a TIM command. If the system responds, it is an indication that the system works properly. For example:

```
>TIM (RET)
09:42:03 13-MAR-82
```

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 start-up command file, [1,2]STARTUP.CMD.

7. When STARTUP.CMD prompts you for the time and date, type CTRL/Z to exit from the start-up 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)
DM0 -- SYSTEM dismounted from DB0:    *** Final dismount initiated ***
>
 RSX-11M-PLUS  V2.1  BL15  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 in determining the source of difficulties encountered 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 start-up command file, see Section 4.5.1 in this chapter.

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 RC25 or RL02 pregenerated systems, see Chapter 5.) If you do not want to use a disk pack, you should back up your new system to magnetic tape; you can later 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 the system generation process or for user reference. Once you have completed a SYSGEN, you can delete these files from your system disk. This 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 UFD [0,0])
- All [1,*] files
- All files in the library UFD (normally [3,54])
- All files in the system UFD (normally [1,54])

Copying your target disk to another disk using BRU reorganizes the system files and provides the largest possible contiguous space.

4.4 TESTING THE SYSTEM

The User Environment Test Package (UETP) may be used to verify the integrity and operation of newly generated systems. The package consists of several Indirect command files that verify the presence and operation of devices, test the basic Executive features, and verify the presence of system utilities.

See Chapter 9 of the RSX-11M/M-PLUS System Management Guide for information on using UETP.

4.5 OTHER SYSTEM SETUP INFORMATION

The following sections describe various tasks the system manager should perform to prepare a newly generated system for general use.

4.5.1 The Start-Up Command File

Each time the system is bootstrapped, the file named [1,2]STARTUP.CMD is invoked. The prototype start-up 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 to your particular system needs.

The following are functions commonly performed at system start-up:

- Allocate system-controlled checkpoint space
- Bring on line all devices configured into the system
- Start the Console Logger
- Start system Error Logging
- Initialize the DIGITAL Command Language (DCL) and any user-supplied CLIs
- Start Resource Accounting
- Start the Queue Manager and batch processor
- Set the speed and type of terminals
- Install resident libraries, utilities, system and user tasks

Certain system privileged and nonprivileged tasks are installed by [1,54]SYSVMR.CMD when you create the system image file using SYSGEN. You will probably want to install additional system and user tasks in your system, or 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. In this way, the tasks will be installed as soon as the system is bootstrapped. You can do this by using VMR commands directly, or you can run the Creating the System Image section of SYSGEN again and edit SYSVMR.CMD to install tasks or change certain system characteristics to suit your needs. You should choose this way 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 STARTUP.CMD. You can use the features of the Indirect Command Processor to conditionally install tasks or perform other system initialization duties. If you have not edited SYSVMR.CMD, STARTUP.CMD can serve as a record of the changes and additions you have made to the "standard" system.

4.5.2 Installing the RMS-11 Tasks, Utilities, and Libraries

RMS-11 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.CMD file supplied on the distribution kit contains all the necessary installation commands. If you wish to use RMS-11, activate these commands by editing LB:[1,2]STARTUP.CMD 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/RMS-11 Release Notes. See RMS-11: An Introduction for information on using RMS-11.

4.5.3 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.

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.

4.5.4 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
```

You should change the passwords to these accounts as the first step in setting up an account file, to preserve the security of your system.

The [200,1] account is supplied for use in conjunction with the warm-up session presented in the Introduction to RSX-11M and RSX-11M-PLUS. See also Section 4.5.5 in this manual.

4.5.5 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 UFD [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.

In UFD [200,1] on your target system disk are introductory files used with the warm-up session for new users presented in the Introduction to RSX-11M and RSX-11M-PLUS manual. 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 to follow along with the warm-up session.

UFD [200,1] 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).

4.5.6 Installing and Using System Tasks

Many privileged and nonprivileged system tasks are installed in your system image by [1,54]SYSVMR.CMD when you create the system image file using SYSGEN. You can install other system tasks that you may wish to use through STARTUP.CMD, SYSVMR.CMD, or by hand. See Section 4.5.1.

If you built any of the nonprivileged system tasks in the Building the Nonprivileged Tasks section of SYSGEN, there will be new task images for those tasks in UFD [1,54]. You should move these tasks to your system's library UFD, which is normally [3,54].

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 answering 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 answered 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.

4.6 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.

4.7 FINDING OUT MORE ABOUT THE SYSTEM

The purpose of this manual is to enable you to generate a working RSX-11M-PLUS operating system for your hardware configuration. There is other information, though, that you will need to operate and adjust your system.

If you are not already familiar with RSX-11M-PLUS, you should read the Introduction to RSX-11M and 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:

By subject area
- Introduction to RSX-11M-PLUS
- Command Interfaces
- System Structure and Operation
- Applications and System Programming

By user area
- User Level Interfacing With the System
- Applications Programming
- System Programming
- Managing System Resources

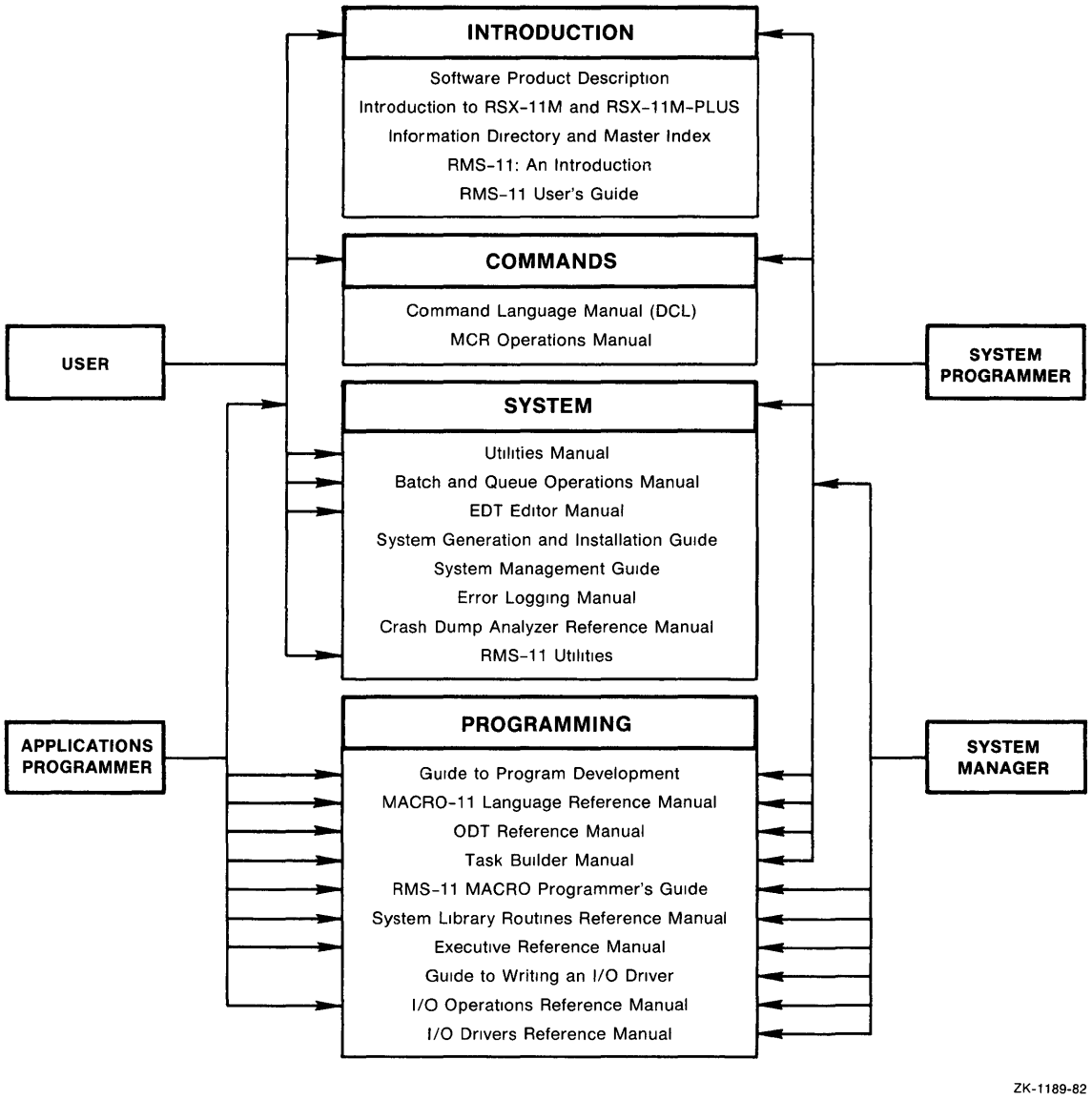

Figure 4-1 Subjective and Functional Organization of the Documentation

4.8 CHANGING THE SYSTEM WITHOUT REPEATING SYSGEN

You must perform a new system generation if you wish to choose different Executive options or 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.

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:

- Alter system parameters and terminal characteristics in SYSVMR.CMD
- Change device CSR and vector addresses using the VMR or MCR CON SET command
- Change the device configuration for devices that were generated with loadable data bases
- Add loadable drivers for devices not included during system generation
- Rebuild any of the nonprivileged tasks

4.8.1 Altering System Parameters Using VMR

The following system parameters are set and functions performed in the SYSVMR.CMD file:

- Set secondary pool size
- Create partitions
- Set the size of the terminal data space buffers (TTCOM)
- Load drivers
- Install directive commons
- Install privileged and nonprivileged tasks
- Set the round-robin scheduling interval and priority range
- Set the Executive-level disk swapping interval and priority range
- Set pool limit parameters for the Pool Monitoring Task (PMT)
- Set terminal line speed, buffer size, terminal type, and other characteristics

To alter system parameters using VMR, edit [1,54]SYSVMR.CMD where necessary, 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.

4.8.2 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.

If you are adding a device type that does not exist in your current system, invoke SYSGEN and choose the Adding a Device 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 section of SYSGEN to create a new loadable data base and reassemble and rebuild the driver. You must then recreate 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 4.8.2.1.

To add a device or change a device's configuration, invoke SYSGEN and answer 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 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 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 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.CMD 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

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.

4.8.2.1 **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 and cannot be added or changed without performing a complete SYSGEN:

TT:	All terminals
LA:	LPA11-K laboratory peripheral accelerator
IP:	IP11 industrial control subsystem

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 (device mnemonics DB, DR, DS, EM, or MM) 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 on adding new devices after SYSGEN is the highest interrupt vector address generated into your system. During SYSGEN, at the end of the Choosing Peripheral Configuration section, SYSGEN asks for the highest interrupt vector address in your system. You cannot add any device with a vector address that is higher than the highest interrupt vector address that you specified. For that reason, you should always specify a highest interrupt vector address of 774(octal) during SYSGEN, if you intend to add devices later.

4.8.3 Rebuilding Nonprivileged Tasks

You can rebuild nonprivileged tasks at any time by invoking SYSGEN and selecting the Building the Nonprivileged Tasks section. See Chapter 3 for a description of the questions asked in this section.

4.9 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 UFD separate copies of the system image file and all privileged task files. The nonprivileged task files in the library UFD can be shared by both systems, as can the system libraries in UFD [1,1].

NOTE

The following procedure for putting two RSX-11M-PLUS systems on a single disk volume assumes that both of the systems are RSX-11M-PLUS Version 2.1 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. 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.** In the example, 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. The example assumes that both SY: and DB1: are 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)
```

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 V2.1  BL15
>SET /SYSUIC=[4,54] (RET)
>SET /LIBUIC=[3,54] (RET)
>SAV (RET)

 RSX-11M-PLUS V2.1  BL15   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.

4.10 SYSTEM INITIALIZATION ERRORS

When a virgin 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.

If your system does not have XDT, INITL halts the processor. Two possibilities exist:

- 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 BPT (breakpoint trap) 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; therefore, you must correct the problem and rebootstrap the system.

4.10.1 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 CON SET command 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 CON SET command.

Warning -- Device xx Vector in use

Explanation: INITL finds that the vector for device xx points to 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 CON SET command to correct this).

4.10.2 System Initialization FATAL Messages

The following are the possible INITL fatal error messages:

Fatal error -- Boot device not found in system tables:
R0=device type (ASCII)
R1=Physical unit number
R2=CSR address

Explanation: You have bootstrapped your system from a device for which there is no data base in your generated system. For example, you might have a hardware configuration that contains four DB-type devices but the RSX-11M-PLUS system you are running has only two DB-type devices generated into it.

User Action: Bootstrap your system from a device that is present in your running system.

Fatal error -- { ccaa / unit ddnn: } didn't come online
error code in R1

Explanation: If a controller mnemonic appears in the message, the driver database contains the wrong CSR address, or there is an error in the driver. If a device unit mnemonic appears, there is an error in the driver.

User Action: If the problem is an incorrect CSR address, you can change the faulty CSR address using the VMR CON SET command. If there is an error in a DIGITAL-supplied driver, submit a Software Performance Report (SPR) to DIGITAL. If there is an error in a user-supplied driver, you must diagnose and correct the error.

Fatal error -- Device xx Driver does not support controller type

Explanation: There is either an error in the driver or the driver was assembled with the wrong RSXMC file.

User Action: If there is an error in the driver and it is DIGITAL-supplied, submit an SPR to DIGITAL. If the driver is not the problem, reassemble the driver using the proper RSXMC file.

Fatal error -- Device xx Driver not loaded

Explanation: You have not loaded the driver.

User Action: Load the driver using VMR and reboot your system.

Fatal error -- Directive partition not fixed in memory

Explanation: You have not fixed your directive partition in memory.

User Action: Use VMR to load and fix the directive partition into your system image.

Fatal error -- Driver didn't return control after { controller / unit } online call

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, please submit an 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 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 SET command 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 that you spend 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, step-by-step, through those operations.

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. 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 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 V2.0 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 start-up procedure identifies the peripheral devices connected to your processor and performs various other housekeeping tasks. Once the start-up procedure is finished, you can begin using your RSX-11M-PLUS system immediately.

In order for the automatic system start-up 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 or PDP-11/24 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, consult DIGITAL Field Service.

Two pregenerated system images are provided on the kit disk, one for use on PDP-11/70 and PDP-11/44 processors, the other for use on PDP-11/24, PDP-11/23-PLUS, and MICRO/PDP-11 processors.

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 need to 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 later change and you need to set up your system differently. The procedures described in the following sections require that you 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 MICRO/PDP-11 processor, you might wish to copy the kit to the RD51 fixed disk.

If you 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 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. Physically mount the kit disk and the output disk on their respective drives. If you are not familiar with the procedure for physically mounting RL02 disks, 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 start-up procedure is automatically invoked and prompts you for the date and time. Type CTRL/Z in response to the prompt to exit from the start-up 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 V2.1  BL15   512.KW  System:"PREGEN"
>RED DL:=SY:
>RED DL:=LB:
>RED DL:=SP:
>MOU DL:"PREGENNEDSYS"
>@DL:[1,2]STARTUP

                        Startup - Initializing

                    RSX-11M-PLUS PREGEN system startup procedure

Step  1 - Setting system time and date

          Please enter the time and date (hh:mm dd-mmm-yy)
          Time and date : (CTRL/Z)
```

If you cannot bootstrap your system, check your system's site configuration documentation or consult DIGITAL Field Service to see if 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, 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 02/01/83 (RET)
>TIM (RET)
11:45:01 1-FEB-83
>
```

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
>
BAD> DL1:/LIST (RET)
BAD -- DL1: 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 ten), 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 DL0: and the output disk is mounted on DL1:, use the following command sequence:

```
>RUN BRU (RET)
>
BRU>/VERIFY (RET)
From:    DL0: (RET)
To:      DL1: (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 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 UFD [1,54] is an RSX-11M-PLUS system task file that **does not** take advantage of instruction- and data-space hardware. (For clarity, this chapter refers to this system as "the [1,54] system.") This system is intended primarily for the MICRO/PDP-11, 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, the Software Performance Monitor (SPM-11), and parity memory has also been omitted from this system.

The [1,54] system can also run on the PDP-11/44 and PDP-11/70 processors. Note, though, that when you run the [1,54] system on PDP-11/44 and PDP-11/70 processors, the system does not take advantage of the I- and D-space mapping hardware incorporated in those processors.

When you hardware bootstrapped your kit disk for copying, the [1,54] system was the system that began running.

In UFD [2,54] is an RSX-11M-PLUS system image that **does** take advantage of instruction- and data-space hardware. (This chapter refers to this system as "the [2,54] system.") This system can be run only on the PDP-11/70 and PDP-11/44 processors, both of which incorporate I- and D-space mapping hardware. If you are running the pregenerated system on either 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).

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, physically mount the system disk in a drive on your system. If you are not familiar with the procedure for physically mounting RL02 disks, 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 start-up procedure is automatically invoked and prompts you for the date and time. Type CTRL/Z in response to the prompt to exit from the start-up 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 V2.1  BL15   512.KW  System:"PREGEN"
>RED DL1:=SY:
>RED DL1:=LB:
>RED DL1:=SP:
>MOU DL1:"PREGENNEDSYS"
>@DL1:[1,2]STARTUP

                        Startup - Initializing


                    RSX-11M-PLUS PREGEN system startup procedure


Step  1 - Setting system time and date

          Please enter the time and date (hh:mm dd-mmm-yy)
          Time and date : (CTRL/Z)
```

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)
```

   This brings the [2,54] system into memory, and the system prints an identification message. The system start-up procedure is automatically invoked again, and prompts you for the date and time. Type CTRL/Z to exit from the start-up procedure.

The following is an example of software bootstrapping the [2,54] system:

```
RSX-11M-PLUS V2.1  BL15   384.KW  System:"PREGEN"
>RED DL1:=SY:
>RED DL1:=LB:
>RED DL1:=SP:
>MOU DL1:"PREGENNEDSYS"
>@DL1:[1,2]STARTUP

                        Startup - Initializing


                    RSX-11M-PLUS PREGEN system startup procedure


     Step  1 - Setting system time and date

               Please enter the time and date (hh:mm dd-mmm-yy)
               Time and date : CTRL/Z
```

Remember that the [2,54] system only runs on the PDP-11/44 and PDP-11/70 processors. 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 /WB RET
```

This makes the [2,54] system hardware-bootstrappable. The [2,54] system begins running again, and the start-up procedure is automatically invoked once again. Type CTRL/Z in response to the prompt to exit from the start-up procedure.

The following is an example of making the [2,54] system hardware-bootstrappable:

```
>SAV /WB RET
DMO -- System disk being dismounted
DMO -- SYSTEM dismounted from DL1:    *** Final dismount initiated ***
12:10:17  *** DL1:  -- Dismount complete
>


RSX-11M-PLUS V2.1  BL15   512.KW  System:"PREGEN"
>RED DL1:=SY:
>RED DL1:=LB:
>RED DL1:=SP:
>MOU DL1:"PREGENNEDSYS"
>@DL1:[1,2]STARTUP

                        Startup - Initializing


                    RSX-11M-PLUS PREGEN system startup procedure


     Step  1 - Setting system time and date

               Please enter the time and date (hh:mm dd-mmm-yy)
               Time and date : CTRL/Z
```

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 (RET)
   ```

   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 that you want to delete the unused system.

6. When the DELETESYS.CMD procedure finishes, the installation of your pregenerated system is complete. Turn next to Section 5.4 for information on other system set-up operations.

The following is an example of invoking the DELETESYS.CMD procedure to delete the [2,54] system:

```
>@[1,2]DELETESYS (RET)

This procedure deletes those files specific to the currently non-active
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 (RET)

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 (RET)


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

>
```

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 or other DU-type disk. (The DU-type disks include the RA60, RA80, RA81, and RD51). 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. Physically mount the kit disk and the output disk on their respective drives. If you are not familiar with the procedure for physically mounting either of the disks, consult the hardware documentation for the appropriate disk drives.
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 start-up procedure is automatically invoked and prompts you for the date and time. Type CTRL/Z in response to the prompt to exit from the start-up 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 DL0: on a PDP/11-23-PLUS processor:

```
TESTING MEMORY
0256.KW
START? DL (RET)


RSX-11M-PLUS V2.1  BL15   256.KW  System:"PREGEN"
>RED DL:=SY:
>RED DL:=LB:
>RED DL:=SP:
>MOU DL:"PREGENNEDSYS"
>@DL:[1,2]STARTUP

                          Startup - Initializing


                     RSX-11M-PLUS PREGEN system startup procedure

Step  1 - Setting system time and date

          Please enter the time and date (hh:mm dd-mmm-yy)
          Time and date : (CTRL/Z)
```

If you cannot bootstrap your system, check your system's site configuration documentation or consult DIGITAL Field Service to see if 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, then runs the Stand-Alone Configuration and Disk Sizing Program (CNF).

4. 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)
```

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 04/01/83 (RET)
>TIM (RET)
10:17:01 1-APR-83
>
```

6. Run the Bad Block Locator Utility (BAD) on your output disk. For example, if your output device is DU0:, use the following command sequence:

```
>RUN BAD
>
BAD> DU0:/LIST (RET)
BAD -- DU0: 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 ten), 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 DL0: and the output disk is an RD51 drive designated DU0:, use the following command sequence:

```
>RUN BRU (RET)
>
BRU>/VERIFY/MAX:9633/HEADERS:1204 (RET)
From:    DL0: (RET)
To:      DU0: (RET)
BRU - Starting verify pass

BRU - Completed

BRU> (CTRL/Z)
```

You should alter the values specified in the /MAX and /HEADERS switches to suit the output disk volume. Use the appropriate values from Table 5-1 for the arguments of the /MAX and /HEADERS switches.

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 pack (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.

Table 5-1
Disk Initialization Qualifier Values

Device	Value for /MAX Switch	Value for /HEADERS Switch
RA60	24617	12308
RA80	14629	7314
RA81	54815	51699
RD51	9633	1204

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 UFD [1,54] is an RSX-11M-PLUS system task file that **does not** take advantage of instruction- and data-space hardware. (For clarity, this chapter refers to this system as "the [1,54] system.") This system is intended primarily for the MICRO/PDP-11, 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, the Software Performance Monitor (SPM-11), and parity memory has also been omitted from this system.

The [1,54] system can also run on the PDP-11/44 and PDP-11/70 processors. Note, though, that when you run the [1,54] system on PDP-11/44 and PDP-11/70 processors, the system does not take advantage of the I- and D-space mapping hardware incorporated in those processors.

When you hardware bootstrapped your kit disk for copying, the [1,54] system was the system that began running.

In UFD [2,54] is an RSX-11M-PLUS system image that **does** take advantage of instruction- and data-space hardware. (This chapter refers to this system as "the [2,54] system.") This system can be run only on the PDP-11/70 and PDP-11/44 processors, both of which incorporate I- and D-space mapping hardware. If you are running the pregenerated system on either 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).

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 start-up procedure is automatically invoked and prompts you for the date and time. Enter CTRL/Z in response to the prompt to exit from the start-up procedure.

2. Write-protect the kit disk, using the write-protect switch on the drive.

3. If the system disk is any DU-type disk, install the RCT task using the following MCR command line:

   ```
   >INS $RCT (RET)
   ```

4. Load the DU: driver, using the following MCR command line:

   ```
   >LOA DU:/PAR=GEN (RET)
   ```

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 DU0:, use the following MCR command line:

   ```
   >MOU DU0:PREGENNEDSYS (RET)
   ```

7. Set your default UFD to [1,54] if you intend to use the [1,54] system. Set your default UFD 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 DU0:, use the following MCR command sequence:

```
>ASN DU0:=SY: (RET)
>ASN DU0:=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.CMD 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 **Bootstrap and Save 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 recreated the system image in UFD [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 V2.1  BL15
```

2. Save the system and make it hardware-bootstrappable, using the following MCR commmand line:

```
>SAV /WB (RET)
```

The system prints an identification message, and the system start-up procedure is invoked and prompts you for the date and time. Enter the current date and time.

The following is an example of making the [1,54] system hardware-bootstrappable:

```
>SAV /WB (RET)
DMO -- System disk being dismounted
DMO -- SYSTEM dismounted from DU0:    *** Final dismount initiated ***
10:50:12  *** DU0:  -- Dismount complete
>


RSX-11M-PLUS V2.1  BL15   512.KW  System:"PREGEN"
>RED DU0:=SY:
>RED DU0:=LB:
>RED DU0:=SP:
>MOU DU0:"PREGENNEDSYS"
>@DU0:[1,2]STARTUP

                    Startup - Initializing


                RSX-11M-PLUS PREGEN system startup procedure


Step  1 - Setting system time and date

          Please enter time and date (hh:mm dd-mmm-yy)
          Time and date : 10:50:50 1-APR-83

                    .

                    .

                    .
```

3. When the start-up procedure finishes, your system disk contains a hardware-bootstrappable system.

You must now delete the system image and files of the system that you do not intend to use.

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 start-up command file is automatically invoked and prompts you for the date and time. Type CTRL/Z in response to the prompt to exit from the start-up 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.CMD that makes deleting the unused system easy. Invoke this procedure using the following MCR command line:

```
>@[1,2]DELETESYS (RET)
```

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 that you want to delete the files.

3. When the DELETESYS.CMD procedure finishes, the installation of your pregenerated system is complete. Turn next to Section 5.4 for information on other system set-up operations.

The following is a sample of a terminal trace produced by a user invoking the DELETESYS.CMD procedure to delete the [1,54] system:

```
>@[1,2]DELETESYS (RET)

This procedure deletes those files specific to the currently non-active
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 (RET)

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? Y (RET)


The following display shows the number of blocks used and the number
of blocks free before deleting anything.


DU0: has 949. blocks free, 18251.  blocks used out of 19200.
Largest contiguous space = 949. blocks
664. file headers are free, 540. headers used out of 1204.


Deleting...

The following display shows the number of blocks used and the number
now free for use on the system disk.


DU0: has 5450. blocks free, 13760.  blocks used out of 19200.
Largest contiguous space = 4335. blocks
770. file headers are free, 434. headers used out of xxxx.


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? Y



RSX-11M-PLUS V2.1  BL15   512.K  System:"PREGEN"
>RED DL:=SY:
>RED DL:=LB:
>RED DL:=SP:
>MOU DL:"PREGENNEDSYS"
>@DL:[1,2]STARTUP

                    Startup - Initializing


               RSX-11M-PLUS PREGEN system startup procedure


Step  1 - Setting system time and date

          Please enter time and date (hh:mm dd-mmm-yy)
          Time and date : ^Z
>BOO [6,54]BRUSYS

RSX-11M/RSX-11M-PLUS Standalone Copy System V02


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


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 V2.1  BL15   512.K  System:"PREGEN"
>RED DL1:=SY:
>RED DL1:=LB:
>RED DL1:=SP:
>MOU DL1:"PREGENNEDSYS"
>@DL1:[1,2]STARTUP

                    Startup - Initializing

                RSX-11M-PLUS PREGEN system startup procedure


Step  1 - Setting system time and date

          Please enter time and date (hh:mm dd-mmm-yy)
          Time and date : ^Z
>@[1,2]DELETESYS

This procedure deletes those files specific to the currently non-active
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.


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 V2.1  BL15   512.K  System:"PREGEN"
>RED DL:=SY:
>RED DL:=LB:
>RED DL:=SP:
>MOU DL:"PREGENNEDSYS"
>@DL:[1,2]STARTUP

                    Startup - Initializing


               RSX-11M-PLUS PREGEN system startup procedure


Step  1 - Setting system time and date

          Please enter time and date (hh:mm dd-mmm-yy)
          Time and date : 13:30 6-JUN-83


Step  2 - Deallocating DECnet communications executive
          System configuration does not include DECnet

Step  3 - Installation of DAPRES
          System configuration does not include RMS DECnet (DAPRES)

Step  4 - Allocating checkpoint space
          System checkpoint file size is 1024. blocks

Step  5 - Loading auxiliary device drivers
          No auxiliary driver will be loaded

Step  6 - Establishing device configuration
          All available devices will be configured on-line

          (Note: Depending upon system configuration,
                 this may take up to a minute to complete)
```

```
Step  7 - Starting error logging
          Error logging will be started

Step  8 - Setting terminal characteristics
          Terminal:TT0:  Type:LA120 Speed:Fixed Case:NOLOWER

Step  9 - Creating command interpreters

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.                                          *
*                                                                       *
*       3) You may wish to modify the following text and command        *
*          files to suit your installation                              *
*                                                                       *
*          File                 Purpose                                 *
*          ----                 -------                                 *
*          [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 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                          *
*                                                                       *
*************************************************************************
```

```
**************************************************************************
*                                                                        *
*                Installation of the RSX-11M-PLUS PREGEN                 *
*                                                                        *
*             distribution media has completed successfully              *
*                                                                        *
**************************************************************************

>
>SET /CRASH_DEVICE
CRASH_DEVICE=DL1:
```

5.4 SYSTEM SETUP INFORMATION

You now have a running RSX-11M-PLUS system. You can use the system without further customization or tailoring.

More likely, though, you will want to perform some further tailoring of the system to adjust system parameters, edit system files, make use of peripheral devices, or install layered products and other applications.

The following sections describe various tasks that you probably will want to perform to prepare the system for general use or for your application.

5.4.1 Changing the Start-Up Procedure to Suit Your System

Whenever you bootstrap your system disk, the system start-up procedure is automatically invoked. This procedure, controlled by a command file named STARTUP.CMD, performs various housekeeping tasks, determines the peripheral configuration, and brings all available peripheral devices on-line. After the start-up procedure finishes, you can begin to use your system.

In order for the automatic system start-up 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 or PDP-11/24 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, consult DIGITAL Field Service.

If, after the start-up procedure has finished, you are unable to use a particular peripheral device connected to your system, you should check to see if 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 start-up procedure to suit your hardware and your requirements. For example, if you install DECnet, you can change the start-up procedure so that DECnet will be started up automatically each time you bootstrap the system. You might also wish to change the start-up procedure to set the characteristics of the terminals connected to your system, or to install applications.

This section explains how the start-up procedure works, and shows you how to edit the procedure to suit your needs.

5.4.1.1 **How the Start-Up Procedure Works** - The start-up procedure is controlled by [1,2]STARTUP.CMD. This file invokes [1,2]READCON.CMD, which then reads statements in the configuration data file ([1,2]SYSPARAM.DAT). STARTUP.CMD uses the data obtained to generate the correct set of commands to perform various tasks. The configuration file contains easy-to-read, functionally oriented statements so that you can make changes easily, without searching through the documentation for the proper MCR commands. For example, the following is an example of a statement in the configuration file:

```
DECNET_RMS=YES
```

This statement instructs the start-up file to install the RMS Data Access Package, which is used with DECnet for remote file access. The start-up procedure issues the following MCR command:

```
INS [1,1]DAPRES
```

5.4.1.2 **Description of the Configuration File Statements** - This section describes the syntax and function of each of the statements contained in the configuration file ([1,2]SYSPARAM.DAT). Using the descriptions in this section, you can edit the configuration file to suit your needs.

If any of the statements are omitted from the configuration file, the start-up procedure uses a default value for that statement. The default is indicated following the description of each statement.

The following are descriptions of the statements contained in the configuration file:

SYSTEM=string

This statement defines part of the text string printed by the start-up procedure. The start-up procedure prints an identification message in the following format:

```
'string' startup procedure
```

In the preceding format example, 'string' is the text following the equal sign in the statement.

Default: SYSTEM=RSX-11M-PLUS Pregenerated system

DECNET=yes/no

This statement controls whether memory space normally reserved for the DECnet Communications Executive (CEX) is deallocated, and whether [1,2]NETSTART.CMD is invoked during the start-up procedure. If you are installing DECnet on your system, you should specify DECNET=YES. If you are not installing DECnet on your system, you should specify DECNET=NO so that the memory space will be deallocated and the size of the dynamic storage region (pool) will be increased.

If you specify DECNET=YES, the Communications Executive is not deallocated and [1,2]NETSTART is invoked. See the DECnet documentation for more information on CEX and DECnet. See Section 5.6.5 for more information on the memory space reserved for CEX.

Default: DECNET=NO

DECNET_RMS=yes/no

This statement controls whether the DECnet RMS Data Access Package is installed. If you specify DECNET_RMS=YES, [1,1]DAPRES.TSK is installed when the start-up procedure is invoked. DAPRES.TSK is the resident library necessary to support transparent network file access via RMS. See the DECnet and the RMS documentation for more information on DAPRES.TSK.

Default: DECNET_RMS=NO

DAPRES=yes/no

This statement is equivalent to DECNET_RMS.

Default: DAPRES=NO

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. If you include this statement, the command file specified is invoked before the start-up procedure issues the CON ONLINE ALL command. You can use this command file to include peripheral configuration commands to dynamically alter the hardware configuration. If you do not need to include any additional configuration command, you may omit this statement, or specify CONFIGURE=NONE. See Chapter 15 of the RSX-11M/M-PLUS System Management Guide for more information on configuration commands.

Default: CONFIGURE=NONE

CON_ONLINE_ALL=yes/no

This statement controls whether the start-up 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 start-up procedure is suppressed. See Chapter 15 of the RSX-11M/M-PLUS System Management Guide for more information on the CON command.

Default: CON_ONLINE_ALL=YES

QUEUE_MANAGER=YES/NO

This statement controls whether the Queue Manager (QMG) is installed. If you specify QUEUE_MANAGER=YES, the start-up procedure installs the Queue Manager tasks and starts QMG. This statement does not control batch processors or spooled printers; see the BATCH_PROCESSORS and PRINTER statements, respectively. See Chapter 7 of the RSX-11M/M-PLUS System Management Guide for more information on setting up QMG. See the RSX-11M/M-PLUS Batch and Queue Manual for information on using queues and QMG.

Default: QUEUE_MANAGER=YES

CHECKPOINT_SPACE=n

This statement specifies, in decimal disk blocks, the size of the system checkpoint file that is allocated using the MCR ACS command.

Default: CHECKPOINT_SPACE=1024.

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 start-up procedure. See Chapter 7 of the RSX-11M/M-PLUS System Management Guide for more information on setting up batch processors. See the RSX-11M/M-PLUS Batch and Queue Manual for information on using batch processors.

Default: BATCH_PROCESSORS=1.

LONG_TEXT=yes/no

This statement, along with the COMMANDS and PARAMETERS statements, controls the messages printed by the start-up procedure. For each major step it performs, the start-up procedure prints some or all of the following types of information:

```
Step  n - description of step

          explanatory text
          parameters from configuration file
          the actual command used to perform the step
```

For example:

```
Step  4 - Allocating checkpoint space
          Allocating system controlled checkpoint space
          System checkpoint file size is 256. blocks
          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.

Default: LONG_TEXT=YES

COMMANDS=yes/no

This statement controls whether the actual command issued by the start-up procedure to perform a step is printed on the terminal. In the example given with the LONG_TEXT statement, the line reading "ACS SY:/BLKS=1024." is printed only if the configuration file contains the COMMANDS=YES statement.

Default: COMMANDS=NO

PARAMETERS=yes/no

This statement controls whether a line indicating the values specified along with each statement are printed on the terminal. In the example given with the LONG_TEXT statement, the line reading "System checkpoint file size is 256. blocks" is printed only if the configuration file contains the PARAMETERS=YES statement.

Default: PARAMETERS=YES

QUIET=yes/no

This statement is a combination of the LONG_TEXT, COMMANDS, and PARAMETERS statements. If you specify QUIET=NO, the start-up procedure acts as if you had specified YES to the LONG_TEXT, COMMANDS, and PARAMETERS statements. If you specify QUIET=YES, the start-up procedure acts as if you had specified NO to all three statements. The QUIET statement is provided as an equivalent of the .ENABLE QUIET directive in the Indirect Command Procedure.

To avoid possible confusion, you should not include the QUIET statement in the configuration file if that file contains any or all of the LONG_TEXT, COMMANDS, 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.

Default: There is no default for this statement.

START_FILE=filename

This statement specifies a command file to be used as a secondary start-up command file. If you include this statement, the command file specified is invoked as a nested indirect command file, after the start-up procedure has completed its normal steps. You can use this secondary command file to perform additional start-up functions. If you do not wish to perform any additional start-up functions, you may omit this statement, or specify START_FILE=NONE. See the RSX-11M/M-PLUS MCR Operations Manual for more information on using the Indirect Command Procedure.

Default: START_FILE=NONE

DRIVER=dd:

This statement is used to load auxiliary I/O drivers. For example, if you specify DRIVER=DU: in the configuration file, the DU: device driver is loaded before the start-up procedure brings all devices online with the CON ONLINE ALL command. You may include this statement in the configuration file as many times as necessary to load the drivers you desire. Each statement causes the start-up procedure to load a single auxiliary driver. See Section 5.5.2.2 for a list of the DIGITAL-supplied device drivers on the pregenerated kit. You may also use this statement to load a user-supplied device driver.

Default: No auxiliary drivers are loaded.

TERMINAL=ddnn,type,speed,upper/lower

This statement is used to set terminal characteristics. One TERMINAL statement must be included in the configuration file for each terminal in your system. For each terminal, several options must be specified.

The first option (ddnn:) is the terminal number (for example, TT3). The second option (type) is the terminal type (for example, VT100). You may specify any terminal type that is accepted by the MCR SET /TERMINAL command. (See the SET command in RSX-11M/M-PLUS MCR Operations Manual for a complete list of supported terminals.) The third option (speed) is the transmit/receive speed (for example, 9600) for the terminal if it is interfaced through a variable-speed multiplexer (DZ11 or DZV11), or FIXED if it is not. The fourth option (upper/lower) is LOWER for terminals that support lowercase characters, or NOLOWER for terminals that do not support lowercase characters.

There may be any number of TERMINAL statements in the configuration file. Each TERMINAL statement sets the characteristics for one terminal.

Default: TERMINAL=TT0,LA120,FIXED,LOWER

SET_OPTIONS=ddnn,/switch1/switch2 ... /switchn

This statement is used to set terminal characteristics not included in the TERMINAL statement (for example, whether the terminal supports form feeds). One corresponding TERMINAL statement must be included in the configuration file for each SET_OPTIONS statement. You may specify any number of switches for each SET_OPTIONS statement.

The first option (ddnn) is a terminal number corresponding to a TERMINAL statement already included in the configuration file. The second and subsequent options (/switch1/switch2 .../switchn) may be any switch that may be used with the MCR SET command. For the second and each subsequent option, the start-up procedure issues an MCR SET command. For example:

```
SET=TT5,/FORMFEED/SLAVE
```

Including the above statement in the configuration file causes the start-up procedure to issue the following MCR commands:

```
SET /FORMFEED=TT5:
SET /SLAVE=TT5:
```

You may include any number of SET statements in the configuration file. Each SET_OPTIONS statement sets additional characteristics for one terminal. See the RSX-11M/M-PLUS MCR Operations Manual for a complete list of switches for the MCR SET command.

Default: No SET statements are provided.

PRINTER=ddnn,form,flag

This statement specifies spooled printer characteristics. For each printer in your system, one PRINTER statement must be included in the configuration file. You must specify several options for each PRINTER statement.

The first option (ddnn) is the device name of the printer (for example, TT5 or LP0). The second option (form) is the form type, specified in the format FORM:n. The third option (flag) is the number of flag pages, specified in the format FLAG:n. The start-up 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.

The following is an example of a typical PRINTER statement:

```
PRINTER=LP0,FORM:0,FLAG:1
```

Default: No spooled printers are established.

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 start-up procedure as this statement is processed.

If you include this statement, the start-up 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.

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 start-up 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 start-up 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 start-up 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.

CLI=cliname

This statement specifies which Command Language Interpreter (CLI) is to be used when the start-up procedure nests to another command file for the START_FILE and APPLICATION statements. You

may specify only MCR or DCL as options for this statement. Note that all of the commands in the start-up procedure (STARTUP.CMD and subsidiary files) are sent to MCR, regardless of the option you specify for this statement.

Default: CLI=MCR

LOGOUT=yes/no

This statement specifies whether the start-up procedure logs off the console terminal after it finishes.

Default: LOGOUT=NO

ERROR_LOG=yes/no

This statement specifies whether the start-up procedure starts the Error Logger. Note that if you specify COMMANDS=NO, no messages are displayed when error logging is started, regardless of whether the Error Logger has been successfully started. See the RSX-11M/M-PLUS Error Logging Manual for information on using the Error Logger.

Default: ERROR_LOG=YES

The following is a list of the statements contained in the configuration file ([1,2]SYSPARAM.DAT) that is supplied on your kit disk:

```
SYSTEM=RSX-11M-PLUS PREGEN
DECNET=NO
DAPRES=NO
CONFIGURE=NONE
CON_ONLINE_ALL=YES
CHECKPOINT_SPACE=1024.
QUEUE_MANAGER=YES
BATCH_PROCESSORS=1.
LONG_TEXT=NO
COMMANDS=NO
PARAMETERS=YES
ERROR_LOG=YES
STARTFILE=NONE
TERMINAL=TT0,LA120,Fixed,NOLOWER
;DRIVER=LP:
;PRINTER=LP0,FORM:0,FLAG:1
;TERMINAL=TT1,LA50,Fixed,NOLOWER
;SET=TT1,/FORMFEED
;PRINTER=TT1,FORM:0,FLAG:1
CLI=MCR
LOGOUT=NO
```

The statements preceded by a semicolon (;) are ignored by the system start-up procedure. You can edit the configuration file to remove the semicolons and activate these statements.

5.4.1.2.1 **Start-Up Procedure Error Messages** - If while it is reading the configuration file READCON.CMD encounters an error in a statement included in the configuration file, the start-up 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 configuration option.
           The illegal option was:

           [text of the erroneous statement]

           This option specification 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 default values are assumed.

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

UIC:           [200,1]
Account name:  USER
Password:      USER
```

You should change the passwords to these accounts as the first step in setting up an account file, to preserve the security of your system.

The [200,1] account is supplied for use in conjunction with the warm-up session presented in the Introduction to RSX-11M and RSX-11M-PLUS. See that manual for more information.

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 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 UFD [1,2] on your system disk. See the RSX-11M/M-PLUS MCR Operations Manual for a description of the HELP command and the help file format.

In UFD [200,1] on your system disk are introductory files used with the warm-up session for new users presented in the Introduction to RSX-11M and RSX-11M-PLUS manual. 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 to follow along with the warm-up session.

UFD [200,1] 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).

5.4.5 Installing the RMS-11 Tasks, Utilities, and Libraries

RMS-11 V2.0 is included on the pregenerated kit disk. The RMS segmented library (RMSRES, and RMSLBA through RMSLBF) and all of the RMS 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 remote access facilities. See Section 5.4.1 for information on installing the RMS remote access package (DAPRES),

For more information on RMS-11, see the RSX-11M-PLUS/RMS-11 Release Notes and RMS-11: An Introduction.

5.4.6 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 [1,2]SYSVMR.CMD 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 UFD [3,54] on the kit disk.

When you use the DELETESYS.CMD 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 "xxxFSL.TSK" are deleted; when you delete the [2,54] system, the tasks of the form "xxxRES.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 functionality.

5.4.7 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.

5.4.8 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 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 rebootstrapping the system (or, if the data base was loaded using VMR, without recreating the system image with VMR).

All the device drivers supplied have been built to load in 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 LOA command 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 auxilary driver, the system start-up 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

This chapter tells you how to prepare your pregenerated system for use. Once you have done that, you will need other information on operating and adjusting your system.

If you are not already familiar with RSX-11M-PLUS, you should read the Introduction to RSX-11M and 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 that you 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
- ICB pool size = 128(decimal) words
- DECnet
- Resource Accounting
- QMG and batch processor
- FCP = FCPLRG
- File windows in secondary pool
- Default virtual terminal unit buffer size = 120(decimal)
- Maximum virtual terminal unit buffer size = 184(decimal)
- Unsolicted input time-out = 30(decimal) seconds
- Crash notification device CSR address = 177564
- Crash device and unit number = DL1:
- Memory size = 256(decimal) K words
- Floating point processor
- System clock is not programmable

Note that the crash device can be changed dynamically in the pregenerated system using the MCR SET /CRASH_DEVICE command. See Section 5.6.2.

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
- Software Performance Monitor (SPM-11)
- Shadow recording
- Console logging
- Executive Debugging Tool (XDT)

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
CO Console 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 in the pregenerated systems:

DD TU58 driver
DY RX02 driver
DU RA60, RA80, RA81, RX50/RD51 driver
IP IP-11 driver
MS TSV05, TS11, TU80 driver
LP Line printer driver
LA LPA11-K driver

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 start-up procedure. See Section 5.4.1 for information on using the start-up procedure to load drivers. See also Section 5.4.8 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 start-up procedure.

The autoconfiguration task finds all the terminal interfaces connected to your processor (DL11/DLV11 and DZ11/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 start-up 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 **Tasks Supplied** - The system disk contains the standard complement of privileged system tasks.

Many of the nonprivileged system tasks are supplied in "xxxFSL.TSK" and "xxxRES.TSK" versions. These tasks reside in UFD [3,54] on the kit disk.

When you use the DELETESYS.CMD 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 "xxxFSL.TSK" are deleted; when you delete the [2,54] system, the tasks of the form "xxxRES.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 functionality.

5.5.2.4 **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 (PDP-11/70 and PDP-11/44). This system resides in UFD [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 (MICRO/PDP-11, PDP-11/23-PLUS, PDP-11/24). This system resides in UFD [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.

- 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, software correction or logging of memory parity errors, or XDT.

- The User Environment Test Package (UETP) is not included on the kit disk. The start-up procedure verifies that the system is working properly and prints a confirmation message each time the system is bootstrapped.

- 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.

- Since 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	1	4
DU	1	4
DY	1	2
IP	2	1
LA	1	1
LP	1	1
MS	1	1

Many of the nonprivileged system tasks are supplied in xxxFSL.TSK and xxxRES.TSK versions. These tasks reside in UFD [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 that you never use. These unused files may be deleted from the system disk in order to make more disk space available for your tasks and applications. Should you at some point in the future have a need for tasks you have deleted, you can copy them from the original kit disk.

5.6.2 Changing the Crash Dump Device

You can change the system crash device using the MCR and VMR SET /CRASH_DEVICE commands.

Both the [1,54] and [2,54] systems are supplied with the crash device set to DL1:. If you copy the RL02 kit disk to a DU-type system disk, though, when you create a new system image file using DUVMR.CMD, the crash device is set to DU0:.

If the current system crash device is not included in your system, or if the crash device is the device on which you are running the pregenerated system, you should change the system crash device.

The following is an example of using the MCR SET /CRASH_DEVICE command to check the current crash device in a running system:

```
>SET /CRASH_DEVICE (RET)
CRASH_DEVICE=DU0:
```

In the example, the response printed by the system indicates that the current crash device is DU0:.

You can use the MCR SET /CRASH_DEVICE command to 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 start-up command file so that it will be issued each time the system is started.

If you wish to change the crash device permanently, you must use the VMR SET /CRASH_DEVICE command to change the system image file. The following is an example of using VMR to change the system crash device to DU1: in the [1,54] system image file:

```
>SET /UIC=[1,54] (RET)
>ASN LB:=SY: (RET)
>VMR (RET)
Enter filename: RSX11M.SYS (RET)
VMR>SET /CRASH_DEVICE=DU1: (RET)
VMR>SET /CRASH_DEVICE (RET)
VMR>CRASH_DEVICE=DU1:
VMR> (CTRL/Z)
```

NOTE

Both the VMR and MCR SET /CRASH_DEVICE commands allow you to specify only DL- and DU-type devices as the system crash device. Both commands will not allow you to make the current system device the crash device.

5.6.3 Loading 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 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 rebootstrapping the system (or, if the data base was loaded using VMR, without recreating the system image with VMR).

All the device drivers supplied have been built to load in 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 LOA command to load additional drivers, the system returns the "Partition DRVPAR too small" error message.

When you use the DRIVERS statement in the configuration file to load an auxilary driver, the system start-up 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
```

For more information on incorporating loadable drivers into RSX-11M-PLUS, see the RSX-11M-PLUS Guide to Writing an I/O Driver.

5.6.4 K-Series Laboratory Peripherals and LPA11-K Controller

To enable you to generate K-Series support routines, UFD [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 UFD[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.

5.6.5 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. The start-up configuration file supplied with the kit disk includes the statement DECNET=NO, which deallocates the memory space that would have been used by CEX.

If you intend to install DECnet on your system, you must edit the start-up configuration file and change the DECNET statement to read DECNET=YES. See Section 5.4.1 for more information on the system start-up procedure and the DECNET statement.

5.6.6 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, 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="11/23-PLUS
```

Use an editor to change the line to read:

```
R$$TPR="11/24
```

APPENDIX A

CONFIGURATION WORKSHEETS

During the Choosing Executive Options and Choosing Peripheral Configuration 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 UFD [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 require 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.

E X E C U T I V E A N D P R O C E S S O R O P T I O N S

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

(Worksheet continues on Page 2)

E X E C U T I V E A N D P R O C E S S O R O P T I O N S

System: _____

Author: _____

Date: ____ – ______ – ____

Supervisor-mode library support:	Yes	No	
FCS resident library support:	Yes	No	
Loadable drivers/data bases:	Yes	No	
ICB pool size:	_____		(decimal words)
Communications products support:	Yes	No	
SPM-11 support:	Yes	No	
System name:	_____		(up to 6 chars)
Shadow recording 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	
FCP type:	FCPLRG	FCPMDL	
File windows in secondary pool:	Yes	No	
Virtual terminal support:	Yes	No	
Default virtual terminal unit buffer size:	_____		
Maximum virtual terminal unit buffer size:	_____		

(Worksheet continues on Page 3)

E X E C U T I V E A N D P R O C E S S O R O P T I O N S

System: ----------

Author: ----------

Date: ____ – ______ – ____

Unsolicited terminal input time-out: ----------

Executive Debugging Tool (XDT) support: Yes No

Crash notification device CSR address: ----------

Crash device mnemonic: ----------

Crash device physical unit number: ----------

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

M A S S B U S C O N T R O L L E R C O N F I G U R A T I O N

System: _____

Author: _____

Date: ____ – ______ – ____

Mixed MASSBUS: Yes No

Name	Device Type	---Configuration--- Vector	CSR
RHA	_____	_____	_____
RHB	_____	_____	_____
RHC	_____	_____	_____
RHD	_____	_____	_____

Example:

RHC	DB	254	176700

M A S S B U S D R I V E C O N F I G U R A T I O N

List devices in this order:
DB: RP04/05/06 disk
DR: RM02/03/05/80/RP07 disk
DS: RS03/04 disk
EM: ML11 disk
MM: TU16/45/77/TE16 magtape

System: _____

Author: _____

Date: ____ _ ______ _ ____

Sheet: ____ of ____

Drive Name	Drive Type	Physical Unit No.	Controller Connections Port A	Port B

Example:

DB3:	RP06	2	RHD	---

U N I B U S C O N T R O L L E R C O N F I G U R A T I O N

System: _____

Author: _____

Date: ____ - ______ - ____

Sheet: ____ of ____

---Controller Information---			--Configuration Information--	
Logical Name	Type	Drives (lines)	Vector	CSR
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------
-------	------	--------	------	----------

Example:

DKA	RK11	3	220	177404
-------	------	--------	------	----------

U N I B U S D R I V E C O N F I G U R A T I O N

List drive units for multiple drive UNIBUS devices.

System: _____

Author: _____

Date: ____ - _____ - ____

Sheet: ____ of ____

Drive Name	Drive Type	Physical Unit No.	--Controller Connections-- Port A	Port B
DK0:	RK05	0	DKB	---

Example:

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)

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	RX50 RD51	Floppy disk Disk
		UDA50	RC25 RA60 RA80 RA81	Disk
DX	DX	RX11	RX01	Floppy disk
DY	DY	RX211	RX02	Floppy disk
EM	RH	RH11/RH70	ML11	Semiconductor disk emulator
IP	IP	IP11		Industrial control system
LA	LA	LPA11		Lab peripheral accelerator
LP	LP	LA180 LN01 LP11 LS11 LV11	LA180 LN01 LP01 LP02 LP04 LP05 LP06 LP07 LP14 LP25 LP26 LP27 LS11 LV01	Printer
LR	LR	PCL11		Parallel communications link (receiver)
LT	LT	PCL11		Parallel communications link (transmitter)

(continued on next page)

Table B-1 (Cont.)
RSX-11M-PLUS Devices

Device Mnemonic	Controller Mnemonic	Controller Name	Device Type	Device Description
MM	RH	RH11/RH70 (with TM02/TM03 formatter)	TU16 TE16 TU45 TU77	Magnetic tape
MS	MS		TS11 TU80 TSV05	Magnetic tape
MT	MT	TM11/TMA11/TMB11	TE10 TU10 TU10W TS03	Magnetic tape
PP	PP	PC11		Paper tape reader and punch
PR	PR	PR11		Paper tape reader
TT	YL YH YJ YZ	DL11/DLV11 DH11/DHV11 DJ11 DZ11/DZV11		Terminal
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. This information is not necessary to perform a system generation but 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 help you to optimize your system's operation following 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 computer system resources while maintaining a priority scheduling discipline.

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 of 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.

NOTE

These parameters are set by commands in the SYSVMR command file and can be changed by using the MCR SET or VMR SET command.

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 one 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:

1. 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.

2. 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.

3. Input is a factor in determining when checkpointing will occur. Editors and other interactive tasks normally should run at a higher priority than more compute-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 the course of 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 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.

Since 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 rebootstrapped.

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 a task called PMT that monitors pool 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 F11ACP. See the RSX-11M/M-PLUS Command Language Manual for information on the commands used to mount volumes with separate F11ACPs.

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 of seek time. 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. In the case of 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 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 three. 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 SAV command 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 ACS command 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.

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 of the 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 Example 1.

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

```
>>>B MS


RSX-11M/RSX-11M-PLUS Standalone Copy System V02


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


Enter first device: /DEV

Device      CSR     Vector   CSR Status
------     ------   ------   ----------
DB         176700    254     Present
DK         177404    220     Not Present
DL         174400    160     Present
DM         177440    210     Present
DP         176714    300     Present
DR         176300    150     Not Present
DU         172150    154     Not Present
MF FOR=0   175400    260     Not Present
MM FOR=0   172440    224     Not Present
MS         172522    330     Present
MT         172522    320     Present


Enter first device: MS0:/VEC=224

Enter second device: DM0:

Hit RETURN and enter date and time as 'TIM HH:MM MM/DD/YY'

>TIM 11:20 4/19/83
>TIM
11:20:05 19-APR-83
>
>RUN BAD
>
BAD>DM0:/LIST
BAD -- DM0: Total bad blocks= 0.
BAD>^Z
>
>RUN BRU
>
BRU>/DENSITY:1600/VERIFY/MAX:10567/HEADERS:1654
From:   MS0:
To:     DM0:
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>^Z


^P
CONSOLE
>>>H
17777707 001340
>>>B DM



RSX-11M-PLUS V2.1  BL15   384.KW  System:"Baseline"
>RED DM:=SY:
>RED DM:=LB:
>RED DM:=SP:
>MOU DM:"RSX11MPBL15"
>@[2,54]BASTART
>;
>;      RSX-11M-PLUS V2.1 Distribution Kit
>;
>;      This is the baseline system of the RSX-11M-PLUS V2.1
>;      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]: 19-APR-83 11:40
>TIME 19-APR-83 11:40
>;
>;      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
>;
>;      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:
>;
```

```
>;      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.
>;
>CON SET RHC CSR=160000
>CON SET MTA CSR=160000
>CON SET MSA CSR=172522
>CON SET MSA VEC=224
>;
>;      We will now bring online 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]:
>;
>CON ONLINE ALL
>;
>;      Prepare to bring in the remainder of the distribution kit
>;
>* Is your target system disk an RK07? [Y/N]: Y
>;
>;      The RK07 pack onto which you have just loaded your RSX-11M-PLUS V2.1
>;      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 RK07 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 an RK07 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 RK07 to receive the sources [S]: DM1:
>;
>;      We will now mount the RK07 pack that will receive the sources.
>;
>MOU DM1:/FOR
>;
>;      The pack in DM1: 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 DM1:? [Y/N]:
>;
```

```
>* Do you wish to run the Bad Block Locator on DM1:? [Y/N]: Y
>;
>INS $BAD
>BAD DM1:/LIST
BAD -- DM1: Bad block found - LBN= 19669.
BAD -- DM1: Bad block found - LBN= 32170.
BAD -- DM1: Bad block found - LBN= 47796.
BAD -- DM1: Bad block found - LBN= 52353.
BAD -- DM1: Bad block found - LBN= 52634.
BAD -- DM1: Total bad blocks= 5.
>;
>;      We will now mount the tape in MS0: for access by BRU.
>;
>MOU MS0:/FOR/DENS=1600
>;
>;      Ensure that the BRU task is installed.
>;
>INS $BRU
>;
>;      We will now load the remainder of the distribution kit.
>;
>TIME
11:46:46 19-APR-83
>;
>BRU /BAC:MPLUSBL15SRC/NOPRES/INI/HEADER:1654/DENS:1600 MS0: DM1:
BRU - Starting Tape 1 on MS0:

BRU - This disk will not contain a hardware bootable system

BRU - End of Tape 1 on MS0:

BRU - Completed

>;
>DMO MS0:/LOCK=H
11:55:40  *** MS0:  -- Dismount complete
DMO -- TT0:    dismounted from MS0:    *** Final dismount initiated ***
>;
>TIME
11:55:41 19-APR-83
>DMO DM1:/LOCK=S
11:55:41  *** DM1:  -- Dismount complete
DMO -- TT0:    dismounted from DM1:    *** Final dismount initiated ***
>MOU DM1:/OVR
>;
>;      We will now copy the help files from the second RK07 to the target
>;      system disk.
>;
>SET /UIC=[1,2]
>PIP SY:[1,2]/CD=DM1:[1,2]
>;
>;      We will now create any UFDs that must be created on your disk(s).
>;      You will not see the UFD commands.
>;
>TIME
11:58:10 19-APR-83
>;
>;
>;      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 online, or proceed with the normal startup sequence if the
>;      baseline system was used.
>;
```

TWO SYSTEM GENERATION EXAMPLES

```
>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.
>;
>;       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 Management 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
>;                               Management 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
>;
>ELI /LOG/LIM
11:58:39  ERRLOG -- Error Logging initialized
>CLI /INIT=DCL
>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 $QMGPRT/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>
>
>
>@SYSGEN
>;
>; RSX-11M-PLUS  SYSGEN  BL15
>;
>; COPYRIGHT (C)  1983
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>;
>TIM
12:00:12 19-APR-83
>;
>; 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.
>;
>; 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]:
>;
>; 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]:
>;
>* SU040   Do you want to use a saved answer file as input for
>*         the peripheral configuration? [Y/N D:N]:
>;
>* SU060   Do you want to use a saved answer file as input for
>*         the nonprivileged task builds? [Y/N D:N]:
>;
>* SU080   Do you want to do a PREPGEN? [Y/N D:N]: Y
>;
>!INS LB:[3,54]MAC/INC=20000
>!INS LB:[3,54]LBR/INC=20000
>!INS LB:[3,54]TKB/INC=20000
>!INS LB:[3,54]VMR
>;
```

```
>* SU090   Enter the name of the disk drive containing your
>*         target system disk [ddnn:] [S R:2-5]: DM0:
>;
>ASN DM0:=IN:
>ASN DM0:=OU:
>ASN DM0:=SY:
>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]: Y
>;
>; 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
DDB      310      176510
LPA      200      177514
YLA      060      177560
YZA      330      160110

>ACO SYSGEN
>;
>* SU110   Do you want to override the Autoconfigure results? [Y/N D:N]:
>;
>; You can:
>;
>;    o  do a complete SYSGEN
>;
>;    o  continue a previous SYSGEN from where you left off
>;
>;    o  do an individual section of SYSGEN
>;
>;
```

```
>* SU120   Do you want to do a complete SYSGEN? [Y/N D:Y]:
>;
>;
>;
>;=====================================================
>;  Choosing Executive Options      19-APR-83 at 12:01
>;=====================================================
>;
>;
>;
>; 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 RSX-11M-PLUS V2.1 System Generatic
>* Comment [S R:0.-55.]: and Installation Guide
>* Comment [S R:0.-55.]:
>;
>* CE020   Do you want the Full-functionality Executive? [Y/N D:Y]:
>;
>* CE120   Do you want support for communications products
>*         (such as DECnet)? [Y/N D:N]:
>;
>* CE124   Do you want SPM-11 support? [Y/N D:N]:
>;
>* CE130   What is the system name? [S R:0-6 D:"RSXMPL"]: EXMPL1
>;
>* CE270   Do you want to include XDT? [Y/N D:N]: Y
>;
>* CE280   Enter the crash notification device CSR
>*         address [O R:160000-177700 D:177564]:
>;
>* CE290   On what device do you wish crash dumps to be written? [S R:2-3]: DI
>;
>* CE300   What is the physical unit number of the crash unit? [O R:0-7 D:0]:
>;
>* CE330   Is your system clock programmable (KW11-P)? [Y/N D:N]:
>;
>* CE350   Is your line frequency 50 Hz? [Y/N D:N]:
>;
>;
>;
>;============================================================
>;  Choosing Peripheral Configuration      19-APR-83 at 12:02
>;============================================================
>;
>;
>;
>; 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 RSX-11M-PLUS V2.1 System Generatic
>* Comment [S R:0.-55.]: and Installation Guide
>* Comment [S R:0.-55.]:
>;
>;
```

```
>;   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? [O D:0]:
>;
>;
>;   MS:    controllers: TS11, TU80, TSV05
>;
>;
>;   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.]:
>;
>* CP5480  Enter line printer type for LPA [S R:4-5 D:"LP25"]:
>;
>* CP5484  Does LPA have lowercase characters? [Y/N D:N]: Y
>;
>;
>;   LA:    controller:  LPA11
>;
```

```
>* CP6204  How many LPA11 lab subsystems do you have? [D R:0.-16. D:0.]:
>;
>;
>;   IP:    controller:  IP11
>;
>* CP6404  How many IP11 industrial control subsystems do you have? [O D:0]:
>;
>;
>;   TT:    controllers: DL11, DLV11    controller mnemonic: YL
>;
>* CP6832  Enter terminal type for YLA [S R:4-6 D:"LA120"]:
>;
>;
>;   TT:    controller:  DJ11           controller mnemonic: YJ
>;
>* CP7204  Enter number of DJ11 asynchronous line
>*         multiplexers [D R:0.-16. D:0.]:
>;
>;
>;   TT:    controllers: DZ11, DZV11    controller mnemonic: YZ
>;
>* CP7420  Do any of the DZ11/DZV11 lines require modem support? [Y/N D:N]:
>;
>* CP7484  Enter terminal type for YZA [S R:4-6 D:"VT100"]:
>;
>;
>* CP7604  Do you have any intercomputer communication devices? [Y/N D:N]:
>;
>;
>; 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]:
>;
>;
>; 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
>;
>;
>;
>;================================================================
>;  Assembling the Executive and Drivers      19-APR-83 at 12:09
>;================================================================
>;
>;
>;
>; 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]:
>;
>!ASN NL:=LS:
>;
>;
>* AE030   Do you wish to pause to edit any files before
>*         assembling? [Y/N D:N]:
>;
>!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.:2112.:256.=[11,24]RSX11M.OBS
>;
>!LBR TTDRV/CR:40.:392.:128.=[11,24]TTDRV.OBS
>;
>;
>;
>;============================================================
>;  Building the Executive and Drivers      19-APR-83 at 12:09
>;============================================================
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>!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]:
>;
>!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
>;
>!TIME
>;
>!TKB @RSXBLD
>;
>!TIME
>;
>!TKB @[200,200]DRIVERS.BLD
>;
>!TIME
>;
>;
>;
>;============================================================
>;  Building the Privileged Tasks      19-APR-83 at 12:10
>;============================================================
>;
>;
>;
>; 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]:
>;
>!ASN NL:=MP:
>;
>!SET /UIC=[1,24]
>;
>!TIME
>;
>!TKB @ACCFSLBLD
>!TKB @ACNFSLBLD
>!TKB @ACSFSLBLD
>!TKB @BOOBLD
>!TKB @BPRBLD
>!TKB @BROBLD
>!TKB @BYEBLD
>!TKB @COTFSLBLD
>!TKB @DMOBLD
>!TKB @ELIFSLBLD
>!TKB @ERLBLD
>!TKB @FCPLRGBLD
>!TKB @FXRBLD
>!TKB @F11MSGBLD
>!TKB @HELFSLBLD
>!TKB @HRCBLD
>!TKB @INIBLD
>!TKB @INSBLD
>!TKB @LOABLD
>!TKB @LPPFSLBLD
>!TKB @MCRBLD
>!TKB @MCDBLD
>!TKB @MOUBLD
>!TKB @MTABLD
>!TKB @PMDFSLBLD
>!TKB @PMTBLD
>!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      19-APR-83 at 12:10
>;============================================================
>;
>;
>;
>; 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]:
>;
>;
>;
>;============================================================
>;  Creating the System Image File      19-APR-83 at 12:10
>;============================================================
>;
>;
>!SET /UIC=[1,54]
>;
>!PIP OU:RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK
>;
>!ASN LB:=SY:
>!VMR @SYSVMR
>;
>; End of SYSGEN
>;
>TIME
12:10:35 19-APR-83
>;
>ASN =
>;
>@ <EOF>
>
>
>
>
>@SYSGEN
>;
>; RSX-11M-PLUS  SYSGEN  BL15
>;
>; COPYRIGHT (C)  1983
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>;
>TIM
12:11:06 19-APR-83
>;
>; 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.
>;
```

```
>; 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]:
>;
>; 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
>;
>* SU030   Enter saved answer file name [S D:"SYSGENSA1.CMD"]:
>;
>* SU040   Do you want to use a saved answer file as input for
>*         the peripheral configuration? [Y/N D:N]: Y
>;
>* SU050   Enter saved answer file name [S D:"SYSGENSA2.CMD"]:
>;
>* SU060   Do you want to use a saved answer file as input for
>*         the nonprivileged task builds? [Y/N D:N]: Y
>;
>* SU070   Enter saved answer file name [S D:"SYSGENSA3.CMD"]:
>;
>* SU080   Do you want to do a PREPGEN? [Y/N D:N]:
>;
>INS LB:[3,54]MAC/INC=20000
>INS LB:[3,54]LBR/INC=20000
>INS LB:[3,54]TKB/INC=20000
>INS LB:[3,54]VMR
>;
>* SU090   Enter the name of the disk drive containing your
>*         target system disk [ddnn:] [S R:2-5]: DM0:
>;
>ASN DM0:=IN:
>ASN DM0:=OU:
>ASN DM0:=SY:
>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]:
>;
```

```
>; You can:
>;
>;    o  do a complete SYSGEN
>;
>;    o  continue a previous SYSGEN from where you left off
>;
>;    o  do an individual section of SYSGEN
>;
>;
>* SU120   Do you want to do a complete SYSGEN? [Y/N D:Y]:
>;
>;
>;
>;=====================================================
>;  Choosing Executive Options      19-APR-83 at 12:11
>;=====================================================
>;
>;
>; Using saved answer file DM0:[200,200]SYSGENSA1.CMD;1
>; created on 19-APR-83 at 12:01:15.
>;
>; Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>; and Installation Guide
>;
>;
>;
>;
>;=============================================================
>;  Choosing Peripheral Configuration      19-APR-83 at 12:12
>;=============================================================
>;
>;
>; Using saved answer file DM0:[200,200]SYSGENSA2.CMD;1
>; created on 19-APR-83 at 12:03:02.
>;
>; Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>; and Installation Guide
>;
>;
>;
>;   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
>;
>;
>;   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, DZV11    controller mnemonic: YZ
>;
>;
>;
>;================================================================
>;  Assembling the Executive and Drivers      19-APR-83 at 12:17
>;================================================================
>;
>;
>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
12:18:09 19-APR-83
>;
>MAC @RSXASM
>;
>TIME
12:39:08 19-APR-83
>;
>MAC @DRIVERS.ASM
>;
```

```
>TIME
12:52:29 19-APR-83
>;
>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.:2112.:256.=[11,24]RSX11M.OBS
>;
>LBR TTDRV/CR:40.:392.:128.=[11,24]TTDRV.OBS
>SET /UIC=[200,200]
>;
>;
>;
>;============================================================
>;  Building the Executive and Drivers      19-APR-83 at 12:57
>;============================================================
>;
>;
>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
>;
>TIME
13:01:59 19-APR-83
>;
>TKB @RSXBLD
>;
>TIME
13:12:34 19-APR-83
>;
>TKB @[200,200]DRIVERS.BLD
>;
>TIME
13:18:57 19-APR-83
>SET /UIC=[200,200]
>;
>;
>;
>;=========================================================
>;  Building the Privileged Tasks      19-APR-83 at 13:18
>;=========================================================
>;
>;
>;
>ASN NL:=MP:
>;
>SET /UIC=[1,24]
>;
```

```
>TIME
13:19:02 19-APR-83
>;
>TKB @ACCFSLBLD
>TKB @ACNFSLBLD
>TKB @ACSFSLBLD
>TKB @BOOBLD
>TKB @BPRBLD
>TKB @BROBLD
>TKB @BYEBLD
>TKB @COTFSLBLD
>TKB @DMOBLD
>TKB @ELIFSLBLD
>TKB @ERLBLD
>TKB @FCPLRGBLD
>TKB @FXRBLD
>TKB @F11MSGBLD
>TKB @HELFSLBLD
>TKB @HRCBLD
>TKB @INIBLD
>TKB @INSBLD
>TKB @LOABLD
>TKB @LPPFSLBLD
>TKB @MCRBLD
>TKB @MCDBLD
>TKB @MOUBLD
>TKB @MTABLD
>TKB @PMDFSLBLD
>TKB @PMTBLD
>TKB @QMGFSLBLD
>TKB @RMDBLD
>TKB @SAVBLD
>TKB @SHABLD
>TKB @SHFBLD
>TKB @SHUBLD
>TKB @SYLFSLBLD
>TKB @TKNBLD
>TKB @UFDBLD
>TKB @UNLFSLBLD
>;
>TIME
14:07:51 19-APR-83
>;
>ASN LB:=OU:
>SET /UIC=[200,200]
>;
>;
>;
>;============================================================
>;  Building the Nonprivileged Tasks      19-APR-83 at 14:07
>;============================================================
>;
>;
>; Using saved answer file DM0:[200,200]SYSGENSA3.CMD;1
>; created on 19-APR-83 at 12:10:20.
>;
>;
>;
>;
>;============================================================
>;  Creating the System Image File      19-APR-83 at 14:07
>;============================================================
>;
>;
```

```
>SET /UIC=[1,54]
>;
>PIP OU: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*-Installed tasks or commons may no longer fit in partition
SET /TOP=DRVPAR:-*
SECPOL 117734 00174200 00100000  SEC POOL
SYSPAR 117670 00274200 00102500  MAIN
       117624 00274200 00035500  RO COM !DIR11M!
       117540 00331700 00004100  TASK    [...LDR]
       116624 00336000 00026200  TASK    [MCR...]
       116424 00364200 00007400  TASK    [TKTN  ]
       116224 00373600 00003100  TASK    [SHF...]
DRVPAR 116144 00376700 00073300  MAIN
       116100 00376700 00017600  RO COM !TTCOM !
       116014 00416500 00020000  DRIVER (TT:)
       115540 00436500 00005300  DRIVER (DR:)
       115160 00444000 00005200  DRIVER (DM:)
       114570 00451200 00003100  DRIVER (DL:)
       114260 00454300 00004300  DRIVER (MS:)
       113554 00460600 00004000  DRIVER (DD:)
       113334 00464600 00001100  DRIVER (LP:)
       113144 00465700 00000100  DRIVER (NL:)
       113100 00466000 00000300  DRIVER (CO:)
       113034 00466300 00002400  DRIVER (VT:)
       112770 00470700 00001300  DRIVER (RD:)
GEN    112724 00472200 02305600  MAIN
...LDR 11.05  117400  SYSPAR 248. 00004100 LB0:-00116713 FIXED
TKTN   06.00  116470  SYSPAR 248. 00007400 LB0:-00121714 FIXED
F11MSG 13.00  110654  GEN    200. 00006100 LB0:-00117726
MTAACP 14.00  110274  GEN    200. 00015100 LB0:-00121355
SHE... 03.00  110030  GEN    200. 00014000 LB0:-00120657
MCR... 5.00   117074  SYSPAR 160. 00026200 LB0:-00120363 FIXED
F11ACP 05.00  112514  GEN    149. 00014200 LB0:-00117651
ERRLOG 2.00   112164  GEN    148. 00042500 LB0:-00117602
PMT... 2.00   111524  GEN    148. 00006700 LB0:-00120534
COT... 01.02  111000  GEN    145. 00013000 LB0:-00117512
HRC... 02     110414  GEN    140. 00056200 LB0:-00120141
PMD... 06.00  110150  GEN    140. 00017000 LB0:-00120630
SYSLOG 1.03   111254  GEN    130. 00020100 LB0:-00121672
SHF... 6.00   116270  SYSPAR 105. 00003100 LB0:-00120551 FIXED
FXR... 02.00  110534  GEN    100. 00003200 LB0:-00117721
BAP0   04.00  112304  GEN     80. 00046600 LB0:-00117751
QMG... 03.00  111400  GEN     75. 00033000 LB0:-00121160
LP0    03.00  111740  GEN     70. 00013600 LB0:-00120712
ACNT   05.00  111130  GEN     50. 00040300 LB0:-00117334
SHUTUP 03.00  107710  GEN     50. 00012000 LB0:-00120675
...RMD 2.00   001774+ GEN    225. 00030200 LB0:-00121504
...DCL 2.0    001750+ GEN    160. 00040500 LB0:-00011370
...DMO 04.00  001752+ GEN    160. 00016200 LB0:-00117541
...MCR 3.00   001766+ GEN    160. 00040200 LB0:-00120757
...MOU 26.00  001770+ GEN    160. 00040300 LB0:-00120415
...CA. 11     002020+ GEN    150. 00022300 LB0:-00022160
...INS 14.00  001764+ GEN    100. 00043700 LB0:-00120313
...SAV 08.00  002014+ GEN    100. 00055500 LB0:-00121216
...UFD 05.00  002022+ GEN    100. 00005700 LB0:-00121726
...ACS 2.01   002000+ GEN     70. 00003600 LB0:-00117372
```

```
...ACC 2.0    001742+ GEN     65. 00030300 LB0:-00117204
...SHA 03.00  002016+ GEN     65. 00027300 LB0:-00122036
...AT. 6.0    001756+ GEN     64. 00073000 LB0:-00014733
...INI 23.00  001760+ GEN     60. 00035100 LB0:-00120221
...HOM 23.00  001762+ GEN     60. 00035100 LB0:-00120221
...BRO 05.00  001744+ GEN     50. 00034400 LB0:-00117433
...BYE 03.00  001746+ GEN     50. 00015500 LB0:-00117472
...HEL 2.00   001754+ GEN     50. 00026000 LB0:-00120074
...PIP 16.00  001772+ GEN     50. 00026400 LB0:-00016745
...UNL 4.0    001776+ GEN     50. 00031600 LB0:-00121736
...BOO 06.02  002002+ GEN     50. 00030200 LB0:-00117401
...CON 02     002004+ GEN     50. 00126100 LB0:-00011131
...ELI 1.00   002006+ GEN     50. 00016700 LB0:-00117561
...LOA 4.0    002010+ GEN     50. 00035700 LB0:-00120561
...MAG 01.02  002012+ GEN     50. 00034300 LB0:-00120475
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
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
DDB     OFL     CPA     CSR=176510      VEC=310 PRI=4
LPA     OFL     CPA     CSR=177514      VEC=200 PRI=4
CO0:                    OFL     DRIVER
TT0:    YLA0:           OFL     DRIVER
TT1:    YZA0:           OFL     DRIVER
TT2:    YZA1:           OFL     DRIVER
TT3:    YZA2:           OFL     DRIVER
TT4:    YZA3:           OFL     DRIVER
TT5:    YZA4:           OFL     DRIVER
TT6:    YZA5:           OFL     DRIVER
TT7:    YZA6:           OFL     DRIVER
TT10:   YZA7:           OFL     DRIVER
VT0:                    OFL     DRIVER
RD0:                    ONL     DRIVER
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
DD2:    DDB0:           OFL     DRIVER
DD3:    DDB1:           OFL     DRIVER
LP0:    LPA0:           OFL     DRIVER
NL0:                    OFL     DRIVER
POOL=1200:12996.:13502.:1742
>SET /UIC=[200,200]
>;
>; End of SYSGEN
>;
>TIME
14:14:14 19-APR-83
>;
>ASN =
>;
>@ <EOF>
>
>
```

```
>BOO [1,54]
XDT: 15

XDT>G
RSX-11M-PLUS V2.1  BL15


>
 TIM 14:15 19-APR-83
>TIM
14:15:05 19-APR-83
>SAV


RSX-11M-PLUS V2.1  BL15   384.KW  System:"EXMPL1"
>RED DM:=SY:
>RED DM:=LB:
>RED DM:=SP:
>MOU DM:"RSX11MPBL15"
>@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]: ^Z
>@ <EOF>
>
>
>SAV /WB
DM0 -- System disk being dismounted
DM0 -- SYSTEM  dismounted from DM0:    *** Final dismount initiated ***
14:15:26  *** DM0:  -- Dismount complete
>


RSX-11M-PLUS V2.1  BL15   384.KW  System:"EXMPL1"
>RED DM:=SY:
>RED DM:=LB:
>RED DM:=SP:
>MOU DM:"RSX11MPBL15"
>@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]: 14:16 4/19/83
>TIM 14:16 4/19/83
>ACS SY:/BLKS=1024.
>CON ONLINE ALL
>ELI /LOG/LIM
14:16:04  ERRLOG -- Error Logging initialized
>CLI /INIT=DCL
>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 $QMGPRT/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 MM2:/FOR/NOSHARE
>MOU DR2:/FOR/NOSHARE
>
>RUN $BAD
BAD>DR2:/LIST
BAD -- DR2: Bad block found - LBN= 84557.
BAD -- DR2: Bad block found - LBN= 84717.
BAD -- DR2: Bad block found - LBN= 84877.
BAD -- DR2: Bad block found - LBN= 85037.
BAD -- DR2: Total bad blocks= 4.
BAD>^Z
>
>RUN $BRU
BRU>/DENSITY:800/VERIFY/INITIALIZE/MAX:10567/HEADERS:4049
From:   MM2:
To:     DR2:
BRU - Starting Tape 1 on MM2:

BRU - End of Tape 1 on MM2:

BRU - Starting verify pass Tape 1 on MM2:

BRU - End of Tape 1 on MM2:

BRU - Completed

BRU>^Z
>
>DMO DR2:/LOCK=NOUNLOAD
DMO -- TT36:   dismounted from DR2:    *** Final dismount initiated ***
>
>MOU DR2:RSX11MPBL15
>ASN DR2:=SY:
>
>SET /UIC=[2,54]
>@BASTART
>;
>;       RSX-11M-PLUS V2.1 Online Distribution Kit Installation Procedure
>;
>;       This command file installs the RSX-11M-PLUS V2.1 kit and
>;       prepares it for the performance of a SYSGEN. It assumes the
>;       current environment is an up-and-running RSX-11M-PLUS V2.1
>;       or RSX-11M-PLUS V2.0 system. All the necessary devices must
>;       already be configured online. The current system will not be
>;       affected in any way by the execution of this file.
>;
>* Enter the name of the target system disk [S]: DR2:
>ASN DR2:=SY:
>ASN DR2:=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
>;
>;       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]: MM2:
>* Do you have the 1600-bpi magnetic tape distribution kit? [Y/N]: N
```

```
>* Is the tape on MM2: mounted foreign? [Y/N]: Y
>;
>;      Prepare to bring in the remainder of the distribution kit
>;
>* Is your target system disk an RK07? [Y/N]: N
>;
>;      Ensure that the BRU task is installed.
>;
>;
>;      We will now load the remainder of the distribution kit.
>;
>TIME
17:12:04 19-APR-83
>;
>BRU /BAC:MPLUSBL15SRC/UFD/NOINI/DENS:800 MM2: SY:
BRU - Starting Tape 1

BRU - End of Tape 1

BRU - Mount Tape 2 on MM2:

BRU - Starting Tape 2 on MM2:

BRU - End of Tape 2 on MM2:

BRU - Completed

>;
>DMO MM2:/LOCK=H
DMO -- TT36:   dismounted from MM2:    *** Final dismount initiated ***
>;
>TIME
17:28:46 19-APR-83
>;
>;      We will now create any UFDs that must be created on your disk(s).
>;      You will not see the UFD commands.
>;
>TIME
17:29:10 19-APR-83
>;
>;
>;      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 online, 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>
>
>
>ASN DR2:=SY:
>SET /UIC=[200,200]
>
>
```

```
>@SYSGEN
>;
>; RSX-11M-PLUS  SYSGEN  BL15
>;
>; COPYRIGHT (C)  1983
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>;
>TIM
17:30:07 19-APR-83
>;
>; 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.
>;
>; 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]:
>;
>; 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]:
>;
>* SU040   Do you want to use a saved answer file as input for
>*         the peripheral configuration? [Y/N D:N]:
>;
>* SU060   Do you want to use a saved answer file as input for
>*         the nonprivileged task builds? [Y/N D:N]:
>;
>* SU080   Do you want to do a PREPGEN? [Y/N D:N]: Y
>;
>;
>* SU090   Enter the name of the disk drive containing your
>*         target system disk [ddnn:] [S R:2-5]: DR2:
>;
>ASN DR2:=IN:
>ASN DR2:=OU:
>ASN DR2:=SY:
>ASN DR2:=LB:
>ASN DR2:=WK:
>ASN DR2:=TK:
>ASN DR2:=BC:
>ASN DR2:=LI:
>ASN DR2:=OB:
>ASN DR2:=EX:
>ASN DR2:=MP:
>;
```

```
>; You can:
>;
>;    o  do a complete SYSGEN
>;
>;    o  continue a previous SYSGEN from where you left off
>;
>;    o  do an individual section of SYSGEN
>;
>;
>* SU120   Do you want to do a complete SYSGEN? [Y/N D:Y]:
>;
>;
>;
>;=====================================================
>;  Choosing Executive Options      19-APR-83 at 17:30
>;=====================================================
>;
>;
>;
>; 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.
>;                                                                    V
>* Comment [S R:0.-55.]: Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>* Comment [S R:0.-55.]: and Installation Guide
>* Comment [S R:0.-55.]:
>;
>* CE010   What is your target processor type? [S R:5.-12. D:"11/70"]: 11/24
>;
>* CE020   Do you want the Full-functionality Executive? [Y/N D:Y]: N
>;
>;      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]:
>;
>* CE070   Do you want support for task headers out-of-pool? [Y/N D:N]: Y
>;
>* CE090   Do you want to use FCSRES, the FCS resident library? [Y/N D:N]: Y
>;
>* CE100   Do you want all DIGITAL-supplied drivers and their data bases
>*         to be loadable? [Y/N D:N]: Y
>;
>* CE120   Do you want support for communications products
>*         (such as DECnet)? [Y/N D:N]: Y
>;
>* CE124   Do you want SPM-11 support? [Y/N D:N]:
>;
>* CE130   What is the system name? [S R:0-6 D:"RSXMPL"]: EXMPL2
>;
>* CE140   Do you want shadow recording support? [Y/N D:N]:
>;
>* CE150   Do you want console driver support? [Y/N D:N]:
>;
>* CE160   Do you want accounting support? [Y/N D:N]: Y
>;
```

```
>* CE170   Do you want to include the batch processor? [Y/N D:N]: Y
>;
>* CE200   Which FCP do you want? [S R:1-6 D:"FCPLRG"]:
>;
>; Two versions of the file system ACP (F11ACP) 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"]:
>;
>* CE210   Do you want support for file windows in secondary pool? [Y/N D:N]:
>;
>; 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
>;
>* CE230   What is the default virtual terminal unit buffer
>*         size? [D R:1.-512. D:120.]:
>;
>* CE240   What is the maximum virtual terminal unit buffer
>*         size? [D R:1.-512. D:184.]:
>;
>* CE260   Enter unsolicited input time-out (in seconds) [D R:0.-255. D:30.]:
>;
>* CE270   Do you want to include XDT? [Y/N D:N]: Y
>;
>* CE280   Enter the crash notification device CSR
>*         address [O R:160000-177700 D:177564]:
>;
>* CE290   On what device do you wish crash dumps to be written? [S R:2-3]: MM
>;
>* CE300   What is the physical unit number of the crash unit? [O R:0-7 D:0]:
>;
>* CE310   Enter memory size (in K words) [D R:128.-1920. D:256.]:
>;
>* CE320   Do you want floating point processor support? [Y/N D:N]: Y
>;
>* CE330   Is your system clock programmable (KW11-P)? [Y/N D:N]:
>;
>* CE350   Is your line frequency 50 Hz? [Y/N D:N]:
>;
>;
>;
>;============================================================
>;  Choosing Peripheral Configuration      19-APR-83 at 17:32
>;============================================================
>;
>;
>;
>; 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.
>;                                                                  V
```

```
>* Comment [S R:0.-55.]: Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>* Comment [S R:0.-55.]: and Installation Guide
>* Comment [S R:0.-55.]:
>;
>;
>* CP0604  How many RH controllers do you have? [D R:0.-15. D:4.]: 3
>;
>* 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, a DB type disk and a DR type disk
>; both connected to RHA.  Having an RP04 and an RP06 (both DB type
>; disks) connected to the same controller is NOT a mixed MASSBUS
>; configuration.
>;
>; If you choose to generate a mixed MASSBUS configuration, all the
>; MASSBUS device data bases will be resident.
>;
>* CP0612  Do you want to generate a mixed MASSBUS configuration? [Y/N D:N]:
>;
>;
>;   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.]:
>;
>;
>;   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
>;
>* CP1020  Are any of the units dual-access? [Y/N D:N]:
>;
>; 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
>;
>;
>* CP1036  What is the physical unit number of DR0:? [O R:0-7 D:0]:
>;
>* CP1040  Is DR0: a dual-access unit? [Y/N D:N]: Y
>;
>* CP1048  To which RH controller is port A of DR0: connected? [S R:1-1]: A
>;
>* CP1048  To which RH controller is port B of DR0: connected? [S R:1-1]: B
>;
>* CP1060  Is DR0: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02
>;
>;
>* CP1036  What is the physical unit number of DR1:? [O R:0-7 D:1]:
>;
>* CP1040  Is DR1: a dual-access unit? [Y/N D:N]: Y
>;
>* CP1048  To which RH controller is port A of DR1: connected? [S R:1-1]: A
>;
>* CP1048  To which RH controller is port B of DR1: connected? [S R:1-1]: B
>;
>* CP1060  Is DR1: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02
>;
>;
```

```
>* CP1036  What is the physical unit number of DR2:? [O R:0-7 D:2]:
>;
>* CP1040  Is DR2: a dual-access unit? [Y/N D:N]: Y
>;
>* CP1048  To which RH controller is port A of DR2: connected? [S R:1-1]: A
>;
>* CP1048  To which RH controller is port B of DR2: connected? [S R:1-1]: B
>;
>* CP1060  Is DR2: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02
>;
>;
>* CP1036  What is the physical unit number of DR3:? [O R:0-7 D:3]:
>;
>* CP1040  Is DR3: a dual-access unit? [Y/N D:N]: Y
>;
>* CP1048  To which RH controller is port A of DR3: connected? [S R:1-1]: A
>;
>* CP1048  To which RH controller is port B of DR3: connected? [S R:1-1]: B
>;
>* CP1060  Is DR3: an RM02, RM03, RM05, RM80, or RP07? [S R:4-4 D:"RP07"]: RM02
>;
>;
>;   DS:    controllers: RH11, RH70     devices: RS03, RS04
>;
>* CP1208  How many RS03/04 disk drives do you have? [D R:0.-63. D:0.]:
>;
>;
>;   EM:    controllers: RH11, RH70     device: ML11
>;
>* CP1408  How many ML11 disks do you have? [D R:0.-63. D:0.]:
>;
>;
>;   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
>;
>* CP1612  How many TM02/03 magtape formatters do you
>*         have? [D R:1.-5. D:1.]:
>;
>; 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.)
>;
>* CP1612  How many TM02/03 magtape formatters do you
>*         have? [D R:1.-5. D:1.]: 2
>;
>;
>* CP1636  What is the physical unit number of the next
>*         formatter? [O R:0-7 D:0]:
>;
>* CP1644  To which RH controller is this formatter connected? [S R:1-1]: C
>;
>* CP1652  How many tape drives are attached to this
>*         formatter? [D R:1.-4. D:4.]: 2
>;
```

```
>* CP1656  What is the physical unit number of MM0:? [O R:0-7 D:0]:
>;
>* CP1656  What is the physical unit number of MM1:? [O R:0-7 D:1]:
>;
>;
>* CP1636  What is the physical unit number of the next
>*         formatter? [O R:0-7 D:1]: 2
>;
>* CP1644  To which RH controller is this formatter connected? [S R:1-1]: C
>;
>; The 3. remaining tape drive(s) will be allocated to this formatter.
>;
>;
>* CP1656  What is the physical unit number of MM2:? [O R:0-7 D:2]:
>;
>* CP1656  What is the physical unit number of MM3:? [O R:0-7 D:3]:
>;
>* CP1656  What is the physical unit number of MM4:? [O R:0-7 D:4]:
>;
>;
>* CP2068  Enter the vector address of RHA [O R:60-774 D:254]:
>;
>* CP2072  What is its CSR address? [O R:160000-177700 D:176700]:
>;
>;
>* CP2068  Enter the vector address of RHB [O R:60-774 D:254]: 150
>;
>* CP2072  What is its CSR address? [O R:160000-177700 D:176700]: 176300
>;
>;
>* CP2068  Enter the vector address of RHC [O R:60-774 D:224]:
>;
>* CP2072  What is its CSR address? [O R:160000-177700 D:172440]:
>;
>;                          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:
>;
>;
>;
>;
>;    DK:     controller:  RK11            devices: RK05, RK05F
>;
>* CP2204  How many RK11 cartridge disk controllers do you have? [O D:0]:
>;
>;
>;    DM:     controllers: RK611, RK711    devices: RK06, RK07
>;
```

```
>* CP2404  How many RK611/711 disk cartridge controllers do
>*         you have? [O D:0]:
>;
>;
>;   DL:    controllers: RL11, RLV12    devices: RL01, RL02
>;
>* CP2604  How many RL11/RLV11 disk cartridge controllers do
>*         you have? [O D:0]: 1
>;
>* CP2608  How many RL01/RL02 disk drives do you have? [D R:1.-63. D:1.]: 2
>;
>;
>* CP2636  What is the physical unit number of DL0:? [O R:0-7 D:0]:
>;
>* CP2660  Is DL0: an RL01 or RL02? [S R:4-4 D:"RL02"]:
>;
>;
>* CP2636  What is the physical unit number of DL1:? [O R:0-7 D:1]:
>;
>* CP2660  Is DL1: an RL01 or RL02? [S R:4-4 D:"RL02"]:
>;
>;
>* CP2668  Enter the vector address of DLA [O R:60-774 D:160]:
>;
>* CP2672  What is its CSR address? [O R:160000-177700 D:174400]:
>;
>;                        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]:
>;
>;
>;   DU:    controllers: RQDX1, UDA50
>;          devices:     RX50,  RD51, RC25, RA60, RA80, RA81
>;
>* CP3004  How many MSCP disk controllers do you have? [D R:0.-63. D:0.]:
>;
>;
>;   CR:    controllers: CM11, CR11
>;
>* CP4004  How many CM/CR11 card readers do you have? [O D:0]:
>;
>;
>;   CT:    controller:  TA11          device:  TU60
>;
>* CP4204  How many TA11 dual cassettes do you have? [O D:0]:
>;
>;
>;   MS:    controllers: TS11, TU80, TSV05
>;
>* CP4404  How many TS11/TU80/TSV05 magtape controllers do you have? [O D:0]:
>;
>;
>;   DT:    controller:  TC11          device:  TU56
>;
```

```
>* CP4604  How many TC11 DECtape controllers do you have? [O D:0]:
>;
>;
>;   DX:    controller:  RX11           device:  RX01
>;
>* CP4804  How many RX11 disk controllers do you have? [O D:0]:
>;
>;
>;   DY:    controller:  RX211          device:  RX02
>;
>* CP5004  How many RX211 disk controllers do you have? [O D:0]: 1
>;
>* CP5068  Enter vector address of the next RX211 [O R:60-774 D:264]:
>;
>* CP5072  What is its CSR address? [O R:160000-177700 D:177170]:
>;
>* CP5076  How many drives does DYA have? [D R:1.-2. D:2.]:
>;
>;
>;   DD:    controller:  DL11           device:  TU58
>;
>* CP5204  How many TU58 controllers do you have? [O D:0]:
>;
>;
>;   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
>;
>* CP5408  Enter the number of seconds between
>*         line printer-not-ready messages [D R:0.-255. D:15.]: 240.
>;
>* CP5468  Enter vector address of the next line
>*         printer [O R:60-774 D:200]:
>;
>* CP5472  What is its CSR address? [O R:160000-177700 D:177514]:
>;
>* CP5480  Enter line printer type for LPA [S R:4-5 D:"LP25"]:
>;
>; 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
>;        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:
>;
>;    o  Column or buffer width
>;
>;       This is settable in VMR or MCR with the SET /BUF command.
>;
>;
>;    o  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? [O D:0]:
>;
>;
>;   PP:    controller:  PC11
>;
>* CP5804  How many PC11 paper tape reader/punches do you have? [O D:0]:
>;
>;
>;   PR:    controller:  PR11
>;
>* CP6004  How many PR11 paper tape readers do you have? [O D:0]:
>;
>;
>;   LA:    controller:  LPA11
>;
>* CP6204  How many LPA11 lab subsystems do you have? [D R:0.-16. D:0.]:
>;
>;
>;   IP:    controller:  IP11
>;
>* CP6404  How many IP11 industrial control subsystems do you have? [O D:0]:
>;
>;
>;   TT:    controllers: DL11, DLV11    controller mnemonic: YL
>;
>* CP6804  Enter number of additional DL11/DLV11 line interfaces [O D:0]:
>;
```

```
>* CP6832  Enter terminal type for YLA [S R:4-6 D:"LA120"]:
>;
>;
>;   TT:    controllers:  DH11, DHV11   controller mnemonic: YH
>;
>* CP7004  Enter number of DH11/DHV11 asynchronous line
>*         multiplexers [D R:0.-16. D:0.]: 1
>;
>* CP7020  Enter total number of DH11/DHV11 dial-up lines [D R:0.-16. D:0.]: 4
>;
>* CP7028  At which baud rate do you want to answer? [S R:2-5 D:"300"]:
>;
>; The valid baud rates are:
>;
>;        50
>;        75
>;       110
>;       134.5
>;       150
>;       200
>;       300
>;       600
>;      1200
>;      1800
>;      2400
>;      4800
>;      9600
>;      EXTA (external clock A)
>;      EXTB (external clock B)
>;
>* CP7028  At which baud rate do you want to answer? [S R:2-5 D:"300"]: 1200
>;
>* CP7040  Enter total number of DH11/DHV11 local lines [D R:0.-12. D:0.]: 12
>;
>* CP7068  Enter vector address of YHA [O R:300-770]: 310
>;
>* CP7072  What is its CSR address? [O R:160000-177700]: 160020
>;
>* CP7076  Enter vector address of the DM11-BB associated
>*         with YHA [O R:300-774]: 300
>;
>* CP7080  What is its CSR address? [O R:160000-177700 D:170500]:
>;
>* CP7084  Enter terminal type for YHA [S R:4-6 D:"VT100"]:
>;
>;
>;   TT:    controller:  DJ11           controller mnemonic: YJ
>;
>* CP7204  Enter number of DJ11 asynchronous line
>*         multiplexers [D R:0.-15. D:0.]:
>;
>;
>;   TT:    controllers: DZ11, DZV11    controller mnemonic: YZ
>;
>* CP7404  Enter number of DZ11/DZV11 asynchronous line
>*         multiplexers [D R:0.-30. D:0.]:
>;
>;
>* CP7604  Do you have any intercomputer communication devices? [Y/N D:N]:
>;
>;
>; 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
>* CP9604  Enter device mnemonics for user-supplied drivers [S]:
>;
>* CP9612  Do you want the JA: driver to be loadable? [Y/N D:N]: Y
>;
>* CP9616  Do you want the JA: driver's data base to be loadable? [Y/N D:N]: Y
>;
>;
>; 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]:
>;
>; If you will be adding other devices after this SYSGEN or have
>; included user-supplied devices, you will want to set the highest
>; interrupt vector address high enough to accommodate the vectors for
>; those devices.
>;
>; 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
>;
>;
>;
>;================================================================
>;  Assembling the Executive and Drivers      19-APR-83 at 17:42
>;================================================================
>;
>;
>;
>; 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]: Y
>;
>* AE020   What is to be the listing device [ddu:]? [S R:2-5 D:"SY:"]:
>;
>!ASN SY:=LS:
>;
>;
>* AE030   Do you wish to pause to edit any files before
>*         assembling? [Y/N D:N]: Y
>;
>; 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.:2112.:256.=[11,24]RSX11M.OBS
>;
>!LBR TTDRV/CR:40.:392.:128.=[11,24]TTDRV.OBS
>;
>;
>;
>;============================================================
>;  Building the Executive and Drivers      19-APR-83 at 17:43
>;============================================================
>;
>;
>;
>; The answers to the questions in this section are put in the saved
>; answer file [200,200]SYSGENSA1.CMD.
>;
>!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]:
>;
>!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
>;
>!TIME
>;
>!TKB @RSXBLD
>;
>!TIME
>;
>!TKB @[200,200]DRIVERS.BLD
>;
>!TIME
>;
>;
>;
```

```
>;=========================================================
>;  Building the Privileged Tasks      19-APR-83 at 17:43
>;=========================================================
>;
>;
>;
>; 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
>;
>* BP050   What is to be the map device [ddu:]? [S R:2-5 D:"SY:"]:
>;
>!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 @F11MSGBLD
>!TKB @HELRESBLD
>!TKB @HRCBLD
>!TKB @INIBLD
>!TKB @INSBLD
>!TKB @LOABLD
>!TKB @LPPRESBLD
>!TKB @MCRBLD
>!TKB @MCDBLD
>!TKB @MOUBLD
>!TKB @MTABLD
>!TKB @PMDRESBLD
>!TKB @PMTBLD
>!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      19-APR-83 at 17:43
>;============================================================
>;
>;
>;
>; 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
>;
>; 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.
>;                                                                    V
>* Comment [S R:0.-55.]: Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>* Comment [S R:0.-55.]: and Installation Guide
>* Comment [S R:0.-55.]:
>;
>; The following nonprivileged tasks and utilities can be built at this time:
>;
>;      BAD             DMPFSL          IOX             RPTFSL
>;      BRU             DSC             IOXRES          SLP
>;      CDA             EDI             IOXFSL          SLPRES
>;      CDARES          EDIRES          LBR             SLPFSL
>;      CDAFSL          EDIFSL          LBRRES          STK
>;      CFL             EDT             LBRFSL          STKFSL
>;      CFLFSL          EDTRES          MAC             TDX
>;      CMP             EDTFSL          MACRES          TKB
>;      CMPRES          FLX             MACFSL          TKBRES
>;      CMPFSL          FLXRES          PAT             TKBFSL
>;      CON             FLXFSL          PATRES          VFY
>;      CRF             FMT             PATFSL          VFYRES
>;      CRFRES          FTB             PIP             VFYFSL
>;      CRFFSL          FTBRES          PIPRES          VMR
>;      DCL             FTBFSL          PIPFSL          ZAP
>;      DLD             ICM             QMGCLI          ZAPRES
>;      DMP             ICMRES          QMGPRT          ZAPFSL
>;      DMPRES          ICMFSL          RPT
>;
>; 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.
>;
>; 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]: ALLRES
>*         Enter task name(s) [S]:
>;
>;
>* BN030   Do you want the maps of the nonprivileged tasks? [Y/N D:N]:
>;
>!ASN NL:=MP:
>;
>* BN050   Do you want to pause to edit any files before
>*         task-building? [Y/N D:N]:
>;
```

```
>!SET /UIC=[1,24]
>;
>!TKB @CDARESBLD
>!TKB @CMPRESBLD
>!TKB @CRFRESBLD
>!TKB @DMPRESBLD
>!TKB @EDIRESBLD
>!TKB @EDTRESBLD
>!TKB @FLXRESBLD
>!TKB @FTBRESBLD
>!TKB @ICMRESBLD
>!TKB @IOXRESBLD
>!TKB @LBRRESBLD
>!TKB @MACRESBLD
>!TKB @PATRESBLD
>!TKB @PIPRESBLD
>!TKB @SLPRESBLD
>!TKB @TKBRESBLD
>!TKB @VFYRESBLD
>!TKB @ZAPRESBLD
>;
>;
>;
>;============================================================
>;  Creating the System Image File      19-APR-83 at 17:45
>;============================================================
>;
>;
>!SET /UIC=[1,54]
>;
>!PIP OU:RSX11M.SYS/CO/NV/BL:1026.=RSX11M.TSK
>;
>!ASN LB:=SY:
>!VMR @SYSVMR
>;
>; End of SYSGEN
>;
>TIME
17:45:51 19-APR-83
>;
>ASN =
>;
>@ <EOF>
>
>
>ASN DR2:=SY:
>SET /UIC=[200,200]
>
>
>@SYSGEN
>;
>; RSX-11M-PLUS  SYSGEN  BL15
>;
>; COPYRIGHT (C)  1983
>; DIGITAL EQUIPMENT CORP., MAYNARD MA., 01754
>;
>TIM
17:47:14 19-APR-83
>;
>; 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.
>;
```

```
>; 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]:
>;
>; 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
>;
>* SU030   Enter saved answer file name [S D:"SYSGENSA1.CMD"]:
>;
>* SU040   Do you want to use a saved answer file as input for
>*         the peripheral configuration? [Y/N D:N]: Y
>;
>* SU050   Enter saved answer file name [S D:"SYSGENSA2.CMD"]:
>;
>* SU060   Do you want to use a saved answer file as input for
>*         the nonprivileged task builds? [Y/N D:N]: Y
>;
>* SU070   Enter saved answer file name [S D:"SYSGENSA3.CMD"]:
>;
>* SU080   Do you want to do a PREPGEN? [Y/N D:N]:
>;
>;
>* SU090   Enter the name of the disk drive containing your
>*         target system disk [ddnn:] [S R:2-5]: DR2:
>;
>ASN DR2:=IN:
>ASN DR2:=OU:
>ASN DR2:=SY:
>ASN DR2:=LB:
>ASN DR2:=WK:
>ASN DR2:=TK:
>ASN DR2:=BC:
>ASN DR2:=LI:
>ASN DR2:=OB:
>ASN DR2:=EX:
>ASN DR2:=MP:
>;
>; You can:
>;
>;    o  do a complete SYSGEN
>;
>;    o  continue a previous SYSGEN from where you left off
>;
>;    o  do an individual section of SYSGEN
>;
>;
```

```
>* SU120   Do you want to do a complete SYSGEN? [Y/N D:Y]:
>;
>;
>;
>;=====================================================
>;  Choosing Executive Options      19-APR-83 at 17:47
>;=====================================================
>;
>;
>; Using saved answer file DR2:[200,200]SYSGENSA1.CMD;1
>; created on 19-APR-83 at 17:30:24.
>;
>; Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>; and Installation Guide
>;
>;
>;
>;
>;============================================================
>;  Choosing Peripheral Configuration      19-APR-83 at 17:47
>;============================================================
>;
>;
>; Using saved answer file DR2:[200,200]SYSGENSA2.CMD;1
>; created on 19-APR-83 at 17:32:26.
>;
>; Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>; and Installation Guide
>;
>;
>;
>;   DR:    controllers: RH11, RH70     devices: RM02
>;                       RH70                   RM03, RM05, RM80, RP07
>;
>;
>;   MM:    controllers: RH11, RH70     devices: TE16, TU16, TU45, TU77
>;          formatters:  TM02, TM03
>;
>;                         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          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:  DH11, DHV11   controller mnemonic: YH
>;
>; 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      19-APR-83 at 17:54
>;================================================================
>;
>;
>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 SY:=LS:
>;
>;
>; SYSGEN will now pause to let you edit any files before assembling
>; the Executive and drivers.
>;

AT.T36 --  Pausing. To continue type "UNS AT.<ESC>"
>
SET /UIC=[11,10]
>PIP /NV=DB7:[7,20]JADRV.MAC,JATAB
>UNS AT.

AT.T36 -- Continuing
>;
>SET /UIC=[11,24]
>;
```

```
>PIP *.OBJ;*/DE/NM,*.TTY;*
>;
>TIME
17:55:17 19-APR-83
>;
>MAC @RSXASM
>;
>TIME
18:15:47 19-APR-83
>;
>MAC @DRIVERS.ASM
>;
>TIME
18:26:59 19-APR-83
>;
>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.:2112.:256.=[11,24]RSX11M.OBS
>;
>LBR TTDRV/CR:40.:392.:128.=[11,24]TTDRV.OBS
>SET /UIC=[200,200]
>;
>;
>;
>;============================================================
>;  Building the Executive and Drivers      19-APR-83 at 18:29
>;============================================================
>;
>;
>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
>;
>TIME
18:33:37 19-APR-83
>;
>TKB @RSXBLD
>;
>TIME
18:38:09 19-APR-83
>;
>TKB @[200,200]DRIVERS.BLD
>;
>TIME
18:40:15 19-APR-83
>SET /UIC=[200,200]
>;
>;
>;
```

```
>;=========================================================
>;  Building the Privileged Tasks      19-APR-83 at 18:40
>;=========================================================
>;
>;
>;
>ASN SY:=MP:
>;
>SET /UIC=[1,24]
>;
>TIME
18:40:19 19-APR-83
>;
>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 @F11MSGBLD
>TKB @HELRESBLD
>TKB @HRCBLD
>TKB @INIBLD
>TKB @INSBLD
>TKB @LOABLD
>TKB @LPPRESBLD
>TKB @MCRBLD
>TKB @MCDBLD
>TKB @MOUBLD
>TKB @MTABLD
>TKB @PMDRESBLD
>TKB @PMTBLD
>TKB @QMGRESBLD
>TKB @RMDBLD
>TKB @SAVBLD
>TKB @SHFBLD
>TKB @SHUBLD
>TKB @SYLRESBLD
>TKB @TKNBLD
>TKB @UFDBLD
>TKB @UNLRESBLD
>;
>TIME
19:12:54 19-APR-83
>;
>ASN LB:=OU:
>SET /UIC=[200,200]
>;
>;
>;
```

```
>;===========================================================
>;  Building the Nonprivileged Tasks      19-APR-83 at 19:12
>;===========================================================
>;
>;
>; Using saved answer file DR2:[200,200]SYSGENSA3.CMD;1
>; created on 19-APR-83 at 17:43:51.
>;
>; Example SYSGEN for RSX-11M-PLUS V2.1 System Generation
>; and Installation Guide
>;
>;
>SET /UIC=[1,24]
>SET /UIC=[200,200]
>;
>ASN NL:=MP:
>;
>SET /UIC=[1,24]
>;
>TKB @CDARESBLD
>TKB @CMPRESBLD
>TKB @CRFRESBLD
>TKB @DMPRESBLD
>TKB @EDIRESBLD
>TKB @EDTRESBLD
>TKB @FLXRESBLD
>TKB @FTBRESBLD
>TKB @ICMRESBLD
>TKB @IOXRESBLD
>TKB @LBRRESBLD
>TKB @MACRESBLD
>TKB @PATRESBLD
>TKB @PIPRESBLD
>TKB @SLPRESBLD
>TKB @TKBRESBLD
>TKB @VFYRESBLD
>TKB @ZAPRESBLD
>SET /UIC=[200,200]
>;
>;
>;
>;===========================================================
>;  Creating the System Image File      19-APR-83 at 19:35
>;===========================================================
>;
>;
>SET /UIC=[1,54]
>;
>PIP OU: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 00100300  MAIN
       117624 00220000 00034000  RO COM !DIR11M!
       117540 00254000 00003400  TASK    [...LDR]
       116624 00257400 00026200  TASK    [MCR...]
       116424 00305600 00007400  TASK    [TKTN  ]
```

```
        116224 00315200 00003100  TASK   [SHF...]
DRVPAR  116144 00320300 00064200  MAIN
        116100 00320300 00034600  DRIVER (TT:)
        115060 00355100 00005400  DRIVER (DR:)
        114130 00362500 00005300  DRIVER (MM:)
        113540 00370000 00003100  DRIVER (DL:)
        113174 00373100 00003100  DRIVER (DY:)
        112734 00376200 00001100  DRIVER (LP:)
        112524 00377300 00000100  DRIVER (NL:)
        112460 00377400 00002400  DRIVER (VT:)
        112414 00402000 00001300  DRIVER (RD:)
        112064 00403300 00001200  DRIVER (JA:)
GEN     112000 00404500 01373300  MAIN
...LDR  11.05  117400  SYSPAR 248. 00003400 LB0:-00232074 FIXED
TKTN    06.00  116470  SYSPAR 248. 00007400 LB0:-00240215 FIXED
F11MSG  13.00  110054  GEN    200. 00006100 LB0:-00233716
MTAACP  14.00  107474  GEN    200. 00015100 LB0:-00236434
MCR...  5.00   117074  SYSPAR 160. 00026200 LB0:-00236151 FIXED
F11ACP  05.00  111570  GEN    149. 00014200 LB0:-00233567
ERRLOG  2.00   111240  GEN    148. 00042500 LB0:-00233471
PMT...  2.00   110600  GEN    148. 00006700 LB0:-00237210
HRC...  02     107614  GEN    140. 00056200 LB0:-00234617
PMD...  06.00  107350  GEN    140. 00017000 LB0:-00237140
SYSLOG  1.03   110330  GEN    130. 00021300 LB0:-00240155
SHF...  6.00   116270  SYSPAR 105. 00003100 LB0:-00240027 FIXED
FXR...  02.00  107734  GEN    100. 00003200 LB0:-00233706
BAP0    04.00  111360  GEN     80. 00046600 LB0:-00232677
QMG...  03.00  110454  GEN     75. 00033500 LB0:-00237225
LP0     03.00  111014  GEN     70. 00014600 LB0:-00235307
ACNT    05.00  110204  GEN     50. 00040300 LB0:-00232537
SHUTUP  03.00  107230  GEN     50. 00012000 LB0:-00240040
...RMD  2.00   001232+ GEN    225. 00030200 LB0:-00237320
...DCL  2.0    001206+ GEN    160. 00040500 LB0:-00011370
...DMO  04.00  001210+ GEN    160. 00016200 LB0:-00233403
...MCR  3.00   001224+ GEN    160. 00040200 LB0:-00235620
...MOU  26.00  001226+ GEN    160. 00040300 LB0:-00236313
...CA.  11     001254+ GEN    150. 00022300 LB0:-00022160
...INS  14.00  001222+ GEN    100. 00043700 LB0:-00235026
...SAV  08.00  001252+ GEN    100. 00055500 LB0:-00237706
...UFD  05.00  001256+ GEN    100. 00005700 LB0:-00240330
...ACS  2.01   001236+ GEN     70. 00005000 LB0:-00232612
...ACC  2.0    001200+ GEN     65. 00031200 LB0:-00232336
...AT.  6.0    001214+ GEN     64. 00073700 LB0:-00015064
...INI  23.00  001216+ GEN     60. 00035100 LB0:-00234702
...HOM  23.00  001220+ GEN     60. 00035100 LB0:-00234702
...BRO  05.00  001202+ GEN     50. 00034400 LB0:-00233213
...BYE  03.00  001204+ GEN     50. 00015500 LB0:-00233354
...HEL  2.00   001212+ GEN     50. 00026700 LB0:-00233751
...PIP  16.00  001230+ GEN     50. 00033400 LB0:-00017024
...UNL  4.0    001234+ GEN     50. 00031600 LB0:-00240346
...BOO  06.02  001240+ GEN     50. 00030200 LB0:-00232630
...CON  02     001242+ GEN     50. 00126100 LB0:-00011131
...ELI  1.00   001244+ GEN     50. 00017400 LB0:-00233436
...LOA  4.0    001246+ GEN     50. 00035700 LB0:-00235114
...MAG  01.02  001250+ GEN     50. 00034300 LB0:-00237066
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
YHA      OFL     CPA     CSR=160020      VEC=310 PRI=5
YMA      OFL     CPA     CSR=170500      VEC=300 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
JAA      OFL     CPA     CSR=177404      VEC=220 PRI=5
```

```
TT0:    YLA0:           OFL     DRIVER
TT1:    YHA0:           OFL     DRIVER
TT2:    YHA1:           OFL     DRIVER
TT3:    YHA2:           OFL     DRIVER
TT4:    YHA3:           OFL     DRIVER
TT5:    YHA4:           OFL     DRIVER
TT6:    YHA5:           OFL     DRIVER
TT7:    YHA6:           OFL     DRIVER
TT10:   YHA7:           OFL     DRIVER
TT11:   YHA10:          OFL     DRIVER
TT12:   YHA11:          OFL     DRIVER
TT13:   YHA12:          OFL     DRIVER
TT14:   YHA13:          OFL     DRIVER
TT15:   YHA14:          OFL     DRIVER
TT16:   YHA15:          OFL     DRIVER
TT17:   YHA16:          OFL     DRIVER
TT20:   YHA17:          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
LP0:    LPA0:           OFL     DRIVER
NL0:                    OFL     DRIVER
JA0:    JAA0:           OFL     DRIVER
JA1:    JAA1:           OFL     DRIVER
POOL=1200:1708.:02216.:1200
>SET /UIC=[200,200]
>;
>; End of SYSGEN
>;
>TIME
19:39:06 19-APR-83
>;
>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.

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	176174	40	254	1.	5	
TC11	177342	20	214	1.	6	
UDA50	177510	4	154	1.	5	UDA, RC25, and RQDX1 devices
RX11/RX211	177170	10	264	1.	5	
RH11/RH70	172040	40	204	1.	5	RS03/RS04
RH11/RH70	172440	40	224	1.	5	TU16/45/77,TE16
RH11/RH70	175400	100	260	1.	5	RS/RP/RM/TU ALT.
RH11/RH70	176300	100	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 or TSV05	172522	4	224	8.	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	4	070	1.	4	
PC11	177554	4	074	1.	4	
DH11/DHV11	FLOAT	20	Rank 16	16.	5	
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/DZV11	FLOAT	10	Rank 28	16.	5	

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 device is always on a 2*N word boundary, where N is the first integer greater than or equal to LOG M and M is the number of device registers.

Number of Registers in Device	Possible Boundaries
1	Any word
2	XXXXX0,XXXXX4
3,4	XXXXX0
5,6,7,8	XXXX00,XXXX20,XXXX40,XXXX60
9 thru 16	XXXX00,XXXX40

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 that you 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.

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.

❶ Record quantity of each device:

DJ11		DUP11		KMC11*	0
DH11		LK11*	0		
DQ11*	0	DMC11			
DU11*	0	DZ11			

❷ Enter unit numbers:

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

* 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

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

❸ 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

❶ Record quantity of each device:

DJ11	0	DUP11	1	KMC11*	0
DH11	3	LK11*	0		
DQ11*	0	DMC11	2		
DU11*	0	DZ11	3		

❷ Enter unit numbers:

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

* 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

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

DEVICE

ADDRESS	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					
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														
	DJ11	DH11	DQ11*	DU11*	DUP11	LK11*	DMC11	DZ11	KMC11*					

❸ List UNIBUS addresses for each device, reading from the tables just completed:

DEVICE	UNIT	ADDRESS	DEVICE	UNIT	ADDRESS	DEVICE	UNIT	ADDRESS
DH	0	760020	DZ	0	760210			
DH	1	760040	DZ	1	760220			
DH	2	760060	DZ	2	760230			
DUP	0	760130						
DMC	0	760160						
DMC	1	760170						

* 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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