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RSX-11M
System Generation Manual

Order No. AA-2552D-TC

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System Generation Manual

Order No. AA-2552D-TC

RSX-11M Version 3.1

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PREFACE

0.1 MANUAL OBJECTIVES AND READER ASSUMPTIONS

System generation is a fairly complicated process. To understand fully what is taking place, you must be knowledgeable in the operation of RSX-11M and its component tasks. Refer to Section 0.3 below for further information regarding related manuals and recommended reading.

NOTE

Users should undertake a system generation only with adequate planning. This includes a thorough study of the query programs in Chapter 3 and the answers the user will provide, so that the options for the Executive, processor, and peripherals are those describing the intended target system. In addition, a preliminary layout of memory partitions is essential if the later phases of the system generation process are to proceed smoothly.

0.2 STRUCTURE OF THE DOCUMENT

This manual provides information on how to generate an RSX-11M system tailored to a particular installation's hardware configuration. As delivered, RSX-11M includes an operational Executive, called the Baseline System. Section 0.4 describes the Baseline System and Section 2.3 describes the bootstrap procedures that the user must follow to load the system.

Chapter 1 contains an overview of the system generation process. It acquaints you with the various phases involved in producing a tailored system.

Chapter 2 describes the contents of the distribution kit and provides information on getting started.

The actual procedures involved in system generation are provided in Chapter 3. This chapter describes the step-by-step process followed in generating a system.

Chapter 4 covers procedures needed for generating larger multi-function systems.

Chapter 5 describes the commands and operation of Virtual Monitor Console Routine (VMR), a program that initializes the target system in the final stage of system generation.

The remaining sections comprise appendixes describing UIC conventions, RSX-11M operational hints, and a sample system generation.

0.3 ASSOCIATED DOCUMENTS

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

0.4 THE BASELINE SYSTEM

RSX-11M services a wide range of PDP-11 hardware configurations. The system generation process tailors a system to a local set of hardware and performance requirements.

The tailoring process is run on an RSX-11M system called the Baseline System. The Baseline System is a fully operational RSX-11M system built explicitly for generating target systems. It is not for general use because of the small size of the dynamic memory pool. The Baseline System contains the following Executive options and device support:

Executive options in the Baseline System:

- Files-11 Ancillary Control Processor (F11ACP)
- Checkpointing
- Nonresident task support
- Address checking (mapped system only)
- I/O rundown
- External MCR functions
- Task termination and device-not-ready messages
- GET PARTITION PARAMETERS directive
- GET TASK PARAMETERS directive
- Install, request, and remove on exit support
- Logical device assignment support
- At least 400. words of dynamic memory
- Loadable Drivers

Processor options in the Baseline System:

For unmapped RK05 disk systems--

16K of memory

For unmapped RP02/03, RP04/05/06, RK06, and dual RK05 systems--

24K of memory

For all mapped systems--

24K of memory

Memory management unit (KT11)

Peripheral device support in the single RK05 disk Baseline System:

2 RK05 disk drives

2 TA11 cassette drives *

2 TU56 DECTape drives *

2 RX01 floppy disk drives *

2 TE/TU10 or TS03 magtape drive *

2 TE/TU16 or TU45 magtape drive *

1 LP11 or LS11 line printer *

1 PC11 paper tape punch *

1 terminal

Peripheral device support in the dual RK05 disk Baseline System:

4 RK05 disk drives

2 TA11 cassette drives *

2 TU56 DECTape drives *

2 RX01 floppy disk drives *

2 TE/TU10 or TS03 magtape drive *

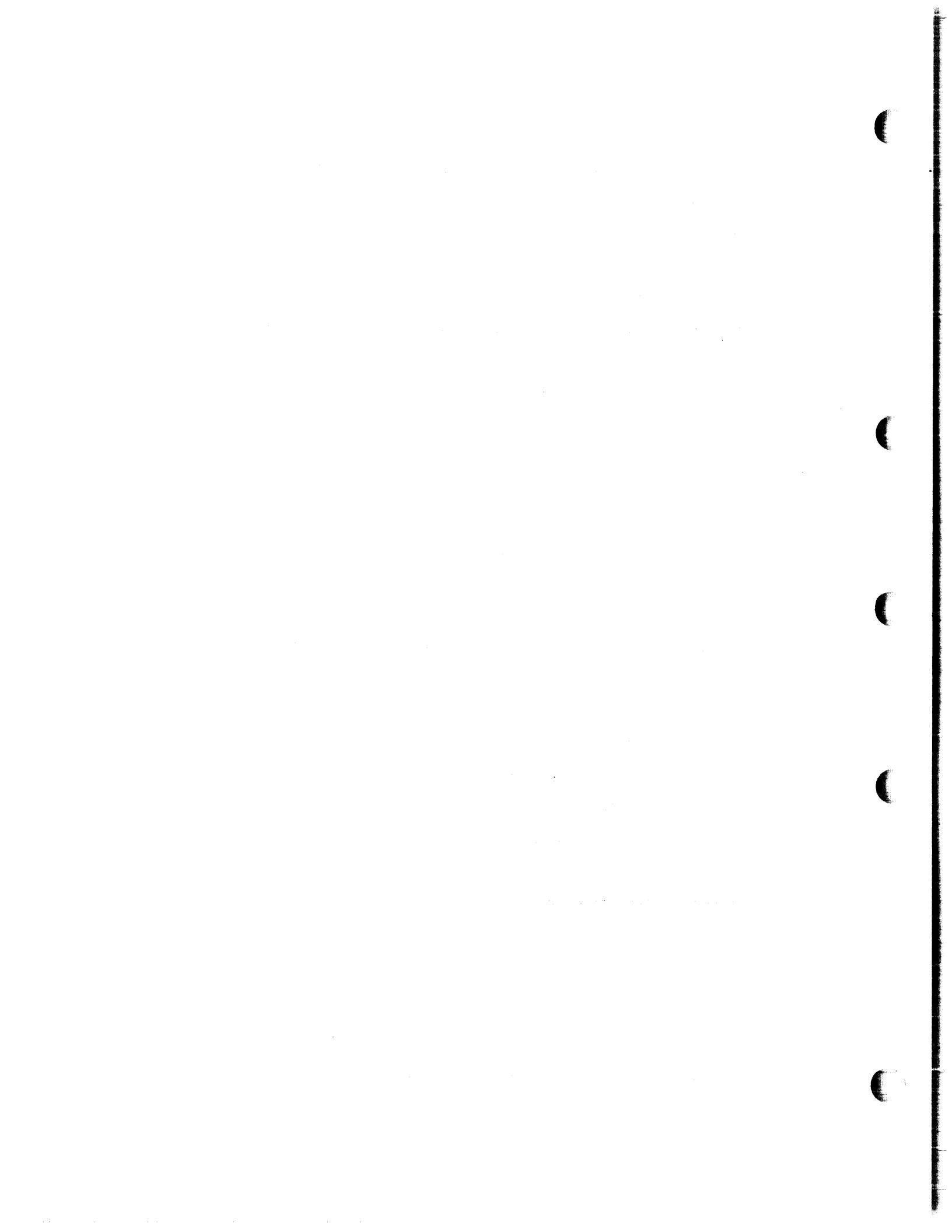
2 TE/TU16 or TU45 magtape drive *

1 LP11 or LS11 line printer *

1 PC11 paper tape punch *

1 terminal

* Supplied as a loadable driver with loadable data base.



CHAPTER 1

INTRODUCTION TO SYSTEM GENERATION

1.1 SYSTEM GENERATION OVERVIEW

The object of the system generation procedure (SYSGEN) is to create an RSX-11M system tailored to your local hardware configuration and performance requirements. This chapter provides an outline of the stages involved in performing system generation. Chapter 3 describes the system generation procedures.

The system generation process implies variability and choice. Five categories of choices are available:

1. Executive service options
2. Processor options
3. Peripheral devices
4. Partition configurations
5. Member tasks

You tailor a system to your local needs by selecting options from these five categories.

1.2 FUNCTIONAL FLOW OF SYSTEM GENERATION

SYSGEN has three separate phases. You perform a particular set of actions to produce specific system output for each phase. These three phases are:

1. Configuring and assembling the Executive.
2. Building the Executive and privileged tasks; setting up partitions, installing tasks, and bootstrapping and saving the new system.
3. Building the nonprivileged utility tasks. This step is usually unnecessary for unmapped systems if the SYSGEN received adequate planning and is not necessary on a mapped system unless you want to build the utilities (utility tasks are supplied in object form).

The entire SYSGEN process, of which the above phases are components, is directed by three indirect command files: SYSGEN.CMD; SYSGEN2.CMD; and SYSGEN3.CMD.

INTRODUCTION TO SYSTEM GENERATION

SYSGEN.CMD determines the features that will be included in the new system and assembles the Executive. The SYSGEN.CMD file does this by activating the following three query files:

- SGNEXEC.CMD - queries you to determine the desired executive service and processor options and produces the conditional assembly parameter file.
- SGNPER.CMD - queries you to determine the desired peripheral options and creates the Executive prefix file, the build files, and the device database for the system that is being generated.
- SGNTT.CMD - queries you to determine the data base for the system's terminals.

SYSGEN2.CMD builds the Executive and all of the privileged tasks.

SYSGEN3.CMD builds the non-privileged utility tasks and user mode diagnostics.

The dual RK05 distribution kit uses three additional indirect command files: PRESYSGEN.CMD, SGNXFER.CMD, and SGNXFER2.CMD.

PRESYSGEN.CMD - initializes the system for a dual RK05 SYSGEN. The command file prepares the system disk for use by the other system generation programs. PRESYSGEN.CMD chains (invokes) the indirect command file SYSGEN.CMD

SGNXFER.CMD - transfers control from SYSGEN.CMD to SYSGEN2.CMD. This transfer program is necessary because the files SYSGEN.CMD and SYSGEN2.CMD are on different disks.

SGNXFER2.CMD - transfers control from SYSGEN2.CMD to SYSGEN3.CMD and then back to SYSGEN2.CMD. Again, the transfer program is necessary because the files are on different disks.

1.2.1 Configuration and Assembly of the Executive

To use the Baseline Executive, which exists on the distribution disks, conduct this phase by answering the questions during SYSGEN.CMD that are asked by the three query files (SGNEXEC, SGNPER, SGNTT). When you answer these questions you will determine the:

1. Executive service options
2. Processor options
3. Peripheral device set

that will be incorporated into the Executive being created to service your configuration.

INTRODUCTION TO SYSTEM GENERATION

NOTE

The indirect command file SYSGEN.CMD provides the means for specifying all Executive options, processor options and peripheral devices to be generated for the target system. Thus, it is necessary to thoroughly read Chapter 3 and the RSX-11M Executive Reference Manual to know what and how to specify the options required in the target Executive. The SYSGEN.CMD file, and the query files it references, determine the processor and Executive options; also determined are the number and type of peripheral devices that are to be generated for the target system.

Your interaction with SYSGEN.CMD and the three query files results in the creation of five files on the disk:

1. RSXMC.MAC
2. SYSTB.MAC
3. RSXASM.CMD
4. RSXBLD.CMD
5. ICTAB.MAC (only if ICS/ICR-11 support is included)

RSXMC.MAC contains the conditional assembly parameters necessary to produce the user-tailored Executive.

SYSTB.MAC is a file of device table descriptions that define the peripheral configuration.

RSXASM.CMD is a MACRO-11 indirect command file that directs the conditional assembly of the user-tailored Executive. RSXBLD.CMD is a Task Builder indirect command file that directs the building of the user-tailored Executive.

ICTAB.MAC is a MACRO-11 source file that defines the module layout of an ICS/ICR-11 subsystem. It is generated only when you select the ICS/ICR-11 subsystem for inclusion in the target system.

After the questions asked by the query files have been answered and the five output files created, the user-tailored Executive is assembled via the indirect command file RSXASM.CMD. The indirect MCR command file SYSGEN.CMD directs both the configuration, query section, and assembly. Thus, to initiate Phase 1:

1. Mount the correct disk
2. Bootstrap the Baseline System
3. Enter the time and date

INTRODUCTION TO SYSTEM GENERATION

4. Initiate the indirect MCR command file, `SYSGEN.CMD`, for all distribution kits except the dual RK05 kit
5. Initiate the indirect MCR command file, `PRESYSGEN.CMD`, for dual RK05 systems

1.2.2 Setting Up Partitions, Building and Installing Tasks

During Phase 2, the following tasks are built: the user-tailored Executive, any loadable drivers, the privileged tasks, and, under certain conditions, some nonprivileged system tasks. At the end of building the Executive, you have a nonoperational Executive, and the value of the symbol `$SYTOP` is known.

The symbol `$SYTOP` represents the address of the last word in the user-tailored Executive, which enables you to determine the size of the Executive. A complete, operational system consists of:

1. An Executive
2. Resident and loadable drivers
3. Privileged and nonprivileged system tasks
4. User tasks
5. A set of memory partitions into which tasks can be installed and run

Having the value of `$SYTOP`, you can divide memory into the partitions and subpartitions needed to meet the application and performance requirements of the system.

The indirect MCR command file `SYSGEN2.CMD` controls this phase. Once you initiate `SYSGEN2.CMD`, it guides you through the building and installation of requisite tasks. On all kits except the single RK05 or the RL01 kit, `SYSGEN3.CMD` can be called directly by `SYSGEN2.CMD` to build the utility tasks. On single RK05 or RL01 kits, `SYSGEN3.CMD` is supplied on the utility disk, and must be run separately.

The building of privileged and nonprivileged system tasks occurs after you established partition boundaries, because these tasks ultimately execute in these partitions.

Using virtual MCR (VMR) and the disk image of the target system, you can now establish the partitions and install the tasks needed to complete the operational system.

Having created the operational system, complete with partitions and tasks, you now must bootstrap the system, using the MCR `BOOT` command, and then save the system, using the MCR `SAVE` command with the `/WB` switch appended. MCR saves the system and then automatically re-boots it.

The indirect command file, `SYSGEN2.CMD`, directs VMR processing to set partitions, install tasks, bootstrap and save the system.

For `SYSGENS` using a single RK05 kit or an RL01 kit, nonprivileged tasks cannot be built on the related object disk because of space limitations. The utility object disk contains all the files needed to build the nonprivileged tasks and the indirect command file `SYSGEN3.CMD` to direct the process.

INTRODUCTION TO SYSTEM GENERATION

For SYSGENS using any other kits, SYSGEN2.CMD directly calls SYSGEN3.CMD.

On all kits, SYSGEN3.CMD may be run separately at a later time.

1.3 DIFFERENCE BETWEEN MAPPED AND UNMAPPED SYSTEM

RSX-11M runs on all models of the PDP-11 processor except the LSI-11 or PDP-11/03. The basic addressing scheme of the processor instructions allows direct addressing of up to 32K words (64K bytes) of memory. Note the 4K words are reserved for UNIBUS I/O device registers (see the appropriate Processor Handbook). To use memories larger than 28K words, the memory management unit (KT11) must be present. It is available on the PDP-11/34/35/40/45/50/55/60/70. This unit maps a task's virtual address (0-32K words) into a physical memory address (0-124K words except on the PDP-11/70, which may be expanded to 1920K words).

On an unmapped system, tasks must be linked to the physical base address of the partition in which they run; however, in a mapped system, all tasks are mapped with the KT11, and the virtual base address of the task is usually zero. To run a task built for an unmapped system in a partition with a different base address, the task must be rebuilt to link it to the physical base address of the new partition. This is not necessary on a mapped system, because the physical base address of the partition is determined by the KT11. Thus, any task on a mapped system can be run in any partition large enough to accommodate it, whether or not it is the partition for which the task was built. This affects the SYSGEN procedure, because altering the partitions in an unmapped system can force you to rebuild all the utility tasks, whereas, in a mapped system, this does not happen.



CHAPTER 2
GETTING STARTED

2.1 CONTENTS OF THE DISTRIBUTION KITS

Each RSX-11M V3.1 distribution kit contains a system that can be bootstrapped. This system can run on the minimum configuration for which it is intended. All system components required to run and generate custom tailored systems are included in the kits. We distribute RSX-11M in 11 different kits:

1. Six RK05 disks (single RK05 kit)
2. Five RK05 disks (dual RK05 kit)
3. One RK06 disk
4. Three RL01 disks
5. Six 600-foot 800-BPI tapes containing DSC images of the six RK05 disks in one above
6. Five 600-foot 800-BPI tapes containing DSC images of the five RK05 disks in two above
7. Three 600-foot 800-BPI tapes containing DSC images of an RK06 disk
8. Three 600-foot 800-BPI tapes containing DSC images of three RL01 disks
9. Three 600-foot 800-BPI tapes containing DSC images of an RM03 disk
10. Three 600-foot 800-BPI tapes containing DSC images of an RP02/03 disk
11. Three 600-foot 800-BPI tapes containing DSC images of a RP04/05/06 disk

In addition, all tape kits contain an additional 600-foot, 800-BPI tape with a bootable, stand-alone copy of the Disk Save and Compress (DSC) utility.

2.1.1 Single RK05 Release Kits - Summary

2.1.1.1 Summary of Single RK05 Disk Release Kit Contents - The distribution kit contains six RK05 disk cartridges identified as:

1. Executive source Disk - EXCSRC1

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2. Unmapped object Disk - UNMOBJ
3. Mapped object Disk - MAPOBJ
4. MCR source Disk - MCRSRC
5. FCP and DMP source disk - FCPDMP
6. Utility object disk - UTLOBJ1

For generating mapped or unmapped systems, two or three of these disks are used -- the Executive source disk, the applicable object disk, and possibly the utility object disk. If you are building a mapped system, your system must have a minimum of 24K of memory and a Memory Management Unit. The MCRSRC, and FCPDMP source disks are used if you want to modify MCR or FCP. The DMP sources are included as an example of how a typical MCR utility program is written. DMP is on the FCPDMP source disk.

The first phase of SYSGEN uses the Executive source disk.

Among its files are:

1. The Baseline System Executive and loadable drivers
2. A subset of the system tasks
3. Complete source code for the Executive
4. The system generation indirect MCR command files SYSGEN.COMD, SYSGEN0.COMD, SGNEXEC.COMD, SGNPER.COMD, and SGNTT.COMD.

Output files created during the first phase of system generation are generated on the Executive source disk.

The object disk (mapped or unmapped) is used for the second phase of SYSGEN and contains among its files:

1. The Baseline System Executive, loadable drivers, and system tasks. The unmapped object disk contains a 16K unmapped Baseline System and the object libraries for an unmapped MCR and FCP. The mapped object disk contains a 24K mapped Baseline System and the object libraries for a mapped MCR and FCP.
2. Task-build command files to create all privileged system tasks
3. Object library files for all privileged system tasks
4. The system generation indirect MCR command file, SYSGEN2.COMD, SYSGEN2A.COMD, and BLDDRV.COMD

In addition, the following files, created on the Executive source disk during phase 1, are copied to the object disk: the concatenated Executive object file RSX11M.OBJ, the SYSGEN parameter file SGNPARAM.COMD, the Executive task-build command file RSXBLD.COMD, and the ICS/ICR-11 table module ICTAB.MAC. The latter part of SYSGEN creates the user-tailored Executive on the object disk, which ultimately becomes your system disk.

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To obtain a detailed list of the contents of the disks, use the following commands:

```
>RUN $PIP
PIP>DK0:[*,*]/LI
```

This command sequence produces, on the console terminal, a complete directory listing of the volume mounted on DK0:.

2.1.1.2 Summary of Single RK05 Magtape Release Kit Contents - The release kit consists of seven 600-foot, 9-track, 800-BPI magtapes. The magtapes each contain one of six RK05 disk images and a seventh tape contains a stand-alone version of DSC. The six images correspond to the six disks described earlier. The disk images on each magnetic tape are:

1. Executive source tape containing the file EXCSRC1
2. The unmapped object tape containing the file UNMOBJ
3. The mapped object tape containing the file MAPOBJ
4. MCR source tape contains the file MCRSRC
5. FCP and DMP tape containing the file FCPDMP
6. Utility object tape containing the file UTLOBJ1

Before beginning a SYSGEN, you must copy the files that you need from these tapes onto RK05 cartridges using the Disk Save and Compress utility (DSC). Section 2.2.3.5 contains an example of using DSC.

2.1.2 Single RK05 Release Kits - Details

2.1.2.1 Executive Source Disk Contents - The Executive source disk contains the following:

UIC	CONTENTS
[1,1]	System and Executive macro libraries
[1,2]	Error message text file, startup command file
[1,50]	Baseline unmapped Executive and tasks required for SYSGEN
[11,10]	Executive source modules
[11,20]	Directory for unmapped Executive object modules
[11,24]	Directory for mapped Executive object modules
[11,40]	Directory for Executive correction files
[200,200]	SYSGEN0.CMD, SYSGEN.CMD, SGNEXEC.CMD, SGNPER.CMD, SGNTT.CMD and RSXMC.MAC for the baseline system.

The RSX-11M system files distributed on this disk provide a limited number of utility tasks.

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The tasks are:

- BOO - MCR BOOT command
- DMO - MCR DISMOUNT command
- IND - MCR indirect command file processor
- INI - MCR Disk Initialization command
- INS - MCR INSTALL command
- LOA - MCR LOAD command
- MCR - Monitor console routine
- MOU - MCR MOUNT command
- SAV - MCR SAVE command
- TKN - Task termination notification routine
- UFD - MCR User File Directory command
- UNL - MCR UNLOAD command
- FPCNMH - 2K non-multi-header file system
- PIP - Peripheral Interchange Program
- FLX - File exchange program
- BIGMAC - 14K MACRO-11 assembler
- MAC - 8K MACRO-11 assembler
- EDI - Line text editor
- SLP - Source Language Input Program
- VFY - File Structure Verification Program

The partition layout for the system on the source disk is shown in Figure 2-1.

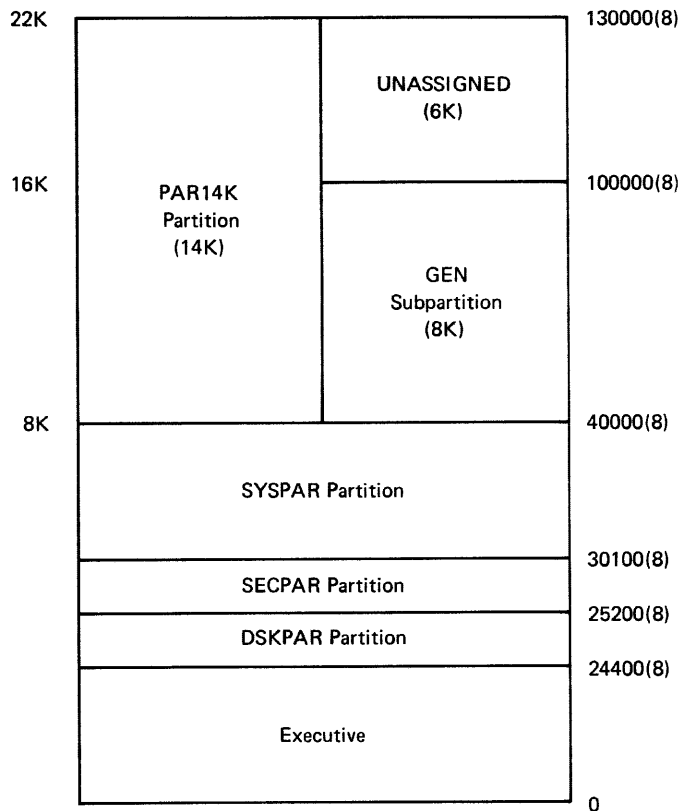


Figure 2-1 Baseline Single RK05 Unmapped System Partition Layout

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This system runs on a processor with 16K of memory or more. The assembler uses the subpartition GEN on 16K systems, and partition PAR14K on systems with at least 22K of memory. If you want Executive listings on a 16K system, two assemblies are recommended -- one to produce the object modules, and one to produce the listings. On systems with more than 16K of memory, this restriction does not exist.

You must not use the PAR14K partition to run tasks on a 16K machine, because it maps into 6K of nonexistent memory. Devices generated into this system are:

2 RK05 drives
1 terminal

In addition, loadable drivers with loadable data bases are provided for the following:

2 TC11/TU56 DEctape drives
2 TA11/TU60 Cassette drives
2 RX11/RX01 Floppy disk drives
2 TM11/TM11/TMB11 - TU10/TS03/TE10 magtape drive
2 RH11/RH70/TM02/03 - TU16/TU45/TE16 magtape drive
1 PC11 Paper Tape punch

2.1.2.2 Unmapped Object Disk Contents - The unmapped object disk contains the following:

UIC	CONTENTS
[1,1]	System object library, Executive symbol definition library, ODT and TRACE object modules; concatenated object module files for the FORTRAN Purdue ISA Routines, and a concatenated object module file containing FCS routines for ANSI magtape support
[1,2]	Error message text file, startup command file
[1,3]	Directory for lost files found by VFY
[1,4]	Directory for Snap-Shot and Post-Mortem Dumps
[1,6]	Directory for Error Log files
[1,20]	Object module libraries, task-build command files, overlay description files for all DEC-supplied privileged tasks, and overlay description and task-build command files for nonprivileged system tasks
[1,30]	Directory for task maps
[1,50]	RSX-11M Baseline System Executive and all DEC-supplied tasks built to run with the Baseline System Executive
[1,60]	Directory for RSX-11S Executive and tasks
[200,200]	SYSGEN2.CMD, BLDDRV.CMD, and SYSGEN2A.CMD command files, and source module for building resident file control services (FCS) and FORTRAN Object Time System (OTS) libraries

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The partition layout and device configuration of the system that is distributed on the unmapped object disk is identical to that of the source disk. Use the unmapped object disk to build a new, unmapped RSX-11M system to your specifications.

2.1.2.3 **Mapped Object Disk Contents** - The mapped object disk contains the following:

UIC	CONTENTS
[1,1]	System object library, Executive symbol definition library, ODT and TRACE object modules, concatenated object module files for the FORTRAN Purdue ISA routines, and a concatenated object module file containing FCS routines for ANSI magtape support
[1,2]	Error message text file, startup command file
[1,3]	Directory for lost files found by VFY
[1,4]	Directory for Snap-Shot and Post-Mortem Dumps
[1,6]	Directory for Error Log files
[1,20]	Object module libraries and overlay descriptor files for all nonprivileged system tasks
[1,24]	Object module libraries and overlay description files for all privileged tasks, task-build command files for all tasks not distributed or built under UIC [1,54]
[1,34]	Directory for task maps
[1,54]	RSX-11M mapped 24K Baseline System Executive and all DEC-supplied tasks built to run with the Executive
[1,64]	Directory for RSX-11S Executive and tasks
[200,200]	SYSGEN2.CMD and BLDDRV.CMD command files, and source module for building resident file control services (FCS) and FORTRAN Object Time System libraries

The device configuration for this system is identical to that of the system on the source disk. The partition layout appears in Figure 2-2.

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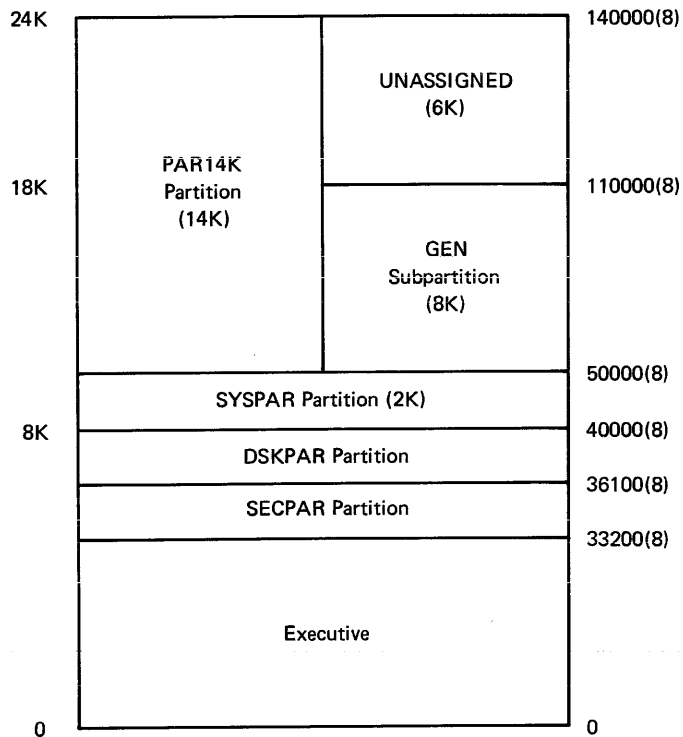


Figure 2-2 Baseline RK05 Mapped System Partition Layout

The minimum configuration supported by the mapped RSX-11M system is 24K words. The partitioning scheme is such that all tasks except BIGMAC and BIGTKB run in partition GEN. BIGMAC and BIGTKB must run in partition PARI4K.

2.1.2.4 MCR Source Disk Contents - The MCR source disk contains the following:

UIC	CONTENTS
[1,1]	System and Executive macro libraries
[1,2]	Error message text file, startup command file
[1,20]	Directory for unmapped MCR library files
[1,24]	Directory for mapped MCR library files
[1,50]	Baseline unmapped Executive and utility tasks
[12,10]	MCR source modules
[12,20]	Unmapped MCR assembly command files and library build file
[12,24]	Mapped MCR assembly command files and library build file

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- [12,30] Directory for unmapped MCR listing files
- [12,34] Directory for mapped MCR listing files
- [12,40] Directory for MCR correction files
- [45,10] K-series lab peripheral support source files
- [45,20] Assembly command files for K-series lab peripheral devices (unmapped)
- [45,24] Assembly command files for K-series lab peripheral devices (mapped)
- [200,200] SGNKLAB.COMD for generation of K-series lab support

The RSX-11M system files distributed on this disk provide a limited number of utility tasks. The utility tasks are identical to those on the Executive source disk.

2.1.2.5 FCP and DMP Source Disk - The FCP and DMP source disk contains the following:

UIC	CONTENTS
[1,1]	System and Executive macro libraries
[1,2]	Error message text file, start up command file
[1,20]	Directory for unmapped FCP library file
[1,24]	Directory for mapped FCP library file
[1,50]	Baseline unmapped Executive and tasks required for SYSGEN
[13,10]	FCP source modules
[13,20]	Unmapped FCP assembly command file
[13,24]	Mapped FCP assembly command file
[13,30]	Directory for unmapped FCP listing files
[13,34]	Directory for mapped FCP listing files
[13,40]	Directory for FCP correction files
[15,10]	Source files for RMDEMO and the task shuffler
[15,20]	Directory for unmapped object modules
[15,24]	Directory for mapped object modules
[15,30]	Directory for unmapped listing files
[15,34]	Directory for mapped listing files
[35,10]	DMP source files
[35,20]	DMP assembly command file
[35,30]	Directory for DMP listing files

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The RSX-11M system files distributed on this disk provide a limited number of utility tasks. The utility tasks are identical to those on the Executive source disk.

2.1.2.6 Utility Object Disk Contents - The utility object disk contains the following:

UIC	CONTENTS
[1,1]	System object library, ANSI magtape FCS concatenated object module, and ODT
[1,2]	Error message file and Startup command file
[1,20]	ODL and build command files for unmapped utility tasks
[1,24]	Build command files for mapped utility tasks
[1,30]	UIC for unmapped map files
[1,34]	UIC for mapped map files
[1,50]	Baseline unmapped Executive and tasks required for SYSGEN
[1,54]	UIC for mapped task files
[200,200]	SYSGEN3.CMD and BLDUMD.CMD command files to build utility tasks and user mode diagnostic tasks.

2.1.2.7 Device Combinations Supported by the Single RK05 Distribution Kits - The following list contains the valid combinations of devices for use in generating a target system. You must have one of the following combinations to successfully complete a system generation with the single RK05 kits:

1. RK05 disk and TAll cassette (working storage)
2. RK05 disk and TU56 DEctape (working storage)
3. RK05 disk and RX01 floppy disk (working storage)
4. RK05 disk and TU10, TE10 or TS03 magtape (working storage)
5. RK05 disk and TU16, TE16, or TU45 magtape (working storage)
6. Two RK05 disks (source and object disk simultaneously mounted)

2.1.3 Dual RK05 Release Kits - Summary

2.1.3.1 Summary of Dual RK05 Disk Release Kit Contents - The distribution kit contains five RK05 disk cartridges identified as:

1. Baseline System Disk - BASLINE

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2. Executive Source Disk - EXECSRC
3. User-tailored System Disk - SYSTEM
4. Utility Object Disk - UTILOBJ
5. MCR/FCP Source Disk - MCRFCP

For a given system generation type, mapped or unmapped system, three of these disks are used: the Baseline system disk; the Executive source disk; and the User-tailored system disk. The Utility object disk is used if the non-privileged utility tasks are to be built. The MCR source disk is used if the user wishes to modify MCR or FCP.

The dual RK05 distribution kit requires 24K words of memory and either one RK05 removable platter drive and one RK05F fixed platter drive, or two RK05 removable platter drives.

The Baseline system disk (BASLINE), and the Executive source disk (EXECSRC), are used during the first phase of system generation.

Among the files on the BASLINE disk are:

1. The mapped and unmapped Baseline system Executive.
2. The system tasks
3. The system generation indirect command files PRESYSGEN.COMD, PRESGN1.COMD, PRESGN2.COMD, SGNXFER.COMD, and SGNXFER2.COMD.

Among the files on the EXECSRC disk are:

1. The system generation indirect command file, SYSGEN.COMD, the three query files SGNEXEC, SGNPER, and SGNTT, and SGNKLAB.COMD.

Output files created during the first phase of system generation are generated on the EXECSRC disk and then copied to the BASLINE disk.

2.1.3.2 Summary of Dual RK05 Magtape Release Kit Contents - The release kit consists of five 600-foot, 9-track, 800 BPI magnetic tapes. The magtapes contain five RK05 disk images. Also included, is a tape containing a stand-alone version of DSC. The five images correspond to the five disks described in Section 2.1.3.1.

The five magtapes are:

1. Baseline system tape containing the file BASLINE
2. Executive source tape containing the file EXECSRC
3. User-tailored system tape containing the file SYSTEM
4. Utility object tape containing the file UTILOBJ
5. MCR/FCP source tape containing the file MCRFCP

Before beginning a SYSGEN, the appropriate files must be copied onto RK05 cartridges using the Disk Save and Compress Utility (DSC). This procedure is described later in this Chapter.

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2.1.4 Dual RK05 Release Kits - Details -

2.1.4.1 Baseline System Disk (BASLINE) Contents - The Baseline system disk contains the following:

UIC	Contents
[1,1]	System libraries and the virtual memory workfile library
[1,2]	Error message text and the startup command file
[1,50]	Unmapped Baseline Executive and system tasks
[1,54]	Mapped Baseline Executive and system tasks
[200,200]	PRESYSGEN.CMD, PRESGN1.CMD, PRESGN2.CMD, SGNXFER.CMD, SGNXFER2.CMD, and COPYTSK.CMD

The RSX-11M system that is distributed on this disk provides all of the utility tasks.

The tasks contained on the BASLINE disk are:

BAD	- Bad block locator routine
BIGMAC	- 14K Macro-11 assembler
BIGTKB	- 14K Task builder (RSX-11M Linker)
BOO	- MCR Boot command
CDA	- Crash dump analyzer
CMP	- Routine to compare ASCII source files
DMO	- MCR Dismount command
DMP	- File dump routine
EDI	- Line text editor
FCPNMH	- 2K non-multi-header file system
FLX	- File transfer routine
IND	- Indirect command file processor
INI	- MCR Disk Initialization command
INS	- MCR Install command
LBR	- Library files maintenance and creation routine
LOA	- MCR Load command
MAC	- 8K Macro-11 assembler
MCR	- Monitor console routine
MOU	- MCR Mount command
PAT	- Object module patch routine
PIP	- Peripheral interchange program
SAV	- MCR Save command
SLP	- Source language input program
TKB	- 8K task builder
TKN	- Task termination notification routine
UFD	- MCR User File Directory command
UNL	- MCR Unload command
VFY	- File structure verification routine
VMR	- Virtual monitor console routine
ZAP	- Task image and data files patch routine

Devices generated into this system are:

4 RK05 disk drives
1 terminal

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In addition, loadable drivers and data bases are provided for the following:

- 2 TAll cassette drives
- 2 TU56 DEctape drives
- 2 RX01 floppy disk drives
- 1 TE/TU10 or TS03 magtape drive
- 1 TE/TU16 or TU45 magtape drive
- 1 LP11 or LS11 line printer
- 1 PC11 paper tape punch

2.1.4.2 **Executive Source Disk (EXECSRC) Contents** - The Executive source disk contains the following:

UIC	Contents
[11,10]	The Executive source files
[45,10]	K-series lab peripheral support sources
[45,20]	Assembly command files for K-series lab peripherals on an unmapped system
[45,24]	Assembly command files for K-series lab peripherals on a mapped system
[200,200]	SGNEXEC.CMD, SGNTT.CMD, SGNPER.CMD, SYSGEN.CMD, SYSGEN0.CMD, SGNKLAB.CMD

2.1.4.3 **Utility Object Disk (UTILOBJ) Contents** - The utility object disk contains the following:

UIC	Contents
[1,1]	System libraries
[1,2]	Error message text and the startup command file
[1,20]	Object module libraries, task build command files for unmapped systems
[1,24]	Task build command files for mapped systems
[200,200]	SYSGEN3.CMD and BLDUMD.CMD

2.1.4.4 **User-tailored System Disk (SYSTEM) Contents** - The User-tailored system disk contains the following:

UIC	Contents
[1,1]	System libraries, Executive symbol definition library, ODT and TRACE object modules, concatenated object module files for the Purdue ICS/ISA/UDC routines, virtual memory workfile library, and a concatenated object module file containing FCS routines for ANSI magtape support
[1,2]	Error message text and the startup command file

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- [1,20] Build command files for the system tasks on an unmapped system
- [1,24] Build command files for the system tasks on a mapped system
- [200,200] Assembly files for FCS ANSI magtape support, SYSGEN2.CMD, 11SGEN.CMD, BLDDRV.CMD, and SYSGEN2A.CMD

2.1.4.5 **MCRFCP Source Disk (MCRFCP) Contents** - The MCR source disk contains the following:

UIC	Contents
[1,1]	The Executive macro library
[1,20]	The build command files for RMDEMO on an unmapped system
[1,24]	The build command files for RMDEMO and the shuffler (SHF) on a mapped system
[12,10]	Sources for MCR
[12,20]	MCR assembly command files for an unmapped system
[12,24]	MCR assembly command files for a mapped system
[13,10]	Sources for FCP
[13,20]	FCP assembly command file for an unmapped system
[13,24]	FCP assembly command file for a mapped system
[15,10]	Sources for RMDEMO and the task shuffler SHF

2.1.4.6 **Device Combinations Supported by Dual RK05** - The following is a list of the valid device combinations for use in generating a target system. One of these combinations is required when using the dual RK05 distribution kit.

1. An RK05 removable platter disk drive and an RK05F fixed platter disk drive
2. Two RK05 removable platter disk drives

2.1.5 RL01 Kits - Summary

2.1.5.1 **Summary of RL01 Disk Release Kit Contents** - The distribution kit contains three RL01 disk cartridges identified as:

1. Mapped system object disk - MAPSYS
2. Unmapped system object disk - UNMSYS
3. Utility object disk - RLUTIL

GETTING STARTED

For a given system generation type, mapped or unmapped system, one or two of these disks are used -- the applicable system object disk and, if any of the utilities are to be rebuilt, the utility object disk.

The system object disks are used during the first two phases of SYSGEN.

Among the files on these disks are:

1. The Baseline System Executive and loadable drivers
2. The System tasks
3. Complete source code for the Executive
4. The system generation indirect MCR command files SYSGEN.CMD, SYSGEN0.CMD, SGNEXEC.CMD, SGNPER.CMD, SGNTT.CMD, SYSGEN2.CMD, llSGEN.CMD, and BLDDRV.CMD

2.1.5.2 Summary of RL01 Magtape Release Kit Contents - The release kit consists of three 600-foot, 9-track, 800-BPI magtapes. The magtapes contain three RL01 disk images. Also included, is a tape containing a stand-alone version of DSC. The three images correspond to the three disks described in Section 2.1.5.1. The three magtapes are:

1. Mapped system object disk - MAPSYS
2. Unmapped system object disk - UNMSYS
3. Utility object disk - RLUTIL

Before beginning a SYSGEN, the appropriate files must be copied onto RL01 cartridges using the Disk Save and Compress Utility (DSC). This procedure is described in Section 2.2.3.5.

2.1.6 RL01 Release Kits - Details

2.1.6.1 Mapped System Object Disk (MAPSYS) - The object disk for generating a mapped system contains the following:

UIC	Contents
[1,1]	Executive and system macro libraries, virtual memory workfile library, FORTRAN Purdue ICR/ICS/UDC routines object modules, ANSI magtape FCS concatenated object module, and ODT and TRACE debugging aids.
[1,2]	System error message file and the startup command file.
[1,24]	Mapped system tasks object module libraries and mapped system task-build command files.
[1,54]	Utility tasks

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- [11,10] All system-supplied tasks and loadable drivers built to run with this Executive.
- [200,200] The system generation indirect MCR command files SYSGEN.COMD, SYSGEN0.COMD, SGNEXEC.COMD, SGNPER.COMD, SGNITT.COMD, SYSGEN2.COMD, and 11SGEN.COMD.

The RSX-11M system that is distributed on this disk provides all of the utility tasks.

The tasks contained on the MAPSYS disk are:

BAD	- Bad block locator routine
BIGMAC	- 14K Macro-11 assembler
BIGTKB	- 14K Task builder (RSX-11M Linker)
BOO	- MCR Boot command
CDA	- Crash dump analyzer
CMP	- Routine to compare ASCII source files
DMO	- MCR Dismount command
EDI	- Line text editor
FCPNMH	- 2K non-multi-header file system
FLX	- File transfer routine
IND	- Indirect command file processor
INI	- MCR Disk Initializaiton command
INS	- MCR Install command
LBR	- Library file, maintenance and creation routine
LOA	- MCR Load command
MAC	- 8K Macro-11 assembler
MCR	- Monitor console routine
MOU	- MCR Mount command
PAT	- Object module patch routine
PIP	- Peripheral interchange program
SAV	- MCR Save command
SLP	- Source language input program
TKB	- 8K task builder
TKN	- Task termination notification routine
UFD	- MCR User File Directory command
UNL	- MCR Unload command
VFY	- File structure verification routine
VMR	- Virtual monitor console routine
ZAP	- Task image and data files patch routine

Devices generated into this system are:

2 RL01 disk drives
1 terminal

In addition, loadable drivers and data bases are provided for the following:

2 TAll cassette drives
2 TU56 DECTape drives
2 RX01 floppy disk drives
1 TU10 or TS03 magtape drive
1 TU16 or TU45 magtape drive
1 LP11 or LS11 line printer
1 PC11 paper tape punch

GETTING STARTED

2.1.6.2 Unmapped System Object Disk (UNMSYS) - The object disk for generating an unmapped system contains the following:

UIC	Contents
[1,1]	Executive and system macro libraries, virtual memory workfile library, FORTRAN Purdue ICR/ICS/UDC routines object modules, ANSI magtape FCS concatenated object module, and ODT and TRACE debugging aids.
[1,2]	System error message file and the startup command file.
[1,20]	Unmapped system tasks object module libraries and unmapped system task-build command files.
[1,50]	Utility tasks
[11,10]	All system-supplied tasks and loadable drivers built to run with this Executive.
[200,200]	The system generation indirect MCR command files SYSGEN.CMD, SYSGEN0.CMD, SGNEXEC.CMD, SGNPER.CMD, SGNTT.CMD, SYSGEN2.CMD, and 11SGEN.CMD.

The RSX-11M system that is distributed on this disk provides all of the utility tasks.

The tasks contained on the UNMSYS disk are:

BAD	- Bad block locator routine
BIGMAC	- 14K Macro-11 assembler
BIGTKB	- 14K Task builder (RSX-11M Linker)
BOO	- MCR Boot command
CDA	- Crash dump analyzer
CMP	- Routine to compare ASCII source files
DMO	- MCR Dismount command
DMP	- File dump routine
EDI	- Line text editor
FCPNMH	- 2K non-multi-header file system
FLX	- File transfer routine
IND	- Indirect command file processor
INI	- MCR Disk Initialization command
INS	- MCR Install command
LBR	- Library files maintenance and creation routine
LOA	- MCR Load command
MAC	- 8K Macro-11 assembler
MCR	- Monitor console routine
MOU	- MCR Mount command
PAT	- Object module patch routine
PIP	- Peripheral interchange program
SAV	- MCR Save command
SLP	- Source language input program
TKB	- 8K task builder
TKN	- Task termination notification routine
UFD	- MCR User File Directory command
UNL	- MCR Unload command
VFY	- File structure verification routine
VMR	- Virtual monitor console routine
ZAP	- Task image and data files patch routine

Devices generated into this system are:

2 RL01 disk drives
1 Terminal

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In addition, loadable drivers and data bases are provided for the following:

- 2 TA11 cassette drives
- 2 TU56 DEctape drives
- 2 RX01 floppy disk drives
- 1 TU10 or TS03 magtape drive
- 1 TU16 or TU45 magtape drive
- 1 LP11 or LS11 line printer
- 1 PC11 paper tape punch

2.1.6.3 Utility Object Disk (RLUTIL) - The utility object disk contains the following:

UIC	Contents
[1,1]	Exeuctive and system macro libraries, virtual memory workfile library, ANSI magtape FCS concatenated object module, and ODT and TRACE debugging aids.
[1,2]	System error message file and the startup command file.
[1,20]	Task-build command files.
[1,50]	Baseline Executive and system tasks.
[12,10]	MCR source modules.
[13,10]	FCP source modules.
[15,10]	Source files for RMDEMO and the task shuffler.
[35,10]	DMP source files.
[45,10]	Source files for the K-series laboratory peripherals.
[45,20]	Build command files for K-series laboratory peripherals on an unmapped system.
[45,24]	Build command files for K-series laboratory peripherals on a mapped system.
[200,200]	System generation indirect MCR command files SYSGEN3.COMD and BLDUMD.COMD.

2.1.7 RP02/03, RP04/05/06, RM03 and RK06 Magtape Release Kit

The RP02/03, RP04/05/06, and RK06 magtape release kits consist of four magtapes. Three tapes contain the saved image of the disk contents and the fourth tape contains a bootable, stand-alone version of the Disk Save and Compress utility (DSC) that copies the tape to disk. Each disk image contains a running unmapped and mapped Executive and all tasks. The unmapped Executive is bootstrapped automatically by the hardware bootstrap. In addition to the two systems, the disks contain all of the files necessary to build a target system as well as the source for the Executive, MCR, FCP, DMP, RMDEMO, and the shuffler task. You can generate a mapped or unmapped system while running either the unmapped or mapped Executive. The only difference between the kits is that each has the appropriate disk driver for the disk it is to run on.

GETTING STARTED

2.1.7.1 RP02/03, RP04/05/06, RM03, and RK06 Magtape Release Kit Contents - The disk images in the magtape release kits contain the following:

UIC	CONTENTS
[1,1]	Executive and system macro libraries, the virtual memory workfile library, system object library, Executive symbol definition library, FORTRAN Purdue ISA routine object modules, ANSI magtape FCS concatenated object module, and ODT and TRACE debugging aids
[1,2]	SYSGEN text file, system error message file, startup command file
[1,3]	Directory for lost files found by VFY
[1,4]	Directory for Snap Shot and Post-Mortem Dumps
[1,6]	Directory for Error Log files
[1,20]	Unmapped system privileged task object module libraries, nonprivileged task object module libraries, and unmapped system task-build command and overlay descriptor files
[1,24]	Mapped system privileged task object module libraries, and mapped system task-build command and overlay descriptor files
[1,30]	Directory for unmapped system task build maps
[1,34]	Directory for mapped system task-build maps
[1,50]	RSX-11M unmapped Baseline System Executive and all system-supplied tasks and loadable drivers built to run with this Executive
[1,54]	RSX-11M mapped Baseline System Executive and all system-supplied tasks and loadable drivers built to run with this Executive
[1,60]	Directory for unmapped RSX-11S Executive and tasks
[1,64]	Directory for mapped RSX-11S Executive and tasks
[11,10]	Executive source files
[11,20]	Directory for unmapped Executive object files
[11,24]	Directory for mapped Executive object files
[11,30]	Directory for unmapped Executive listing files
[11,34]	Directory for mapped Executive listing files
[11,40]	Directory for Executive source correction files
[12,10]	MCR source files
[12,20]	Unmapped MCR assembly command files and object library build command file

GETTING STARTED

- [12,24] Mapped MCR assembly command files and object module library build command file
- [12,30] Directory for unmapped MCR listing files
- [12,34] Directory for mapped MCR listing files
- [12,40] Directory for MCR correction files
- [13,10] FCP source files
- [13,20] Unmapped FCP assembly command file
- [13,24] Mapped FCP assembly command file
- [13,30] Directory for unmapped FCP listing files
- [13,34] Directory for mapped FCP listing files
- [13,40] Directory for FCS correction files
- [15,10] Source files for RMDEMO system display task and the shuffler
- [15,20] Directory for unmapped RMDEMO and shuffler object files
- [15,24] Directory for mapped RMDEMO and shuffler object files
- [15,30] Directory for unmapped RMDEMO and shuffler listing files
- [15,34] Directory for mapped RMDEMO and shuffler listing files
- [35,10] DMP source files
- [35,20] DMP assembly command file
- [35,30] Directory for DMP listing files
- [45,10] K-series lab peripheral support source files
- [45,20] Assembly command files for K-series lab peripheral devices (unmapped)
- [45,24] Assembly command files for K-series lab peripheral devices (mapped)
- [200,200] SYSGEN command files, FCS and FORTRAN Object Time System (OTS) resident library files, and SGNKLAB.COMD file for generating K-series lab support

The devices generated into the system for this kit are:

- 2 RP02/03, RP04/05/06 or RK06 disk drives
- 1 terminal

GETTING STARTED

In addition, loadable drivers with loadable data bases are supplied for the following devices:

- 2 TAll/TU60 cassette drives
- 2 TC11/TU56 DECTape drives
- 2 RX11/RX01 floppy disk drives
- 2 TU10, TE10, or TS03 magtape drive or
- 1 TU16, TE16, or TU45 magtape drive
- 1 LP11 line printer
- 1 PC11 paper tape punch

The partition layouts for the unmapped and mapped systems are identical to those for the RK05 distribution disks. Both the mapped and unmapped Executives are supplied with copies of all the system tasks.

2.2 SAVING DISTRIBUTION DISKS

2.2.1 Saving the Single and Dual RK05 Distribution Disks

Because the distribution disks are actively manipulated during the generation of a user-tailored system, you must back up the disks prior to their actual use in system generation. To allow preserving RK05 disks on cassette, DECTape or floppy disk, DIGITAL provides a stand-alone utility called the Volume Preservation Program (PRESRV). To save RK05 disks on magtape or RK05 disk, DIGITAL provides the utility DSC (disk save and compress) as a stand-alone system and also as an object library to be built as a task. Both PRESRV and DSC are described in separate manuals.

You must always save the object disk on which the system is to be generated, because the target system will replace the Baseline System on that disk. (It is also good practice to save the Executive source disk, as well as the MCR, FCP and DMP, and utility object disks.)

Before saving the single RK05 release disks, you should verify that they can be read on your disk drives. You can do this by using the read-check option of the VFY program, which is available on all disks. After bootstrapping a disk, run VFY and specify the /RC (read-check) switch. If any blocks are unreadable, VFY reports them. VFY is described in the RSX-11 Utilities Procedures Manual. If a disk is unreadable, call the local DIGITAL Software Support Specialist for assistance.

A minimum RK05 system must include one of the following sets of peripheral devices:

1. An RK05 disk and a dual TU56 DECTape unit,
2. An RK05 disk and a dual TAll cassette tape unit,
3. Dual RK05 units,
4. An RK05 and an RX01 floppy disk, or
5. An RK05 disk and a TU10, TU16, TU45, TE10, TE16, or TS03 magtape drive.

GETTING STARTED

To save the disks in the distribution kit, follow the appropriate procedure described in Section 2.3 to bootstrap the unmapped object disk. Then, use the MCR BOOT command to bootstrap DSC or PRESRV. The full sequence is described below.

Bootstrapping the system -- the following display results:

```
RSX11M V03.1 BL22 16K
>RED DK0:=SY0:
>RED DK0:=LB0:
>MOU SY0:UNMOBJ
>@STARTUP
*PLEASE ENTER TIME AND DATE (HR:MN DD-MMM-YY) [S]:
>TIM hrs:mins[:secs][mnth/day/year]
>@<EOF>
>INS [1,50]BOO
```

Bootstrapping DSC using the following MCR command:

```
>BOO [1,50]DSCSYS
```

DSC is bootstrapped and the following display occurs:

```
DSC>RSX-11S V02.1 BL22 DISK SAVE AND COMPRESS UTILITY
```

Bootstrapping PRESRV using the following MCR commands:

```
>BOO [1,50]PRESRV
```

PRESRV is bootstrapped and the following display occurs:

```
RSX-11S V02.1 BL22
VOLUME PRESERVATION PROGRAM - V02.5
FOR HELP TYPE /HE
nn. - BLOCKS AVAILABLE FOR BUFFERING
```

```
PRE>
```

indicating that the PRESRV program is ready for input. The message nn. - BLOCKS AVAILABLE FOR BUFFERING indicates how many 256-word blocks are available for buffering.

Depending on the specific backup medium you use (cassette, DECTape, RK05 disk, or magtape), you should select one of the following procedures to back up the contents of the RK05 disk.

2.2.1.1 Preserving an RK05 on DECTape:

To backup an RK05 on DECTape, use the following PRESRV command lines:

```
PRE>DT0:label/BL:1/VE=DK0:/BL:1 (16K machines)
```

```
PRE>DT0:label/BL:4/VE=DK0:/BL:4 (all others)
```

where label is the name to be given to the file on DECTape.

GETTING STARTED

2.2.1.2 Preserving an RK05 on Cassette:

To back up an RK05 on a cassette, use the following PRESRV command lines:

```
PRE>CT0:label/BL:1/VE=DK0:/BL:1          (16K machines)
```

```
PRE>CT0:label/BL:3/VE=DK0:/BL:3          (all others)
```

where label is the name to be given to the file on the cassette.

2.2.1.3 Saving an RK05 on an RK05:

To back up an RK05 on an RK05, use the following DSC command line:

```
DSC>DK1:/VE=DK0:
```

2.2.1.4 Preserving an RK05 on Floppy Disk:

To back up an RK05 on a floppy disk, use the following PRESRV command lines:

```
PRE>DX0:label/BL:1/VE=DK0:/BL:1          (16K machines)
```

```
PRE>DX0:label/BL:6./VE=DK0/BL:12.        (all others)
```

where label is the name given to the file on the floppy disk.

2.2.1.5 Saving an RK05 on Magtape:

To back up an RK05 on a magnetic tape, use the following DSC command lines:

```
DSC>MT0:/VEC=224                          (TU10, TE10, and TS03)
```

```
DSC>MT0:/VE=DK0:
```

```
DSC>MM0:/VE=DK0:                          (TU16, TE16, and TU45)
```

NOTE

The following table shows the assignment of interrupt vectors in DSC to specific devices either by default, or by explicit use of the /VEC switch:

Interrupt Vector	Default Devices	Must Specify by /VEC
224	TU16/TE16/TU45	TU10/TE10/TS03
254	RP04/05/06	RM03, RP02/03

GETTING STARTED

The first DECTape, cassette, or floppy disk that you use to preserve a volume contains a bootstrappable image of PRESRV; thus, if the system disk is inadvertently destroyed, you can restore it by bootstrapping from the first tape created. Such bootstrapping automatically initiates PRESRV, which you can then use to restore the original disk contents.

You can put DSC onto a magtape or DECTape by using the VMR SAV command and thus make it available to single disk systems.

For example, the following procedure copies DSC to a bootable magtape:

```
>ASN XXn:=LB:
>ASN XXn:=SY:
>SET /UIC=[1,50]
>LOA MT:
>RUN $VMR
ENTER FILE NAME:DSCSYS
VMR>SAV MT:DSCSYS
VMR>^Z
>
```

2.2.2 Saving the RP02/03, RP04/05/06, RK05/06, RL01, and RM03 Distribution Kits

These distribution kits are on 600-foot, 9-track, 800-BPI magtapes and therefore, are already saved. To create a disk, you must copy the disk image file from tape to the disk by using DSC. The first step is to select the DSC tape, mount it on the drive, and boot in the stand-alone version of DSC. The first tape is then mounted on tape drive zero. Following this, the disk is mounted on disk drive zero and allowed to reach operating speed.

The command strings shown below copy the disk image from tape to disk.

For RP02 and RP03 disks:

```
DSC>DP:/VEC=254 (TU10, TE10, and TS01)
DSC>MT0:/VEC=224
DSC>DP:/VE=MT0:
```

```
DSC>DP:/VEC=254 (TU16, TE16, and TU45)
DSC>DP:/VE=MM0:
```

For RP04/05/06 disks:

```
DSC>MT:/VEC=224 (TU10, TE10, and TS03)
DSC>DB:/VE=MT0:
```

```
DSC>DB:/VE=MM0: (TU16, TE16, and TU45)
```

For RK05 disks:

```
DSC>MT0:/VEC=224 (TU10, TE10, and TS01)
DSC>DK0:/VE=MT0:
```

```
DSC>DK0:/VE=MM0: (TU16, TE16, and TU45)
```

GETTING STARTED

For RK06 disks:

```
DSC>MT:/VEC=224          (TU10, TE10, and TS02)
DSC>DM:/VE=MT0:
DSC>DM:/VE=MM0:         (TU16, TE16, and TU45)
```

For RL01 disks:

```
DSC>MT0:/VEC=224        (TU10, TE10, and TS01)
DSC>DL0:/VE=MT0:
DSC>DL0:/VE=MM0:       (TU16, TE16, and TU45)
```

For RM03 disks:

```
DSC>MT:/VEC=224
DSC>DR:/VEC=254
DSC>DR:/VE=MT0:        (TU10, TE10, and TS03)
DSC>DR:/VEC=254
DSC>DR:/VE=MM0:       (TU16, TE16, and TU45)
```

2.2.3 Restoring Damaged Volumes

If the system disk is destroyed on a single RK05 system, it must be re-created by means of a backup that has been created by PRESRV or DSC. Bootstrapping a tape backup created via PRESRV produces the following console display:

```
RSX-11S V02.1 BL22
VOLUME PRESERVATION PROGRAM - V02.4
FOR HELP TYPE /HE
nn. - BLOCKS AVAILABLE FOR BUFFERING
```

PRE>

PRESRV is now ready to accept commands. To restore the contents of a disk from cassette, DECTape or floppy disk, assuming the disk and backups are mounted on unit 0 of their respective controllers. You should then enter the appropriate commands given in sections 2.2.3.1 through 2.2.3.5.

2.2.3.1 Cassette Restoration

```
PRE>DK0:/VE/BL:l/FO=CT0:label      (16K machines)
PRE>DK0:/VE/FO=CT0:label           (all others)
```

where label is the name that was specified when the disk was preserved on the cassette. Cassette bootstrapping without a cassette ROM bootstrap requires an extensive key-in procedure via the console switch register.

On an 11/05/10/20/34/35/40/45/50/55/60/70, the key-in procedure is:

1. Press HALT.
2. Enter the address 001000 in the console switch register and press LOAD ADRS.

GETTING STARTED

3. Enter the first value from the right-hand column of the table below in the console switch register; lift the DEP switch.
4. Enter the next value from the right-hand column of the table in the console switch register; lift the DEP switch.
5. Repeat Step 4 for the remaining 26 values in the table.
6. Enter the address 001000 in the console switch register and press LOAD ADRS.
7. Lift the HALT switch.
8. Press START.

At this point, the cassette is bootstrapped and PRESRV displays its initial message and prompt.

ADDRESS	VALUE	ADDRESS	VALUE
001000	012700	001034	100772
001002	177500	001036	116012
001004	005010	001040	000002
001006	010701	001042	120337
001010	062701	001044	000000
001012	000052	001046	001767
001014	012702	001050	000000
001016	000375	001052	000755
001020	112103	001054	005710
001022	112110	001056	100774
001024	100413	001060	005007
001026	130310	001062	017640
001030	001776	001064	002415
001032	105202	001066	112024

2.2.3.2 DECTape Restoration

PRE>DK0:/VE/BL:1/FO=DT0:label/TP (16K machines)

PRE>DK0:/VE/FO=DT0:label/TP (all others)

where label is the name that was specified when the disk was preserved to DECTape.

2.2.3.3 Floppy Disk-to-RK Disk Restoration

PRE>DK0:/VE/FO/BL:1.=DX0:label/TP (16K machines)

PRE>DK0:/VE/FO/BL:12.=DX0:label/TP (all others)

where label is the name that was specified when the disk was preserved to floppy disk.

GETTING STARTED

2.2.3.4 Restoring Damaged Disks with DSC - Mount the tape with the bootable image of DSC on unit zero of the appropriate controller and boot it with the bootstrap ROM. When DSC is loaded, it displays the following:

RSX-11S V02.1 BL22 DISK SAVE AND COMPRESS UTILITY

DSC>

It is now ready to accept commands.

Disk to disk restoration:

```
DSC>DK1:/VE=DK0:                (RK05)
DSC>DM1:/VE=DM0:                (RK06)
DSC>DP:/VEC=254                 (RP02/03)
DSC>DP1:/VEC=254
DSC>DP1:/VE=DP0:
DSC>DB1:/VE=DB0:                (RP04/05/06)
DSC>DL1:/VE=DL0:
DSC>DR:/VEC=254
DSC>DR1:/VEC=254
DSC>DR1:/VE=DR0:
```

Magtape restoration: (TU10/TE10/TS03)

```
DSC>MT:/VEC=224                 (setup vector for MT:)
DSC>DK0:/VE=MT0:               (RK05)
DSC>DM0:/VE=MT0:               (RK06)
DSC>DP:/VEC=254                 (RP02/03)
DSC>DP0:/VE=MT0:
DSC>DB0:/VE=MT0:               (RP04/05/06)
DSC>DR0:/VEC=254
DSC>DR0:/VE=MT0:
```

Magtape restoration: (TU16/TE16/TU45)

```
DSC>DK0:/VE=MM0:               (RK05)
DSK>DM0:/VE=MM0:               (RK06)
DSC>DP:/VEC=254                 (RP02/03)
DSC>DP:/VE=MM0:
DSC>DB:/VE=MM0:                 (RP04/05/06)
```

It is advisable to create a backup disk. In the event that inadvertent destruction of a system disk occurs, a backup is available and you can create an additional backup at will.

On systems with more than one disk unit, where disks are the normal backup medium, you can restore damaged system disks by copying the existing backup disk.

GETTING STARTED

2.2.4 Exiting from PRESRV or DSC

Because PRESRV and DSC are stand-alone programs, the only way to exit from them is to bootstrap in a new system or stand-alone program.

2.2.5 Formatting Disks

Formatted disks are required to restore or create a disk copy of the saved distribution kit disks. RK05, RP02/03, and RP04/05/06 disks that have never been used, require formatting before any data can be written on them. RK06 disks are pre-formatted at the factory and should not be formatted at the customer site. Formatting a disk causes timing and addressing information to be recorded on the disk. This is done by using the stand-alone PRESRV program. The command lines given in Section 2.2.3 include the switch /FO, which indicates that a format pass should be made before copying the backup to the disk. This ensures that all data is readable on the disk. For additional information see the PDP-11 Volume Preservation (PRESRV) User's Guide. You may also use the User Mode Diagnostics in an on-line system to format the disks.

2.3 BOOTSTRAPPING THE BASELINE SYSTEM

The procedure for bootstrapping depends on which hardware bootstrap is present on the host processor. On processors with a programmer console, the operator must first halt the processor by pressing the HALT key, set the console switches to the hardware bootstrap ROM address, press the LOAD ADRS key, and then press the START key. The RSX-11M system message is then displayed at the console terminal. The step-by-step procedure is carried out as described in section 2.3.1, 2.3.2, or 2.3.3. On an 11/04/34 processors having the M9301-YA/YB ROM, and those processors with the M9301-YF ROM the operator must press the BOOT button and enter (via the console terminal) the device name and unit number of the peripheral device from which the bootstrap is to occur. The step-by-step procedure is described in section 2.3.4.

2.3.1 Start-up Using the BM792-YB Bootstrap ROM

1. Press HALT.
2. Set the console switches to 173100.
3. Press LOAD ADRS.
4. Enter the address of the load device in the console switches:

RK11 disk	177406
RP11 disk	176716
TC11 DEctape	177344
5. Lift up the HALT key.
6. Press START.

The start-up sequence shown in section 2.4 is then displayed on the console terminal.

GETTING STARTED

2.3.2 Start-up Using the MR11-DB Bootstrap ROM

1. Press HALT.
2. Enter the address of the load device in the console switches:

RK11 disk	173110
TC11 DEctape	173120
TM11 magtape	173136
RP11 disk	173154
3. Press LOAD ADRS.
4. Lift up the HALT key.
5. Press START.

The start-up sequence shown in section 2.4 is then displayed on the console terminal.

2.3.3 Start-up Using the BM873-YA Bootstrap ROM

1. Press HALT.
2. Enter the address of the load device in the console switches:

RK11 disk	173010
TC11 DEctape	173030
TM11 magtape	173050
RP11 disk	173100
RC11 disk	173144
KL11/DL11	173210
TA11 cassette	173230
PC11 papertape	173312
3. Press LOAD ADRS.
4. Lift up the HALT key.
5. Press START.

The start-up sequence shown in section 2.4 is then displayed on the console terminal.

GETTING STARTED

2.3.4 Start-up Using the BM873-YB Bootstrap ROM

1. Press HALT.
2. Enter the address of the load device in the console switches:

RK11 disk (unit 0)	173030
RK11 disk (unit in switch register)	173032
TC11 DECTape (unit 0)	173070
TM11/TMA11 magtape (unit 0)	173110
RF11 disk	173136
RH11/RH70/TM02/TU16 magtape (unit 0)	173150
RC11 disk	173212
RH11/RH70 device combination (unit 0)	173230
RH11/RH70 device combination (unit in switch register)	173232
RH11/RH70/RP04 disk (unit 0)	173320
RH11/RH70/RP04 disk (unit in switch register)	173322
RP11/RP02/RP03 disk (unit 0)	173350
RP11/RP02/RP03 disk (unit in switch register)	173352
KL11/DL11 console terminal reader	173510
TA11 cassette (unit 0)	173524
TA11 cassette (unit in switch register)	173526
PC11 papertape reader	173620
3. Press LOAD ADRS. (For units other than zero, enter unit number in switch register.)
4. Lift up the HALT key.
5. Press START.

The start-up sequence shown in section 2.4 is then displayed on the console terminal.

GETTING STARTED

0110 RH70/TM02/TU16/TE16/TU45 Magnetic Tape
0111 RH70/RP04/RP05/RP06 Disk Pack
10 RH70/RS04/RS03 Fixed Head Disk

6. Ensure that switches 7 through 21 are off (down).
7. Press START.

The system then displays on the console terminal the start-up sequence described in Section 2.4.

Before the M9301-YC bootstrap actually boots the system, it performs CPU tests, instruction and addressing tests, and memory and cache tests. If a hardware failure is detected, the diagnostic program halts. The lights contain the ROM address of the halt. If this occurs, call your local DIGITAL Field Service Engineer.

It may, however, be possible to continue with the bootstrap operation if the lights contain the address 17773644, 17773736, or 17773764, which indicates a cache failure. To continue in this case, press CONT.

The M9301-YC bootstrap is capable of relocating its input to various banks of memory. However, RSX-11M can not be bootstrapped in this manner.

2.3.7 M9301-YF Bootstrap ROM

The following instructions bootstrap the system by means of the M9301-YF console emulator. Refer to the M9301 Bootstrap/Terminator Maintenance Manual, Order Number EK-M9301-MM, for other ways to boot the system with the M9301-YF.

Follow this procedure at the operator's terminal:

1. Press the console BOOT switch.

If diagnostics are enabled,* the M9301-YF performs primary CPU diagnostics. The terminal then displays the contents of R0, R4, SP, and R5, respectively; the contents appear as four 16-bit octal numbers. Note that pressing the BOOT switch at this time causes PDP-11 systems without console registers (PDP-11/04s, for example) to copy the PC into R5 before the power-up sequence begins.

The terminal then displays the prompt \$ at the beginning of a new line.

* The M9301-YF micro switches must be set to 000 to perform diagnostics when using the console emulator to boot the system. If the switches are set to 002, the M9301-YF console emulator boots the system without performing diagnostics. Consult a DIGITAL Field Service engineer or see the M9301 Bootstrap/Terminator Maintenance Manual.

GETTING STARTED

- In response to the prompt \$, type the appropriate device code at the terminal, followed by carriage return:

Code	Device
DBn	RP04, RP05, RP06
DKn	RK05
DMn	RK06
DTn	TU56
DXn	RX01
MMn	TU16, TU45, or TE16
MTn	TU10 or TE10
PR	PC11
TT	DL11

In the list of codes above, n represents the device unit number; the only permissible values are 0 through 7. The unit number can be omitted if it is 0.

If diagnostics are enabled, the M9301-YF performs secondary CPU and memory diagnostics before booting the system. The system then displays on the console terminal the start-up sequence described in section 2.4.

2.4 CONSOLE DISPLAY

If the system being bootstrapped contains support for devices which are not in the host configuration, a series of messages appears on the console terminal in the following form:

```
DEVICE ddnn: NOT IN CONFIGURATION
```

where:

```
dd = device name  
nn = unit number
```

Messages of this form indicate which devices are not physically present on the host system. These units are declared OFFLINE by the bootstrap code.

GETTING STARTED

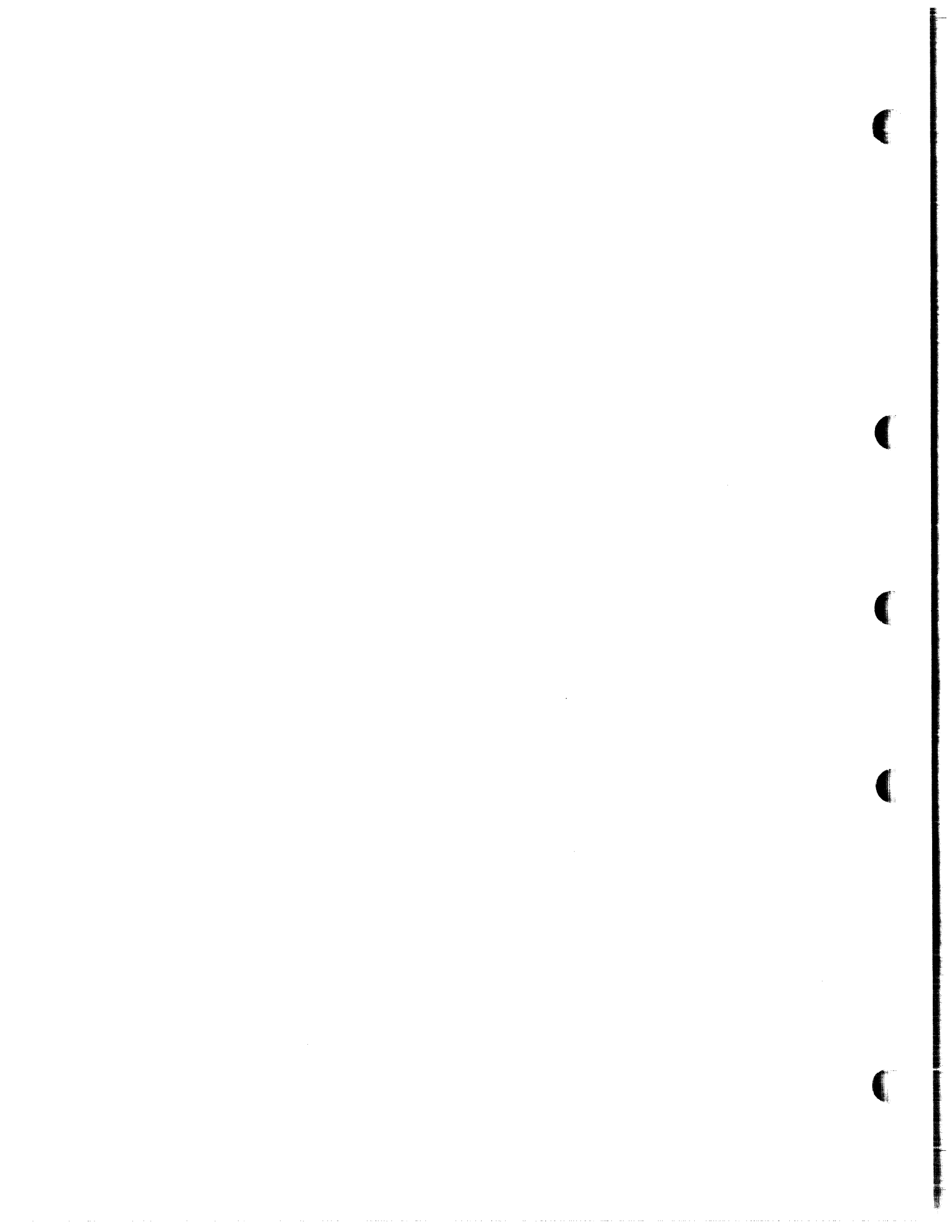
Then the system displays:

```
RSX-11M V03.1 BL22 nnnnK [MAPPED]
>RED ddnn:=SY0:
>RED ddnn:=LB0:
>MOU ddnn:label
>@[1,2]STARTUP
```

where:

V03.1	- The RSX-11M version number.
BL22	- The RSX-11M base level number.
nnnnK	- Size of memory on hardware configuration from which the system was bootstrapped.
MAPPED	- MAPPED is displayed for systems built to use the memory management unit.
dd	- Load device name.
nn	- Load device unit.
label	- The volume label of the system disk.
@[1,2]STARTUP	- Start-up MCR command file that contains user determined commands to initialize the system.

The system is now ready to run. The RED and MOU commands displayed are internally generated REDIRECT and MOUNT commands. The REDIRECT command establishes the load device as the system devices (LB: and SY:), and the MOUNT command mounts the load device as a Files-11 volume. The @[1,2]STARTUP command is also internally generated and executes a set of MCR commands that initialize your system (e.g., to request that you set the time and date, etc.).



CHAPTER 3

SYSGEN DIALOGUE DETAILS

3.1 SYSGEN DIALOGUE

This chapter provides details of the SYSGEN dialogue. Each phase of the process is discussed. Section 3.2 covers phase 1 (SYSGEN.CMD and SYSGEN0.CMD); Section 3.3, the query section (SGNEXEC, SGNPER, SGNTT); Section 3.4 covers phase 2 (SYSGEN2.CMD and BLDDRV.CMD); and Section 3.5, phase 3 (SYSGEN3.CMD and BLDUMD.CMD).

All text, questions, and commands displayed during the running of the command file are described. However, during any single run of the command file, many of these questions and commands will not be executed, since they depend on both the machine configuration that the system generation is being run on, and the target machine the system is being built for. Appendix D contains a console output listing for an actual system generation run.

At various places during the execution of the command files, SYSGEN asks questions to which the user must reply by typing Y (for yes), or N (for no), followed by a carriage return. (A reply of just a carriage return is an alternative way of saying no.) Such questions are distinguished by a leading asterisk (*) and trailing "? [Y/N]:". Other questions require a string response. These have a leading asterisk and trailing "[S]:". There are also questions that require a numeric response. These have a leading asterisk and trailing "[O]:" for an octal response or "[D]:" for a decimal response. Usually, the numeric queries contain range and default arguments such as "[D R:1.-16. D:4.):." (Range arguments are the limits that the response must be within and the default argument is the value assigned if just carriage return is typed.) Command file processing is suspended until an answer is keyed in.

In many places in the description of the command files, a command shown has a UIC specification containing one of the characters x and y. The command actually issued when the command file is processed will contain the character 0 or 4 as a replacement for x or y. The replacement for x depends on the target system (the system being generated) -- if the target system is unmapped, x is replaced by 0; if the target system is mapped, x is replaced by 4. Similarly, the replacement for y depends on the host system (the system that is currently running) -- if the host system is unmapped, y is replaced by 0; if the host system is mapped, y is replaced by 4.

Example:

```
SET /UIC=[1,2x]
```

will, during the processing of the command file, appear as

```
SET /UIC=[1,24]
```

if a mapped system is being generated.

SYSGEN DIALOGUE DETAILS

The SYSGEN command files have been designed to inhibit the installation and removal of tasks already installed in the host system. This makes it possible to perform a SYSGEN on a multi-user system without affecting the tasks in that system. A SYSGEN can be performed on-line with a multi-user system by using the Assign (ASN) command to assign a logical device name (SY:) to a physical device containing a release disk.

3.2 SYSGEN.CMD FILE DETAILS

This section describes the entire SYSGEN.CMD indirect command file by adding descriptive text to the actual command file to clarify the SYSGEN process. The command file is presented in upper-case text; the descriptive text is presented in upper- and lower-case text.

The SYSGEN.CMD indirect command file is common to all distribution kits. Hence, some sections pertain only to a specific kit or group of kits. Each section of the file that differs between kits is identified. To avoid confusion, read only these sections that pertain to your kit.

If you are using the dual RK05 distribution kit, you must initialize the system and supply parameters specific to the dual RK05 kit. Also, it is required that you copy the distribution kit before beginning SYSGEN. The indirect command file PRESYSGEN.CMD supplies the necessary parameters and insures that you have copied the distribution kit.

To 3-7

DUAL RK05

The command file PRESYSGEN.CMD is used only when you are performing a SYSGEN with the dual RK05 distribution kit.

```
; PRESYSGEN <VERSION 03.1>
; COPYRIGHT (C) 1977
; DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;
;
; INITIALIZE SYSTEM FOR DUAL RK05 SYSGEN
;
; THIS COMMAND FILE WILL PREPARE THE SYSTEM DISK FOR USE
; BY THE SYSTEM GENERATION PROGRAMS.
;
; THE DUAL RK05 DISTRIBUTION KIT REQUIRES AT LEAST:
;
; 24K WORDS OF MEMORY, AND
;
; ONE RK05 REMOVABLE PLATTER DISK DRIVE, PLUS
; ONE RK05F FIXED PLATTER DISK DRIVE
; OR
; TWO RK05 REMOVABLE PLATTER DISK DRIVES.
```

* DOES THIS SYSTEM MEET THE ABOVE REQUIREMENTS? [Y/N]:

If it does not, you are informed to contact your local Digital office to obtain the correct distribution kit.

If it does, PRESYSGEN continues.

```
; BEFORE STARTING SYSGEN, YOU MUST MAKE A COPY OF THE DISTRIBUTION
; KIT. THIS WILL ENSURE THAT YOUR DISTRIBUTION KIT IS COMPLETE AND
```

SYSGEN DIALOGUE DETAILS

; SERVE AS A BACKUP. AS THE BASLINE, EXECSRC, AND SYSTEM DISKS ARE
; ALTERED BY SYSGEN, IT IS NECESSARY TO USE A NEW COPY EACH TIME.

* HAVE YOU COPIED THE DISTRIBUTION KIT AS REQUIRED? [Y/N]:

If you have not made a copy, the following is displayed and
PRESYSGEN halts.

; WE WILL EXIT NOW SO THAT YOU CAN COPY THE DISTRIBUTION KIT.
; AFTER THE COPYING IS COMPLETE, START THE PRESYSGEN FILE AGAIN.

If you have copied the kit, PRESYSGEN continues.

* IN WHICH RK05 UNIT IS THE BASLINE DISK MOUNTED? [0 R:0-3]:

The following assumes that the BASLINE disk is mounted in
DK1:.

The RK05 unit containing the BASLINE disk is assigned to the
pseudo device SY:.

ASN DK1:=SY:

* ARE YOU RUNNING SYSGEN STANDALONE? [Y/N]:

STANDALONE SYSGEN

ASN DK1:=LB:

* DOES THIS SYSTEM HAVE TWO RK05 REMOVABLE PLATTER DRIVES? [Y/N]:

If you have two removable RK05 drives, the next question is
bypassed.

If you have a fixed platter drive, you must copy the BASLINE
disk to it.

* HAVE YOU COPIED THE BASLINE DISK TO THE RK05F? [Y/N]:

If you have not, instructions for doing so are displayed and
PRESYSGEN terminates. Otherwise, PRESYSGEN continues with
the query to determine whether or not you are generating a
mapped system.

; WE WILL USE ONE UNIT OF THE RK05F FOR THE SYSTEM DISK. YOU WILL
; HAVE TO COPY THE SYSTEM DISK TO THE RK05F, USING DSCSYS. BECAUSE
; DSCSYS SUPPORTS ONLY TWO LOGICAL DEVICE UNITS, USE THE /UNIT
; SWITCH AS SHOWN BELOW:

; RSX-11S V02.1 BL22 DISK SAVE AND COMPRESS UTILITY

; DSC>DK0:/UNIT=n
; DSC>DK1:/UNIT=m
; DSC>DK0:=DK1:
; DSC>

; AFTER DSC HAS COMPLETED THE COPY, HARDWARE BOOT THE RK05F AND
; START THE PRESYSGEN COMMAND FILE ON IT

INS \$BOO
BOO [1,50]DSCSYS

If you have two removable RK05 drives or if you have copied
the BASLINE disk to the RK05F, PRESYSGEN continues here.

SYSGEN DIALOGUE DETAILS

* ARE YOU GENERATING A MAPPED SYSTEM? [Y/N]:

STANDALONE AND MAPPED

```
SET /UIC=[1,54]
INS $PIP
PIP [1,54]/RE/NV=[1,50]BADSYS.*;*,DSCSYS.*;*,PRESRV.*;*
REM PIP
```

```
; WE WILL NOW BOOT THE MAPPED BASELINE SYSTEM. ONCE IT IS RUNNING,
; DISMOUNT THE SYSTEM DISK AND SAVE THE SYSTEM, WRITING A NEW BOOT
; BLOCK. WHEN THE SYSTEM COMES UP AGAIN, START THE PRESGN1 INDIRECT
; COMMAND FILE. E.G.,
;
;      RSX11M V03.1 BL22 64K MAPPED
;      >RED DK1:=SY0:
;      >RED DK1:=LB0:
;      >MOU DK1:BASELINE
;      >@[1,2]STARTUP
;      >*PLEASE ENTER TIME AND DATE (HR:MN DD-MMM-YY) [S]: 1:00 1/1/78
;      >TIM 1:00 1/1/78
;      >@ <EOF>
;      >DMO DK1:
;      >SAV /WB
;
;      RSX11M V03.1 BL22 64K MAPPED
;      >RED DK1:=SY0:
;      >RED DK1:=LB0:
;      >MOU DK1:BASELINE
;      >@[1,2]STARTUP
;      >*PLEASE ENTER TIME AND DATE (HR:MN DD-MMM-YY) [S]: 1:02 1/1/78
;      >TIM 1:02 1/1/78
;      >@ <EOF>
;      >@ PRESGN1
```

```
INS $BOO
BOO [1,54]RSX11M
```

The following is the display of PRESGN1.

* HAVE YOU SAVED THE MAPPED SYSTEM? [Y/N]:

If you have not, the following is displayed and PRESGN1 halts. Otherwise, PRESGN1 continues.

```
; WE WILL EXIT NOW SO THAT YOU CAN DISMOUNT THE BASELINE DISK,
; SAVE AND WRITE A BOOT BLOCK FOR THE MAPPED SYSTEM AND THEN
; RESTART THE PRESGN1 COMMAND FILE.
;
;      >DMO DK1:
;      >SAV /WB
```

If you have saved the mapped system, PRESGN1 continues here.

```
INS $PIP
SET /UIC=[1,54]
PIP [1,50]*.*;*/DE
```

The above commands delete the unmapped system.

* ENTER THE UNIT NUMBER OF THE EMPTY RK05 DRIVE [0 R:0-3]:

The following assumes DK2: is the empty drive.

SYSGEN DIALOGUE DETAILS

; PLACE THE EXECSRC DISK IN DK2: AND START IT UP

* IS THE EXECSRC DISK READY? [Y/N]:

This query is repeated until the disk is ready (Y response).

```
MOU DK2:EXECSRC
ASN DK2:=SY:
ASN DK1:=LB:
SET /UIC=[1,1]
PIP LB:/CO=RSXMAC.SML
REM PIP
```

Control is then passed to the indirect command file
SYSGEN.CMD.

STANDALONE AND UNMAPPED

```
SET /UIC=[1,54]
INS $PIP
PIP *.*;*/DE
```

The above commands delete the mapped system.

* ENTER THE UNIT NUMBER OF THE EMPTY RK05 DRIVE [0 R:0-3]:

The following assumes DK2: is the empty drive.

; PLACE THE EXECSRC DISK IN DK2: AND START IT UP (WRITE ENABLED)

* IS THE EXECSRC DISK READY? [Y/N]:

This query is repeated until the disk is ready (Y response).

```
MOU DK2:EXECSRC
ASN DK2:=SY:
SET /UIC=[1,1]
PIP LB:/CO=RSXMAC.SML
REM PIP
```

Control is then passed to the indirect command file
SYSGEN.CMD.

****ON-LINE SYSGEN****

```
; TO PERFORM A SYSGEN ON-LINE, THE FOLLOWING TASKS MUST BE
; INSTALLED: EDI, FLX, INI, MAC, PIP, TKB, AND UFD. THESE TASKS MUST
; REMAIN INSTALLED ON THE RUNNING SYSTEM UNTIL THE SYSGEN PROCESS IS
; COMPLETE. WE WILL PAUSE NOW TO ALLOW YOU TO INSTALL THE REQUIRED
; TASKS.
```

After you have installed the requisite tasks, type RES AT.
to continue. The RK05 unit that contains the BASLINE disk
is then assigned to the pseudo device LB:. The following
assumes that DK1: contains the BASLINE disk.

```
ASN DK1:=LB:
```

* DOES THE RUNNING SYSTEM HAVE TWO REMOVABLE RK05 DISK DRIVES? [Y/N]:

If you have two removable RK05s, the following is displayed.
If you have an RK05F, the next three queries and associated
text is omitted; the next query will concern the unit
number of the RK05F.

SYSGEN DIALOGUE DETAILS

* ARE YOU GENERATING A MAPPED SYSTEM? [Y/N]:

If you are, the unmapped BAD, DSC, and PRESRV files are copied to the mapped directory and then the unmapped files are deleted.

```
SET /UIC=[1,54]
PIP [1,54]/RE/NV=[1,50]BADSYS.*;*,DSCSYS.*;*,PRESRV.*;*
PIP [1,50]*.*;*/DE
```

If you are not generating a mapped system, the files for a mapped system are deleted.

```
SET /UIC=[1,50]
PIP [1,54]*.*;*/DE
```

Whether you are generating a mapped or unmapped system, the following is displayed.

* ENTER THE UNIT NUMBER OF THE EMPTY RK05 DRIVE [0 R:0-3]:

The following assumes that DK2: is the empty drive.

; PLACE THE EXECSRC DISK IN DK2: AND START IT UP (WRITE ENABLED).

* IS THE EXECSRC DISK READY? [Y/N]:

This question is repeated until the disk is ready (Y response).

```
MOU DK2:EXECSRC
ASN DK2:=SY:
SET /UIC=[1,1]
PIP LB:/CO=RSXMAC.SML
```

Control then passes to the indirect command file SYSGEN.CMD.

The following is displayed if you have an RK05F drive.

```
; WE WILL USE ONE UNIT OF THE RK05F FOR THE BASLINE DISK. BECAUSE
; THE BASLINE DISK WILL NOT BE USED AS THE RUNNING SYSTEM, WE WILL
; CREATE THE UFD'S NECESSARY AND PIP THE FILES TO THE RK05F.
```

* ENTER ONE UNIT NUMBER OF THE RK05F:

The following assumes that DK1: was entered.

```
ALL DK1:
INI DK1:BASELINE/BAD=[AUTO]
MOU DK1:BASELINE
ASN DK1:=SY:
SET /UIC=[1,1]
PIP /UF/CO=LB:SYSLIB.OLB,VMLIB
SET /UIC=[1,2]
PIP /UF/CO=LB:QIOSYM.MSG,STARTUP.CMD
UFD DK1:[1,20]
UFD DK1:[1,24]
UFD DK1:[1,50]
UFD DK1:[1,54]
UFD DK1:[2,20]
UFD DK1:[200,200]
SET /UIC=[200,200]
PIP =LB:PRESGN2.CMD,SGNXFER,SGNXFER2,COPYTSK
```


SYSGEN DIALOGUE DETAILS

* ARE YOU GENERATING A MAPPED SYSTEM? [Y/N]:

The following assumes that you are generating a mapped system. Note that if you are generating an unmapped system the UIC is set to [1,50].

```
SET /UIC=[1,54]
PIP =LB:[1,50]BADSYS.*,DSCSYS.*,PRESRV.*
PIP @[200,200]COPYTSK
```

After the files are copied, the indirect command file PRESGN2.CMD is invoked to replace the BASLINE disk with the EXEC SRC disk. The following actually comes from PRESGN2.CMD.

```
DMO LB:
ASN LB:=SY:
```

```
; REMOVE THE BASLINE DISK FROM DK1: AND REPLACE IT WITH THE
; EXEC SRC DISK.
```

* IS THE EXEC SRC DISK READY? [Y/N]:

This question is repeated until the disk is ready (Y response).

```
MOU DK1:EXEC SRC
ASN DK1:=LB:
SET /UIC=[1,1]
PIP LB:/CO=RSXMAC.SML
```

Control is then passed to the indirect command file SYSGEN.CMD.

ALL SYSTEMS *Start?*

The following begins the display of the indirect command file SYSGEN.CMD.

```
;
; SYSGEN PART 1 <VERSION 03.1>
;
; COPYRIGHT (C) 1975, 1976, 1977
; DIGITAL EQUIPMENT CORP., MAYNARD MASS. 01754.
;
; DETERMINE SYSTEM FEATURES AND ASSEMBLE THE EXECUTIVE
;
;
```

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

```
;
; EXPANDED COMMENTS PROVIDE A DESCRIPTION OF EVERY STEP IN THIS
; SYSGEN COMMAND FILE. ON THE OTHER HAND, SHORT COMMENTS
; PROVIDE VIRTUALLY NO EXPLANATORY TEXT.
```

```
;
* DO YOU WANT EXPANDED COMMENTS? [Y/N]: Y
```

For the experienced programmer who has performed many SYSGENs, much of the descriptive text in the file may be suppressed by answering N to this question. It is recommended that the less experienced or first time user answer Y, in order to be guided through the system generation process.

SYSGEN DIALOGUE DETAILS

The next set of queries are asked to identify the distribution kit that is being used in SYSGEN. When a kit has been identified (a Y response to the query), further queries as to which distribution kit is being used are omitted and SYSGEN continues processing the applicable sections.

* DO YOU HAVE THE SINGLE RK05 DISTRIBUTION KIT? [Y/N]:N

If the response is affirmative, further queries to identify the kit are not necessary. The next queries are found under the heading SINGLE RK05 kit.

If the response is negative, the following question is asked.

* DO YOU HAVE THE DUAL RK05 DISTRIBUTION KIT? [Y/N]:N

If the response is affirmative, continue under the heading DUAL RK05 KIT.

If the response is negative, the following question is asked.

* DO YOU HAVE THE RL01 DISTRIBUTION KIT? [Y/N]:N to 3-12

This is the last query to identify the distribution kit. A Y response obviously means that the kit is an RL01 kit. The next queries are found under the heading RL01 KIT.

An N response implies that the distribution kit is a big disk type (RP02/03/04/05/06, RM03, or RK06). The next queries are found under the heading ALL KITS.

*****SINGLE RK05 KIT*****

This sections appears only if the response as to whether or not the single RK05 kit is being used was affirmative.

;
; AS A RESULT OF THE SYSGEN PROCEDURE, THE DISTRIBUTION KIT WILL
; BE CUSTOMIZED TO YOUR TARGET SYSTEM CONFIGURATION. YOU MUST MAKE
; A COPY OF IT BEFORE PROCEEDING ANY FURTHER IF YOU HAVEN'T
; ALREADY DONE SO.

* HAVE YOU ALREADY MADE A COPY OF THE EXEC SOURCE DISK? [Y/N]:

As a result of SYSGEN, a number of files will be modified on the distribution kit. This might make the kit unusable for later SYSGENs. Therefore, the user must make a backup copy before performing a SYSGEN. If the answer to this question is N, SYSGEN part 1 terminates.

;
; DUE TO DISK SPACE RESTRICTIONS ON THE RK05 DISTRIBUTION KIT
; (BOTH RK DISK AND MAGTAPE KITS) DRIVERS WHICH WILL NOT
; BE USED IN YOUR TARGET SYSTEM MUST BE DELETED.

* HAVE YOU ALREADY DELETED THE DRIVER SOURCE MODULES? [Y/N]:

If the answer to this question is Y, the next section is bypassed. If the answer is N, the next section is entered to delete unused files. This text actually comes from the command file SYSGEN0.CMD.

SYSGEN DIALOGUE DETAILS

```

;
; WE WILL NOW DELETE THE UNUSED DRIVER MODULES. THIS WILL MAKE
; ROOM FOR COMPLETING THE SYSGEN AND ALSO ROOM FOR CORRECTIONS
; TO THE EXECUTIVE WHICH ARE PUBLISHED IN THE SOFTWARE
; DISPATCH. IN GENERAL THIS WILL NOT CAUSE PROBLEMS
; SINCE RSX11M SUPPORTS A NUMBER OF PERIPHERAL DEVICES
; WHICH HAVE BEEN SUPERSEDED BY THOSE OF NEWER DESIGN.
; FOR EXAMPLE:
;     IF YOU HAVE AN RP04/05/06 YOU PROBABLY DON'T HAVE AN RPR02/03
;     IF YOU HAVE AN RS03/RS04 YOU PROBABLY DON'T HAVE AN RF11
;     IF YOU HAVE A TU16/45 YOU PROBABLY DON'T HAVE A TU10
;     IF YOU HAVE A DMC11 YOU PROBABLY DON'T HAVE A DALL-B
; AND SO ON.
;
; IF AT A LATER DATE, YOU ACQUIRE A DEVICE WHOSE DRIVER HAS BEEN
; DELETED FROM THIS DISK, YOU CAN EASILY RETRIEVE IT FROM THE
; ORIGINAL DISTRIBUTION DISK AND PUT IT ON THIS DISK.
;
SET /UIC=[11,10]

```

In the following section, there is a question preceding each PIP command. The PIP command will actually be issued only if the answer to the preceding question is N.

```

* DO YOU HAVE ANY AD01-D A/D CONVERTER CONTROLLERS? [Y/N]:
PIP ADDR.V.MAC;*/DE
* ANY AFC11 A/D CONVERTER CONTROLLERS? [Y/N]:
PIP AFDRV.MAC;*/DE
* ANY AR11 LABORATORY PERIPHERAL SYSTEM CONTROLLERS? [Y/N]:
PIP ARDRV.MAC;*/DE
* ANY CR11/CM11 CARD READER CONTROLLERS? [Y/N]:
PIP CRDRV.MAC;*/DE
* ANY TALL/TU60 CASSETTE DRIVES? [Y/N]:
PIP CTDRV.MAC;*/DE
* ANY RJP/RWP04/05/06 DISK DRIVES? [Y/N]:
PIP DBDRV.MAC;*/DE
* ANY RF11 FIXED HEAD DISK DRIVES? [Y/N]:
PIP DFDRV.MAC;*/DE
* ANY RK11/RK03/05 DISK DRIVES? [Y/N]:
PIP DKDRV.MAC;*/DE
* ANY RL11/RL01 DISK DRIVES? [Y/N]:
PIP DLDRV.MAC;*/DE
* ANY RK611/RK06 DISK DRIVES? [Y/N]:
PIP DMDRV.MAC;*/DE
* ANY RP11/RPR02/RP03 DISK DRIVES? [Y/N]:
PIP DPDRV.MAC;*/DE
* ANY RWM03 DISK DRIVES? [Y/N]:
PIP DRDRV.MAC;*/DE
* ANY RJS/RWS03/04 FIXED HEAD DISK DRIVES? [Y/N]:
PIP DSDRV.MAC;*/DE
* ANY TC11/TU56 DECTAPE DRIVES? [Y/N]:
PIP DTDRV.MAC;*/DE
* ANY RX11/RX01 FLOPPY DISK DRIVES? [Y/N]:
PIP DXDRV.MAC;*/DE
* ANY VT11/VS60 GRAPHICS DISPLAYS? [Y/N]:
PIP GRDRV.MAC;*/DE
* ANY LP11 LABORATORY PERIPHERAL ACCELERATORS? [Y/N]:
PIP LADRV.MAC;*/DE
* ANY LP11/LS11/LV11 PRINTERS? [Y/N]:
PIP LPDRV.MAC;*/DE
* ANY LPS11 LABORATORY PERIPHERAL SYSTEMS? [Y/N]:
PIP LSDRV.MAC;*/DE
* ANY TJ/TWU16/45/TE16 TAPE DRIVES? [Y/N]:
PIP MMDRV.MAC;*/DE

```

SYSGEN DIALOGUE DETAILS

* ANY TM11/TU10/TE10/TS03 TAPE DRIVES? [Y/N]:
PIP MTDV.MAC;*/DE
* ANY PC11 PAPER TAPE READER/PUNCHES? [Y/N]:
PIP PPDRV.MAC;*/DE
* ANY PR11 PAPER TAPE READERS? [Y/N]:
PIP PRDRV.MAC;*/DE
* ANY ICR/ICS11 INDUSTRIAL CONTROLLERS? [Y/N]:
PIP ICDV.MAC;*/DE,ICOM.MAC;*
* ANY DRS/DSS11 DIGITAL INPUT/OUTPUT MODULES? [Y/N]:
PIP ISDRV.MAC;*/DE,ISCOM.MAC;*,DSSDI.MAC;*
* ANY UDC11 UNIVERSAL INDUSTRIAL CONTROLLERS? [Y/N]:
PIP UDDRV.MAC;*/DE,UDCOM.MAC;*
* ANY DALL-B UNIBUS LINKS? [Y/N]:
PIP XBDRV.MAC;*/DE
* ANY DL11-E ASYNCHRONOUS LINES? [Y/N]:
PIP XLDRV.MAC;*/DE
* ANY DMC11 INTERPROCESSOR LINKS? [Y/N]:
PIP XMDRV.MAC;*/DE
* ANY DP11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XPDRV.MAC;*/DE
* ANY DQ11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XQDRV.MAC;*/DE
* ANY DU11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XUDRV.MAC;*/DE
* ANY DUP11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XWDRV.MAC;*/DE

This is the end of SYSGEN0.CMD.

SET /UIC=[200,200]
PIP SYSGEN0.CMD;*/DE

The next queries that will be displayed appear under the heading ALL KITS.

*****DUAL RK05 KIT*****

This section appears only if the response as to whether or not the dual RK05 kit is being used was affirmative and if SYSGEN is being initiated manually. The user is asked to identify the RK05 units that contain the BASLINE disk and the EXEC SRC disk.

*IN WHICH RK05 UNIT IS THE BASLINE DISK MOUNTED?
*IN WHICH RK05 UNIT IS THE EXEC SRC DISK MOUNTED?

The unit that contains the BASLINE disk is then assigned to LB:, and the unit that contains EXEC SRC is assigned to SY:.

ASN DKn:=SY:
ASN DKn:=LB:

; DUE TO DISK SPACE RESTRICTIONS ON THE RK05 DISTRIBUTION KIT
; (BOTH RK DISK AND MAGTAPE KITS) DRIVERS WHICH WILL NOT
; BE USED IN YOUR TARGET SYSTEM MUST BE DELETED.
;
* HAVE YOU ALREADY DELETED THE DRIVER SOURCE MODULES? [Y/N]:

If the answer to this question is Y, the next section bypassed. If the answer is N, the next section is entered to delete unused files. This text actually comes from the command file SYSGEN0.CMD.

;
; WE WILL NOW DELETE THE UNUSED DRIVER MODULES. THIS WILL MAKE
; ROOM FOR COMPLETING THE SYSGEN AND ALSO ROOM FOR CORRECTIONS

SYSGEN DIALOGUE DETAILS

```
; TO THE EXECUTIVE WHICH ARE PUBLISHED IN THE SOFTWARE
; DISPATCH. IN GENERAL THIS WILL NOT CAUSE PROBLEMS
; SINCE RSX11M SUPPORTS A NUMBER OF PERIPHERAL DEVICES
; WHICH HAVE BEEN SUPERSEDED BY THOSE OF NEWER DESIGN.
; FOR EXAMPLE:
;   IF YOU HAVE AN RP04/05/06 YOU PROBABLY DON'T HAVE AN RPR02/03
;   IF YOU HAVE AN RS03/RS04 YOU PROBABLY DON'T HAVE AN RF11
;   IF YOU HAVE A TU16/45 YOU PROBABLY DON'T HAVE A TU10
;   IF YOU HAVE A DMC11 YOU PROBABLY DON'T HAVE A DALL-B
; AND SO ON.
;
; IF AT A LATER DATE, YOU ACQUIRE A DEVICE WHOSE DRIVER HAS BEEN
; DELETED FROM THIS DISK, YOU CAN EASILY RETRIEVE IT FROM THE
; ORIGINAL DISTRIBUTION DISK AND PUT IT ON THIS DISK.
;
SET /UIC=[11,10]
```

In the following section, there is a question preceding each PIP command. The PIP command will actually be issued only if the answer to the preceding question is N.

```
* DO YOU HAVE ANY AD01-D A/D CONVERTER CONTROLLERS? [Y/N]:
PIP ADDR.V.MAC;*/DE
* ANY AFC11 A/D CONVERTER CONTROLLERS? [Y/N]:
PIP AFDRV.MAC;*/DE
* ANY AR11 LABORATORY PERIPHERAL SYSTEM CONTROLLERS? [Y/N]:
PIP ARDRV.MAC;*/DE
* ANY CR11/CM11 CARD READER CONTROLLERS? [Y/N]:
PIP CRDRV.MAC;*/DE
* ANY TALL/TU60 CASSETTE DRIVES? [Y/N]:
PIP CTDRV.MAC;*/DE
* ANY RJP/RWP04/05/06 DISK DRIVES? [Y/N]:
PIP DBDRV.MAC;*/DE
* ANY RF11 FIXED HEAD DISK DRIVES? [Y/N]:
PIP DFDRV.MAC;*/DE
* ANY RK11/RK03/05 DISK DRIVES? [Y/N]:
PIP DKDRV.MAC;*/DE
* ANY RL11/RL01 DISK DRIVES? [Y/N]:
PIP DLDRV.MAC;*/DE
* ANY RK611/RK06 DISK DRIVES? [Y/N]:
PIP DMDRV.MAC;*/DE
* ANY RP11/RPR02/RP03 DISK DRIVES? [Y/N]:
PIP DPDRV.MAC;*/DE
* ANY RWM03 DISK DRIVES? [Y/N]:
PIP DRDRV.MAC;*/DE
* ANY RJS/RWS03/04 FIXED HEAD DISK DRIVES? [Y/N]:
PIP DSDRV.MAC;*/DE
* ANY TC11/TU56 DECTAPE DRIVES? [Y/N]:
PIP DTDRV.MAC;*/DE
* ANY RX11/RX01 FLOPPY DISK DRIVES? [Y/N]:
PIP DXDRV.MAC;*/DE
* ANY VT11/VS60 GRAPHICS DISPLAYS? [Y/N]:
PIP GRDRV.MAC;*/DE
* ANY LP11 LABORATORY PERIPHERAL ACCELERATORS? [Y/N]:
PIP LADRV.MAC;*/DE
* ANY LP11/LS11/LV11 PRINTERS? [Y/N]:
PIP LPDRV.MAC;*/DE
* ANY LPS11 LABORATORY PERIPHERAL SYSTEMS? [Y/N]:
PIP LSDRV.MAC;*/DE
* ANY TJ/TWU16/45/TE16 TAPE DRIVES? [Y/N]:
PIP MMDRV.MAC;*/DE
* ANY TM11/TU10/TE10/TS03 TAPE DRIVES? [Y/N]:
PIP MTDRV.MAC;*/DE
* ANY PC11 PAPER TAPE READER/PUNCHES? [Y/N]:
```

SYSGEN DIALOGUE DETAILS

PIP PPDRV.MAC;*/DE
* ANY PR11 PAPER TAPE READERS? [Y/N]:
PIP PRDRV.MAC;*/DE
* ANY ICR/ICS11 INDUSTRIAL CONTROLLERS? [Y/N]:
PIP ICDRV.MAC;*/DE,ICOM.MAC;*
* ANY DRS/DSS11 DIGITAL INPUT/OUTPUT MODULES? [Y/N]:
PIP ISDRV.MAC;*/DE,ISCOM.MAC;*,DSSDI.MAC;*
* ANY UDC11 UNIVERSAL INDUSTRIAL CONTROLLERS? [Y/N]
PIP UDDRV.MAC;*/DE,UDCOM.MAC;*
* ANY DALL-B UNIBUS LINKS? [Y/N]:
PIP XBDRV.MAC;*/DE
* ANY DL11-E ASYNCHRONOUS LINES? [Y/N]:
PIP XLDRV.MAC;*/DE
* ANY DMC11 INTERPROCESSOR LINKS? [Y/N]:
PIP XMDRV.MAC;*/DE
* ANY DP11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XPDRV.MAC;*/DE
* ANY DQ11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XQDRV.MAC;*/DE
* ANY DU11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XUDRV.MAC;*/DE
* ANY DUP11 SYNCHRONOUS LINE INTERFACES? [Y/N]:
PIP XWDRV.MAC;*/DE

This is the end of SYSGEN0.CMD.

SET /UIC=[200,200]
PIP SYSGEN0.CMD;*/DE

The next queries that will be displayed appear under the heading ALL KITS.

****RL01 KIT****

This section appears only if the response as to whether or not the RL01 kit is being used was affirmative. If you are using the RL01 kit, you must make a copy of it before proceeding with SYSGEN.

; YOU MUST MAKE A COPY OF THE RL01 DISTRIBUTION KIT, IF YOU
; HAVE NOT DONE SO ALREADY.

* HAVE YOU COPIED THE RL01 DISTRIBUTION KIT? [Y/N]:

If you have not copied the kit, the following is displayed and the command file exits. You must then restart SYSGEN.

; WE WILL EXIT NOW SO THAT YOU CAN COPY THE DISTRIBUTION KIT.
; AFTER YOU HAVE COPIED THE KIT RESTART THE SYSGEN COMMAND FILE.

If you have copied the kit, the next queries appear under the heading ALL KITS.

*****all kits*****

* ARE YOU BUILDING AN RSX11S SYSTEM? [Y/N]: N

The selection of features and assembly of the Executive are controlled by the SYSGEN.CMD command file. This question is used later to select the correct SYSGEN phase 2 command file for RSX-11M or RSX-11S and to determine the Executive options.

SYSGEN DIALOGUE DETAILS

* ARE YOU BUILDING A MAPPED SYSTEM? [Y/N]: Y

The reply to this question determines the UIC settings that will be generated during the SYSGEN process. See Appendix A for UIC conventions used on the distribution kit disks.

* ARE YOU RUNNING ON A MACHINE WITH AT LEAST 24K WORDS? [Y/N]: Y

The Baseline System Executive is set up with a 14K partition that can be used if the host machine has at least 24K of memory. If this is the case, SYSGEN will use the larger and faster version of MACRO-11 and the task builder during the generation process.

* ARE YOU RUNNING ON A MACHINE WITH A LINE PRINTER? [Y/N]: Y

If you are, the next question is asked. Otherwise it is omitted.

* IS IT A 132. COLUMN LINE PRINTER? [Y/N]: Y

* WILL YOUR SYSTEM INCLUDE DSS-11 SUPPORT? [Y/N]: N
* WILL YOUR SYSTEM INCLUDE ICS/ICR-11 SUPPORT? [Y/N]: Y

When building DSS-11 and/or ICS/ICR-11 support into the Executive, device common blocks that map to the DSS-11 and/or ICS/ICR-11 device registers must be copied from the source disk to the disk on which SYSGEN phase 2 will be run. The reply to this question will cause the proper files to be copied at the right time.

* WILL YOUR SYSTEM INCLUDE UDC-11 SUPPORT? [Y/N]: N

When building UDC11 support into the Executive, device common blocks that map to the UDC11 device registers must be copied from the source disk to the disk on which SYSGEN phase 2 will be run. The reply to this question will cause the proper files to be copied at the right time. This question will not be asked if ICS/ICR-11 support was selected, since ICS/ICR-11 support precludes UDC11 support. The following section is pertinent if you are using an RK06, RL01, or RP distribution kit. It is also necessary on the RK05 kits (single or dual) if the driver sources have already been deleted.

; DELETE FILES FROM PAST SYSGENS

; NOTE: ON VIRGIN DISKS, NONE OF THE FILES WE TRY TO
; DELETE WILL EXIST. PIP WILL GIVE ERROR MESSAGES
; THAT SHOULD INDICATE THAT THE FILE DOES NOT EXIST.

In generating a system, several files are created. These files are of no use after a successful completion of a SYSGEN. If another SYSGEN is to be performed from a disk on which a previous SYSGEN was performed, these files should be deleted to free disk space. The following commands accomplish the desired cleanup.

By convention, the following files in an unmapped system are stored under UIC [11,20]:

SYSGEN DIALOGUE DETAILS

1. The assembly command file to assemble the Executive (RSXASM.CMD)
2. The build command file to build the Executive (RSXBLD.CMD)
3. Executive object modules created during the assembly of the Executive
4. A file of concatenated Executive object modules built by PIP and used by the Librarian to build the Executive object module library
5. Files for the DSS-11 and/or ICS/ICR-11 or UDC11 used to build device common blocks for tasks which reference the device

PIP [11,20] *.OBJ;*/DE,*.UDC;*,*.ICR;*,*.IDS;*

The preceding PIP commands delete:

1. All object module files
2. All versions of UDC11 modules
3. All versions of ICS/ICR-11 modules
4. All versions of DSS-11 modules

On a release kit disk that has never had a SYSGEN performed on it, no residual files from a previous SYSGEN exist. Thus, the attempted deletion is flagged by PIP.

These are warning diagnostics and do not affect the SYSGEN currently in progress.

PIP [11,24] *.OBJ;*/DE,*.UDC;*,*.ICR;*,*.IDS;*

It cannot be known whether the previous SYSGEN done on the source disk was for a mapped or an unmapped system. The preceding command deletes the files generated for building a mapped system.

PIP [11,30] UDCOM.LST;*/DE,ICTAB;*,ICOM;*,DSSDI;*,ISCOM;*

PIP [11,34] UDCOM.LST;*/DE,ICTAB;*,ICOM;*,DSSDI;*,ISCOM;*

The previous commands delete listing files generated for DSS-11, ICR/ICS-11, or UDC11 common blocks for both mapped and unmapped areas on the disk.

By convention, UIC [11,10] is used for the device table file (SYSTB.MAC), prefix file (RSXMC.MAC), and the ICR/ICS-11 table file produced during the running of the three query files. The output of the query files is used to configure the system.

PIP [11,10] RSXMC.MAC;*/DE,SYSTB;*,ICTAB;*,RSXBLD.TMP;*

Delete all existing versions of the device table file, prefix file, and ICS/ICR-11 table.

SYSGEN DIALOGUE DETAILS

```
PIP [11,20] RSXASM.CMD;*/DE,RSXBLD;*
PIP [11,24] RSXASM.CMD;*/DE,RSXBLD;*
```

Delete all existing versions of the assembly command file and task-build command file for the executive.

Regardless of the distribution kit you are using and whether or not the driver sources have been deleted, processing continues here.

```
SET /UIC=[11,10]
```

3.3 SYSGEN QUERY SECTION

```
; NOW WE BEGIN THE SYSGEN QUERY SECTION TO SELECT THE EXECUTIVE
; FEATURES AND PERIPHERAL DEVICES WE WANT IN THE NEW SYSTEM
```

Control is then passed to the SYSGEN query section beginning with the indirect command file SGNEEXEC.CMD.

The SYSGEN query section is run to produce the five files mentioned previously. This process consists of a number of interactive questions. The answers you supply to these queries provide SYSGEN with the information necessary to construct its output files. These files are then used by MACRO-11 and the Task Builder to create the user-tailored system.

The question pertaining to production of the Executive map should be answered Y, since it is required in phase 2 of SYSGEN to determine partition layout.

The Baseline System does not contain a print spooler; therefore, spooling of the listings or map should not be specified.

The SYSGEN query section presents queries which, when answered, define Executive options, Processor options, and the Peripheral set for the user-tailored system.

The query section consists of a series of questions which the user answers. At the completion of the query section, the user has specified all of the following:

1. Executive options
2. Processor options
3. Peripheral set

This section contains every question (listed in order of appearance) in the dialogue conducted by the query section. The dialogue itself has two options, long and short. Short dialogue consists only of the queries. Long dialogue precedes each query with explanatory text.

In the text which follows, upper case is produced by the query section dialogue. Any additional explanation required appears in lower case and is indented for easy recognition.

```
; EXPANDED COMMENTS RESULT IN THE DISPLAY OF EXPLANATORY TEXT
; PRECEDING EACH QUERY. SHORT DIALOGUE OMITTS THE TEXT. EXPANDED
; COMMENTS ARE AVAILABLE ON A PER QUERY BASIS BY ENTERING ESCAPE
; OR ALTMODE FOLLOWING THE DISPLAY OF THE QUERY.
```

```
* LONG DIALOGUE DESIRED FOR EXECUTIVE/PROCESSOR OPTIONS? [Y/N]:Y
```

SYSGEN DIALOGUE DETAILS

Once long dialogue is chosen, the explanatory text is displayed prior to each Executive/processor query and cannot be suppressed (except on a per query basis with CTRL/O). Selective short dialogue produces explanatory text following the query only when that query has been answered using ALTMODE/ESCAPE.

; SYSGEN PRODUCES INDIRECT FILES WHICH ARE SUBSEQUENTLY USED TO
; ASSEMBLE THE USER-TAILORED EXECUTIVE. LISTING PRODUCTION IS
; TIME CONSUMING AND IS NOT RECOMMENDED, ESPECIALLY IF THE 8K
; ASSEMBLER IS BEING USED (WHICH IS REQUIRED ON A 16K SYSTEM).

* ASSEMBLY LISTING FILES DESIRED? [Y/N]: **N**

;
; FOR THE SINGLE RK05, DUAL RK05 OR RL01 DISTRIBUTION KITS, RUNNING
; STANDALONE, YOU MAY DIRECT THE EXECUTIVE LISTINGS TO THE LINE
; PRINTER, OR ANOTHER DISK OF THE SAME TYPE AS YOUR KIT. NOTE THAT
; THE LISTINGS WILL NOT FIT ON THE DISTRIBUTION DISKS FOR THE ABOVE.
;
; FOR OTHER DISTRIBUTION KITS, YOU MAY SPECIFY A LINE PRINTER, THE
; THE DISTRIBUTION KIT DISK (SY0) OR A SECOND DISK OF THE SAME TYPE.
;
; FOR ALL ONLINE SYSGENS, YOU MAY SPECIFY ANY DISK WITH A LEAST
; 4000 FREE BLOCKS. NOTE THAT SYSGEN WILL NOT LOAD THE DRIVER FOR
; THIS DISK.

The next two queries do not appear unless assembly listings were requested.

* WHAT IS TO BE THE LISTING DEVICE? [DDU]:

The listing files need not be directed to a line printer. They can be directed to a terminal or a disk, e.g., TT0: or DK1:, subject to the above restrictions.

; SPOOLING WILL ONLY ACTUALLY OCCUR FOR DIRECTORY DEVICES.
; NOTE THAT THE BASELINE SYSTEM DOES NOT INCLUDE A PRINT SPOOLER.

* SPOOL LISTING FILES? [Y/N]:

The Baseline System does not have a print spooler. Therefore, if the SYSGEN is being performed on the Baseline System, the user should select no spooling of either listing files or map files.

; A TASK BUILDER MAP IS STRONGLY RECOMMENDED. ESTABLISHING
; PARTITIONS AND DIAGNOSING SYSTEM FAILURES REQUIRE THIS MAP.
; FOR ALL DISTRIBUTION KITS. IT IS RECOMMENDED
; THAT YOU SPECIFY SY0 FOR THE MAP
; DEVICE.

* TASK BUILDER MAP DESIRED? [Y/N]: **Y**

The only way to lay out partitions for a target system is to have the value of the last address used by the Executive. This value can be obtained only from the Executive memory allocation map. The next two queries do not appear unless a map was requested.

* WHAT IS TO BE THE MAP DEVICE? [DDU]: **L P 0 :**

SYSGEN DIALOGUE DETAILS

* SPOOL MAP FILE? [Y/N]: **N**

; SPOOLING WILL ONLY ACTUALLY OCCUR FOR DIRECTORY DEVICES.
; NOTE THAT THE BASELINE SYSTEM DOES NOT INCLUDE A PRINT SPOOLER.
;
; THE PRECEDING QUERIES DO NOT AFFECT THE USER-TAILORED
; EXECUTIVE. THE EXECUTIVE OPTION QUERIES THAT FOLLOW WHICH ARE
; PRECEDED BY A SINGLE ASTERISK ARE INCLUDED IN THE BASELINE
; SYSTEM. THE FEATURE, HOWEVER, IS NOT ESSENTIAL TO THE
; OPERATION OF A MINIMUM SYSTEM. DOUBLE ASTERISKED QUERIES MUST
; BE SELECTED FOR FULL SUPPORT OF THE MINIMUM SYSTEM. QUERIES
; WITH NO ASTERISKS ARE NOT IN THE MINIMUM SYSTEM AND ARE
; OPTIONAL.

The indication of minimum system features applies only to
RSX-11M systems.

;BEGIN EXECUTIVE SERVICE OPTIONS.

; AS DISTRIBUTED, THE RSX-11M SOURCE DISK PROVIDES FOR THE
; GENERATION OF AN RSX-11S EXECUTIVE. IN ORDER TO GENERATE SUCH
; A SYSTEM YOU MUST HAVE AN RSX-11S LICENSE AND CANNOT INCLUDE
; FILES-11, CHECKPOINTING, NONRESIDENT TASK, OR DYNAMIC MEMORY
; ALLOCATION SUPPORT.

* ARE YOU BUILDING AN RSX-11S SYSTEM? [Y/N]: **N**

The following question concerning terminal driver support
appears only if an RSX-11S system is being generated.

* DO YOU WANT TERMINAL DRIVER SUPPORT? [Y/N]:

If an RSX-11S system is being generated, then the next four
queries do not appear.

;
; FAILURE TO INCLUDE THIS OPTION ELIMINATES ALL THE SERVICES
; DESCRIBED IN THE RSX-11 I/O OPERATIONS REFERENCE MANUAL. SINCE
; DEC SUPPLIED SOFTWARE MAKES USE OF THESE SERVICES, THEIR
; ELIMINATION IS NOT RECOMMENDED.

* **DO YOU WANT FILES-11 ACP SUPPORT? [Y/N]: **Y**

; THIS OPTION IS REQUIRED IF YOU WANT SUPPORT FOR RMS-11.

* DO YOU WANT RMS RECORD LOCKING AND PLACEMENT CONTROL SUPPORT? [Y/N]: **Y**

; IF TASKS ARE TO BE DISPLACED FROM A PARTITION TO YIELD THE
; PROCESSOR RESOURCES TO A TASK OF HIGHER PRIORITY ABLE TO USE
; THE PARTITION, THEN CHECKPOINTING IS REQUIRED.

* **DO YOU WANT CHECKPOINTING? [Y/N]: **Y**

For large systems, checkpointing may not be required if MCR,
TKN, and FCP each operate in a dedicated partition; thus,
checkpointing may be omitted (checkpointing is, however,
strongly recommended). Note that, in a minimum system,
these tasks must run in the same partition and, therefore,
checkpointing is required.

If checkpointing is selected, then the following question is
asked, and the nonresident task query does not appear.

SYSGEN DIALOGUE DETAILS

; SELECTION OF THIS OPTION ALLOWS CHECKPOINTING INTO A SYSTEM
; CHECKPOINT FILE RATHER THAN REQUIRING SPACE IN EACH TASK.

If selected, system checkpoint files are allocated by an MCR command. The first checkpoint file allocated becomes the primary file and so forth.

* DO YOU WANT DYNAMIC CHECKPOINT ALLOCATION? [Y/N]: Y

; IF SELECTED, THE SYSTEM WILL CONTAIN A TASK LOADER. NOT
; INCLUDING THIS LOADER MEANS TASKS MUST BE PERMANENTLY RESIDENT
; IN THE GENERATED SYSTEM.

* **DO YOU WANT NON-RESIDENT TASK SUPPORT? [Y/N]: Y

; REQUIRED IF THE USER-TAILORED SYSTEM HAS A
; MEMORY MANAGEMENT UNIT FOR WHICH RSX-11M/S SUPPORT IS DESIRED.

* ARE YOU BUILDING A MAPPED SYSTEM? [Y/N]: Y

If you are not building a mapped system, the next five questions are omitted.

For unmapped systems, the next questions displayed begin with address checking.

MAPPED

; THIS OPTION ALLOWS AS MANY TASKS AS WILL FIT IN A PARTITION TO
; BE SIMULTANEOUSLY RESIDENT. THE ALLOCATION OF PARTITION MEMORY
; IS AUTOMATIC AND IS CARRIED OUT DYNAMICALLY BY THE RSX-11M
; EXECUTIVE.

* DO YOU WANT DYNAMIC MEMORY ALLOCATION SUPPORT? [Y/N]: Y

If dynamic memory allocation is selected, the next question is also asked.

; AUTOMATIC MEMORY COMPACTION MINIMIZES THE EFFECTS OF
; FRAGMENTATION IN DYNAMICALLY ALLOCATED PARTITIONS. IT IS
; INVOKED WHEN FREE SPACE EXISTS BETWEEN RESIDENT
; NONCHECKPOINTABLE TASKS AND TASKS ARE WAITING TO BE LOADED
; INTO THE PARTITION.

* DO YOU WANT AUTOMATIC MEMORY COMPACTION? [Y/N]: Y

Memory compaction is implemented as a nonresident task called the Shuffler. Whenever it is necessary to compact memory in a partition, the Shuffler is automatically loaded and proceeds to checkpoint tasks and move them toward the front of the partition in an attempt to provide better memory utilization.

; THE MEMORY MANAGEMENT DIRECTIVES PROVIDE TASKS WITH A PROTECTED
; MECHANISM BY WHICH THEY CAN DYNAMICALLY CREATE AND DELETE
; COMMON BLOCKS AND DYNAMICALLY MODIFY THEIR PHYSICAL ADDRESS
; SPACE MAPPING.

* DO YOU WANT THE MEMORY MANAGEMENT DIRECTIVES? [Y/N]: Y

The memory management directives are available only on a mapped system. If selected, the next two questions are asked.

SYSGEN DIALOGUE DETAILS

; THESE DIRECTIVES ALLOW ONE TASK TO SEND TO ANOTHER TASK A
; REFERENCE TO AN AREA WITHIN A PARTITION. THE RECEIVER TASK IS
; GIVEN A SPECIFIED ACCESS ALLOWING IT TO SUBSEQUENTLY MAP TO OR
; DELETE THE PARTITION.

* DO YOU WANT THE SEND/RECEIVE BY REFERENCE DIRECTIVES? [Y/N]: Y

; THIS DIRECTIVE ALLOWS A TASK TO OBTAIN A SNAPSHOT OF ITS
; CURRENT VIRTUAL-TO-PHYSICAL ADDRESS SPACE MAPPING.

* DO YOU WANT THE GET MAPPING CONTEXT DIRECTIVE? [Y/N]: Y
UNMAPPED

; IF ADDRESS CHECKING IS INCLUDED, USER GENERATED ADDRESSES
; PASSED IN EXECUTIVE DIRECTIVES WILL BE SUBJECT TO BOUNDARY,
; ALIGNMENT, AND MODULUS CHECKS.

* DO YOU WANT ADDRESS CHECKING? [Y/N]:

This feature is automatically included if the target system contains a memory management unit. If memory management support is included, this question is omitted.

; I/O RUNDOWN INSURES THE INTEGRITY OF AN RSX-11M SYSTEM BY
; MAKING SURE ALL OUTSTANDING TASK RELATED I/O OPERATIONS ARE
; CLEANED UP BEFORE ALLOWING THE TASK TO EXIT. OMISSION OF THIS
; FEATURE SHOULD BE CAREFULLY CONSIDERED.

* **DO YOU WANT I/O RUNDOWN? [Y/N]:

This feature is automatically included if the target system contains a memory management unit. If memory management support is included, this question is omitted.

Processing continues here whether the system is mapped or unmapped.

MAPPED AND UNMAPPED

The following two options are available only with RSX-11M systems, they are not displayed if you are building an RSX-11S system.

; MULTI-USER PROTECTION PREVENTS ONE USER FROM INTERFERING WITH
; THE OPERATION OF ANOTHER BY PROVIDING FOR PUBLIC AND PRIVATE
; DEVICE OWNERSHIP AND LOGON/LOGOFF WITH PASSWORD PROTECTION.
; SELECTION OF THIS FEATURE AUTOMATICALLY INCLUDES TERMINAL
; DRIVER SUPPORT FOR READ WITH SPECIAL TERMINATOR, BREAKTHROUGH
; WRITE, AND READ WITH NO ECHO.

* DO YOU WANT MULTI-USER PROTECTION SUPPORT? [Y/N]: Y

It is suggested that you have a minimum of 32K words of memory to select multi-user protection support.

; SELECTION OF ANSI MAGTAPE SUPPORT PROVIDES VOLUME AND FILE
; LABELING WHICH CONFORMS TO THE ANSI STANDARD FOR INDUSTRY
; COMPATIBLE TAPE. THIS OPTION REQUIRES EXECUTIVE AST SUPPORT.

* DO YOU WANT ANSI MAGTAPE ACP SUPPORT? [Y/N]: Y

The following options are available for both RSX-11M and RSX-11S systems.

SYSGEN DIALOGUE DETAILS

; USER MODE DIAGNOSTIC SUPPORT ENABLES THE EXECUTIVE AND DEVICE
; DRIVERS TO SERVICE SPECIAL I/O FUNCTIONS AND RETURN ADDITIONAL
; DEVICE STATUS INFORMATION AS REQUIRED BY ONLINE DIAGNOSTIC
; TASKS.

* DO YOU WANT SUPPORT FOR ONLINE, USER MODE DIAGNOSTICS? [Y/N]: ~~N~~ Y

; LOADABLE DEVICE DRIVER SUPPORT ALLOWS MOST DEVICE DRIVERS TO BE
; REMOVED FROM THE EXECUTIVE. THEY CAN BE LOADED AND UNLOADED
; ALMOST AT WILL. AT THIS POINT ONLY THE PROCESS CONTROL DRIVERS
; (UDC, ICS/ICR, AND DRS/DSS DRIVERS) AND THE VT11/VS60 GRAPHICS
; DRIVER CAN NOT BE LOADABLE. LOADING OF THE TERMINAL DRIVER IS
; RESERVED FOR VMR LOAD.

; NOTE: LOADABLE DRIVER SUPPORT IN RSX-11S IS LIMITED TO VMR.

* *DO YOU WANT LOADABLE DEVICE DRIVER SUPPORT? [Y/N]: Y

; AS DISTRIBUTED, THE RSX-11M SOURCE DISK PROVIDES FOR THE
; GENERATION OF AN RSX-11M OR RSX-11S EXECUTIVE THAT CONTAINS
; SUPPORT FOR NETWORK COMMUNICATIONS. IN ORDER TO GENERATE SUCH
; A SYSTEM YOU MUST HAVE THE APPROPRIATE NETWORK SOFTWARE
; LICENSE.

* DO YOU WANT NETWORK ACP SUPPORT? [Y/N]: N

If you select Network ACP support, the following two questions are asked.

* DO YOU WANT DECNET VERSION 2 SUPPORT? [Y/N]:

If you select DECNET Version 2 support, the following is displayed. Otherwise, it is omitted.

; WITH THE ADDITION OF VERSION 2 DECNET SUPPORT IT IS NECESSARY
; TO SPECIFY THE HIGHEST VECTOR ADDRESS IN THE SYSTEM SO THAT
; ADEQUATE SPACE IS RESERVED FOR INTERRUPT VECTORS, SINCE V2
; DECNET DEVICES WILL BE SPECIFIED DURING NETGEN RATHER THAN
; SYSGEN.

* WHAT IS THE HIGHEST INTERRUPT VECTOR ADDRESS? [O R: 300-774]:

* DO YOU WANT DECNET VERSION 1 SUPPORT? [Y/N]:

Network software provides the capability of simultaneously operating tasks on different systems to establish logical communication links, and to exchange data. If this option is not selected, the next seven queries are omitted.

Users should not attempt to answer the network questions without consulting the RSX-11 DECNET-11 Programmer's Guide and Reference Manual.

If Network ACP support and DECNET version 1 support is selected, the following ten questions, pertinent only to network support, are asked.

If you do not select DECNET support, the next query displayed appears under the heading ALL SYSTEMS.

NETWORK ACP SUPPORT ONLY

; SELECTION OF THIS OPTION PROVIDES SUPPORT FOR THE LOADING OF
; TASKS FROM A MASS STORAGE DEVICE ON ANOTHER SYSTEM.

SYSGEN DIALOGUE DETAILS

* DO YOU WANT SUPPORT FOR REMOTE TASK LOADING? [Y/N]:

This question is asked only for RSX-11S systems. If selected, the next question is also asked.

; THIS OPTION ALLOWS TASKS THAT ARE REMOTELY LOADED TO BE
; CHECKPOINTED BY HIGHER PRIORITY TASKS. CHECKPOINT STORAGE
; SPACE IS PROVIDED ON THE HOST MASS STORAGE DEVICE.

* DO YOU WANT REMOTE TASK CHECKPOINTING SUPPORT? [Y/N]:

Remote task checkpointing on slow communication links can be a lengthy process. Selection of this feature should be given careful thought.

The following is displayed only if you selected DECNET Version 1 support.

; IN AN RSX-11M SYSTEM THE NETWORK ACP MAY BE OVERLAID.
; OVERLAYING CONSERVES APPROXIMATELY 1K OF MEMORY AT THE COST OF
; A SLIGHT DEGRADATION IN PERFORMANCE.

* SHOULD THE NETWORK ACP BE OVERLAID? [Y/N]:

The above question is asked only for RSX-11M systems. The network ACP cannot be overlaid in an RSX-11S system.

The following question is displayed only if you are generating a mapped system.

; IN A MAPPED SYSTEM, THE NETWORK ACP CAN MAP OVER THE I/O PAGE.
; THIS ALLOWS THE ACP TO HAVE AN EXTRA 4K OF BUFFERS, HOWEVER,
; IT RESULTS IN A SLIGHT DEGRADATION OF SYSTEM I/O PERFORMANCE.

* SHOULD THE NETWORK ACP MAP OVER THE I/O PAGE? [Y/N]:

; THIS HARDWARE OPTION PROVIDES EFFICIENT CALCULATION OF MESSAGE
; BLOCK CHECK CHARACTERS.

* DOES THE TARGET SYSTEM HAVE A KG11 CRC OPTION? [Y/N]:

This option cannot be selected unless the hardware is actually present.

; NETWORK MESSAGE TIMEOUT IS PROVIDED TO DETECT COMMUNICATION
; LINK AND REMOTE SYSTEM FAILURES. TYPICAL TIMES (IN SECONDS)
; ARE ON THE ORDER OF TWICE THE LONGEST MESSAGE ROUND TRIP TIME.

* WHAT IS TIMEOUT PERIOD FOR NETWORK MESSAGES? [D R:3.-60.]:

; TYPICAL NETWORK MESSAGE LENGTHS ARE 80. TO 128. BYTES.

* WHAT IS THE MAX NETWORK MESSAGE SIZE IN BYTES? [D R:64.-528.]:

; THE COMMUNICATION BETWEEN TASKS IN A NETWORK IS VIA LOGICAL
; CHANNELS. ONE LOGICAL CHANNEL IS REQUIRED FOR EACH PAIR OF
; COMMUNICATING TASKS.

* HOW MANY CHANNELS CAN BE ACTIVE SIMULTANEOUSLY? [D R:1.-254.]:

ALL SYSTEMS

; IF YOU INTEND TO USE THE K-SERIES LAB PERIPHERALS SUPPORT
; ROUTINES, THE LP111 LAB. PERIPHERAL ACCELERATOR, THE PRINT

SYSGEN DIALOGUE DETAILS

; SPOOLER, THE FORTRAN ISA PROCESS CONTROL SUBROUTINE CALLS,
; ANSI MAGTAPE, OR UNSOLICITED TERMINAL AST'S, THEN
; ASYNCHRONOUS SYSTEM TRAP PROCESSING SUPPORT IS REQUIRED.
; SEE THE EXECUTIVE REFERENCE MANUAL FOR A DETAILED DESCRIPTION
; OF THE AST FACILITY PROVIDED IN RSX-11M/S.

* DO YOU WANT AST SUPPORT? [Y/N]: Y

AST support is included automatically if Floating Point Processor, ANSI magtape, or network support is selected. If ANSI magtape or network support is selected, this question is omitted.

; ABNORMAL TASK TERMINATION AND DEVICE NOT READY MESSAGES ARE
; AUTOMATICALLY PRODUCED BY THE SYSTEM IF THIS OPTION IS
; SELECTED. THIS OPTION IS REQUIRED IF PMD SUPPORT IS DESIRED.

* **DO YOU WANT TASK TERMINATION AND DEVICE NOT READY MESSAGES? [Y/N]: Y

If this option is included in an RSX-11M/S system, then the Task Termination Notification Task (TKN) must also be included in the system for the messages to actually be printed.

; IF THE POWER FAILS AND THIS OPTION IS INCLUDED,
; SYSTEM OPERATION IS
; AUTOMATICALLY COMMENCED WHEN POWER IS RESTORED.

* DO YOU WANT POWERFAIL RECOVERY? [Y/N]: Y

; REQUIRED IF DEC-SUPPLIED PROGRAM DEVELOPMENT SOFTWARE (I.E.,
; TKB, MAC, ETC.) IS TO BE RUN.

* **DO YOU WANT GET PARTITION PARAMETERS DIRECTIVE? [Y/N]: Y

; THIS DIRECTIVE PROVIDES THE CAPABILITY TO READ THE PROCESSOR
; SWITCH REGISTER AND RETURN ITS CONTENTS TO THE REQUESTING TASK.
; NOTE THAT SOME PROCESSORS DO NOT HAVE A CONSOLE SWITCH REGISTER
; AND, THEREFORE, CANNOT SUPPORT THIS DIRECTIVE.

* DO YOU WANT GET SENSE SWITCHES DIRECTIVE? [Y/N]: ~~Y~~ N

; REQUIRED IF DEC-SUPPLIED PROGRAM DEVELOPMENT SOFTWARE (I.E.
; TKB, MAC, ETC.) IS TO BE RUN.

* **DO YOU WANT GET TASK PARAMETERS DIRECTIVE? [Y/N]: Y

; THESE DIRECTIVES PROVIDE THE CAPABILITY FOR CO-OPERATING TASKS
; TO COMMUNICATE VIA SYSTEM MAINTAINED MESSAGE QUEUES. IF THE
; TARGET SYSTEM WILL CONTAIN THE PRINT SPOOLER, OR IF LP11-K
; POWERFAIL SUPPORT OR ANSI MAGTAPE SUPPORT IS DESIRED,
; THIS OPTION MUST BE INCLUDED.

* DO YOU WANT SEND/RECEIVE DIRECTIVES? [Y/N]: Y

; THIS DIRECTIVE ALLOWS A TASK TO ALTER ITS OWN OR ANOTHER TASK'S
; PRIORITY AT EXECUTION TIME. ITS INCLUSION WILL ALSO ALLEVIATE
; THE PROBLEMS WITH ABORTED, NON-RESIDENT TASKS.

* DO YOU WANT ALTER PRIORITY DIRECTIVE? [Y/N]: Y

; THIS DIRECTIVE ALLOWS A TASK TO CONNECT AN INTERRUPT VECTOR
; TO AN INTERRUPT SERVICE ROUTINE IN ITS OWN SPACE. IT IS REQUIRED
; IF K-SERIES LABORATORY PERIPHERALS SUPPORT IS DESIRED.

SYSGEN DIALOGUE DETAILS

* DO YOU WANT CONNECT TO INTERRUPT VECTOR DIRECTIVE? [Y/N]: Y

If selected, you must specify the highest vector you plan to use. The following note and query is displayed only if the connect to interrupt vector directive is selected.

; NOTE: DUE TO AN EXECUTIVE RESTRICTION, YOU ARE
; REQUIRED TO HAVE SUPPORT FOR LOADABLE DRIVERS
; IF YOU DESIRE CONNECT TO INTERRUPT VECTOR
; DIRECTIVE SUPPORT. THIS HAS BEEN SELECTED
; AUTOMATICALLY.
;
; SINCE THE VECTOR ADDRESSES OF DEVICES THAT WILL BE CONNECTED
; WITH THIS FACILITY ARE NOT SPECIFIED DURING SYSGEN, YOU MUST
; RESERVE SPACE FOR THEIR INTERRUPT VECTORS.

* WHAT IS THE HIGHEST INTERRUPT VECTOR ADDRESS? [O R:300-774]: 600

; THIS DIRECTIVE ALLOWS A TASK TO INCREASE ITS ADDRESS
; SPACE AT EXECUTION TIME.

* DO YOU WANT EXTEND TASK DIRECTIVES? [Y/N]: Y

This feature is only available on systems that include both checkpointing and dynamic memory allocation support; otherwise, the question is omitted.

; SELECTION OF THIS OPTION WILL SIGNIFICANTLY INCREASE SYSTEM I/O
; THROUGHPUT AT THE EXPENSE OF ADDITIONAL EXECUTIVE CODE.

* DO YOU WANT QUEUE I/O SPEED OPTIMIZATIONS? [Y/N]: Y

If Queue I/O speed optimizations are selected, the following two questions are asked.

; I/O THROUGHPUT IS ENHANCED BY PRE-ALLOCATING A NUMBER OF I/O
; PACKETS FROM THE POOL, LEAVING THEM AVAILABLE FOR QUICK USE BY
; QUEUE I/O.

* HOW MANY I/O PACKETS SHOULD BE PRE-ALLOCATED? [D R:1.-15.]: 15

; AN ADDITIONAL SPEED IMPROVEMENT IS ACHIEVED BY OPTIMIZING DATA
; TRANSFERS IN THE EXECUTIVE MODULE 'BLXIO'. ONE IMPROVEMENT IS
; THE USE OF A SERIES OF 'MOV' INSTRUCTIONS WHICH IS USED IN LIEU
; OF A LOOP. THIS IS CALLED THE DATA TRANSFER VECTOR.

* ENTER SIZE OF DATA TRANSFER VECTOR IN WORDS [D R:4.-33.]: 33

The next query is omitted if you are generating an RSX-11S system.

; THIS FACILITY OF MCR CAN SUBSTANTIALLY REDUCE THE NUMBER OF
; INSTALLED TASKS NEEDED FOR CONVENIENT SYSTEM OPERATION. SEE
; DESCRIPTION OF THE RUN COMMAND IN THE RSX-11M OPERATOR'S
; PROCEDURES MANUAL FOR DETAILS.

* * DO YOU WANT INSTALL, REQUEST, AND REMOVE ON EXIT SUPPORT? [Y/N]: Y

Support for this option is highly recommended if your system has limited dynamic memory.

The install, request, and remove on exit option is not available with RSX-11S systems.

SYSGEN DIALOGUE DETAILS

; LOGICAL DEVICE ASSIGNMENT PROVIDES THE CAPABILITY TO ASSOCIATE
; A LOGICAL NAME TO A PHYSICAL DEVICE UNIT. ASSIGNMENTS MAY BE
; MADE ON A PER TERMINAL OR SYSTEM WIDE BASIS.

* *DO YOU WANT LOGICAL DEVICE ASSIGNMENT SUPPORT? [Y/N]: Y

; THE NULL DEVICE WILL ALWAYS RETURN THE I/O STATUS FOR SUCCESS-
; FUL COMPLETION FOR AN OUTPUT REQUEST AND END-OF-FILE FOR
; AN INPUT REQUEST. IT IS VERY USEFUL TO ASSIGN IT AS THE OUTPUT
; DEVICE WHEN USING PRE-WRITTEN COMMAND FILES FOR WHICH CERTAIN
; TYPES OF OUTPUT SHOULD BE SURPPRESSED. THE NULL DEVICE DRIVER
; IS NOT LOADABLE

If you are generating an RSX-11S system without terminals or
without a disk, a null device is automatically included; a
null device is generated whether selected or not.

* *DO YOU WANT A NULL DEVICE? [Y/N]: Y

If you are generating an RSX-11S system and answered N to
terminal driver support, then the following terminal driver
questions are omitted.

* ALL SYSTEMS EXCEPT RSX-11S WITHOUT TERMINAL DRIVER SUPPORT*

; THE BASELINE TERMINAL DRIVER SUPPLIES A BASIC HALF DUPLEX
; CONNECTION TO TERMINALS INTERFACED BY A DL11, DH11/DM11-BB,
; DJ11, OR DZ11. IT IS THE SMALLEST TERMINAL DRIVER.

* *DO YOU WANT THE BASELINE TERMINAL DRIVER? [Y/N]: N

If multi-user protection support was selected earlier, then
baseline terminal support cannot be offered; this query is
omitted.

If the baseline driver is selected, the next queries, which
concern user oriented terminal drivers, are bypassed.

USER ORIENTED TERMINAL DRIVERS

; THE USER ORIENTED TERMINAL DRIVER CONTAINS THOSE FEATURES FOUND
; MOST DESIRABLE BY USERS ON A PROGRAM DEVELOPMENT SYSTEM. THE
; FOLLOWING FEATURES ARE INCLUDED:

- ✓; - AUTOMATIC CARRIAGE RETURN/LINE FEED
- ✓; - BREAKTHROUGH WRITE
- ✓; - TASK CHECKPOINTING DURING TERMINAL INPUT (NEEDS EXEC SUPPORT)
- ✓; - UNSOLICITED INPUT CHARACTER AST (NEEDS EXEC SUPPORT)
- ✓; - WRITE WITH CONTROL-O CANCELLATION
- ✓; - CONTROL-R SUPPORT
- ; - GET TERMINAL CHARACTERISTICS
- ; - GET TERMINAL DRIVER SUPPORT
- ; - SETTABLE CASE CONVERSION
- ; - READ WITH NO ECHO
- ; - READ AFTER PROMPT
- ; - SPECIAL CHARACTER LINE TERMINATOR SUPPORT
- ; - CRT RUBOUT
- ; - TERMINAL-HOST SYNCHRONIZATION
- ; - TRANSPARENT TERMINAL READ/WRITE
- ; - VARIABLE LENGTH INPUT BUFFERING

; IF MORE OR FEWER FEATURES ARE DESIRED, ANSWER NO.

*Network
Station*

SYSGEN DIALOGUE DETAILS

* DO YOU WANT THE USER ORIENTED TERMINAL DRIVER? [Y/N]:
; THE TERMINAL DRIVER NORMALLY CONVERTS A FORM FEED INTO 8 LINE
; FEEDS. CHOOSING THE NEXT OPTION WILL SUPPRESS THIS CONVERSION.
;
; IF YOU HAVE AN LA120 OR LA180S, YOU MUST ANSWER YES TO THE NEXT
; QUESTION.

* DO YOU WANT FORM FEEDS PASSED DIRECTLY TO TERMINALS? [Y/N]:

IF THE USER ORIENTED TERMINAL DRIVER IS SELECTED, THE NEXT
19 QUERIES ARE BYPASSED.

OPTIONS FOR A USER-TAILORED TERMINAL DRIVER

; WHEN THIS OPTION IS SELECTED, A CARRIAGE RETURN AND LINE FEED
; WILL BE GENERATED WHENEVER THE TERMINAL BUFFER IS FILLED EITHER
; ON OUTPUT OR ECHO. THE BUFFER SIZE MAY BE EXAMINED OR ALTERED
; BY THE 'SET /BUF' MCR COMMAND.

* DO YOU WANT AUTOMATIC CARRIAGE RETURN/LINE FEED? [Y/N]:

The following query is omitted if checkpointing support was
not included in the Executive.

; SELECTION OF THIS OPTION ALLOWS CHECKPOINTABLE TASKS TO BE
; DISPLACED FROM MEMORY DURING TERMINAL INPUT BY HIGHER PRIORITY
; TASKS. THIS OPTION REQUIRES EXECUTIVE CHECKPOINTING SUPPORT.

* DO YOU WANT TASKS TO BE CHECKPOINTABLE DURING TERMINAL INPUT? [Y/N]:

The following query is omitted if AST support was not
included in the Executive.

; WHEN ATTACHING A TERMINAL, A TASK CAN SPECIFY AN AST ENTRY
; POINT TO BE USED WHEN AN UNSOLICITED INPUT CHARACTER IS
; RECEIVED. THIS OPTION REQUIRES EXECUTIVE AST SUPPORT.

* DO YOU WANT UNSOLICITED INPUT CHARACTER AST SUPPORT? [Y/N]:

; A WRITE REQUEST ISSUED WITH CONTROL-O CANCELLATION WILL PRINT
; TO THE TERMINAL REGARDLESS OF WHETHER OR NOT THE TERMINAL
; OUTPUT HAS BEEN SUPPRESSED BY CONTROL-O.

* DO YOU WANT WRITE WITH CONTROL-O CANCELLATIONS? [Y/N]:

; TYPING CONTROL-R DURING INPUT CAUSES THE TERMINAL DRIVER TO
; SEND A CARRIAGE RETURN/LINE FEED FOLLOWED BY THE CONTENTS OF
; THE INPUT BUFFER.

* DO YOU WANT CONTROL-R SUPPORT? [Y/N]:

; ESCAPE SEQUENCES WILL BE RECOGNIZED AND TREATED AS LINE
; TERMINATORS FOR SOLICITED INPUT WHICH IS NOT READ-PASS-ALL OR
; READ-WITH-SPECIAL-TERMINATOR.

* DO YOU WANT ESCAPE SEQUENCE HANDLING? [Y/N]:

; GET MULTIPLE (TERMINAL) CHARACTERISTICS ALLOWS A TASK TO
; DETERMINE MANY OF THE PHYSICAL CHARACTERISTICS (E.G. CRT,
; VT05, SLAVED, ETC) OF INDIVIDUAL TERMINALS.

* DO YOU WANT GET MULTIPLE CHARACTERISTICS SUPPORT? [Y/N]:

; SET MULTIPLE (TERMINAL) CHARACTERISTICS ALLOWS A TASK TO SET

SYSGEN DIALOGUE DETAILS

; AND RESET MANY OF THE CHARACTERISTICS (E.G. CRT, VT05, ETC) OF
; ITS TI: TERMINAL. A PRIVILEGED TASK MAY ALSO SET THE CHARAC-
; TERISTICS OF OTHER TERMINALS IN THE SYSTEM.

* DO YOU WANT SET MULTIPLE (TERMINAL) CHARACTERISTICS SUPPORT? [Y/N]: Y

; GET TERMINAL DRIVER SUPPORT ALLOWS A TASK TO DETERMINE WHICH OF
; THE OPTIONAL FEATURES WERE CHOSEN FOR THE TERMINAL DRIVER AT
; SYSTEM GENERATION.

* DO YOU WANT GET TERMINAL DRIVER SUPPORT? [Y/N]: Y

; HOLD-SCREEN SUPPORT ALLOWS TERMINALS (WITH SPECIAL HARDWARE) TO
; BREAK STREAM OUTPUT INTO PAGES THAT FIT ON THE SCREEN.
; ENTERING AN UNSOLICITED CONTROL-C WILL DISABLE HOLD-SCREEN
; MODE. WHEN THIS OPTION IS SELECTED, SUPPORT FOR TRANSPARENT
; READ/WRITE IS AUTOMATICALLY INCLUDED.

* DO YOU WANT HOLD-SCREEN MODE SUPPORT? [Y/N]: Y

;
; TERMINAL INPUT IS USUSALLY FILTERED ON BOTH INPUT AND OUTPUT.
; THIS IS NECESSARY TO RECOGNIZE CONTROL CHARACTERS THAT HAVE
; SPECIAL MEANING (I.E. ALTMODE OR ESC) OR REQUIRE FILL
; CHARACTERS (I.E. CARRIAGE RETURN). THIS OPTION PROVIDES
; SUPPORT FOR I/O FUNCTIONS (IO.RAL AND IO.WAL) THAT BYPASS
; CHARACTER FILTERING AND PERMITS OUTPUT OF UP TO 32K BYTES.

* DO YOU WANT TRANSPARENT TERMINAL READ/WRITE SUPPORT? [Y/N]: Y

; NORMALLY THE TERMINAL DRIVER ACCEPTS AND ECHOS CHARACTERS AS
; RECEIVED. SELECTION OF THIS OPTION PROVIDES THE CAPABILITY TO
; SELECTIVELY ENABLE A TERMINAL SO THAT THE TERMINAL DRIVER WILL
; AUTOMATICALLY CONVERT ALL LOWER CASE INPUT TO UPPER CASE. IT
; ALSO ALLOWS THE RECOGNITION OF BRACE (175) AND TILDE (176) AS
; ASCII CHARACTERS RATHER THAN A FORM OF ALTMODE IF THE TERMINAL
; IS SET TO LOWER CASE.

* DO YOU WANT SETTABLE CASE CONVERSION FOR TERMINAL INPUT? [Y/N]: Y

; A READ AFTER PROMPT REQUEST ACTS LIKE A WRITE TO THE TERMINAL
; FOLLOWED BY A READ. HOWEVER, THE OVERHEAD OF ONE I/O REQUEST
; AND CONTEXT SWITCHING IS ELIMINATED. IN ADDITION, THE
; EXECUTION WINDOW IS REMOVED BY WHICH ONE TASK CAN PROMPT AND
; ANOTHER TASK INITIATE I/O TO THE TERMINAL BEFORE THE FIRST HAD
; TIME TO ISSUE ITS READ REQUEST, PROVIDED THE TERMINAL WAS NOT
; ATTACHED.

* DO YOU WANT READ AFTER PROMPT SUPPORT? [Y/N]: Y

Multi-user protection support includes support for
breakthrough write, read with no echo, and read with a
special terminator. Therefore, if multi-user support was
selected, the following three questions are omitted.

; A BREAKTHROUGH WRITE REQUEST ISSUED BY A PRIVILEGED TASK WILL
; AUTOMATICALLY PRINT TO THE TERMINAL REGARDLESS OF ITS CURRENT
; OUTSTANDING I/O ACTIVITY.

* DO YOU WANT BREAKTHROUGH WRITE SUPPORT? [Y/N]: Y

; READ WITH NO ECHO SUPPORT ALLOWS THE READ FUNCTIONS (IO.RLB,
; IO.RVB, AND IO.RPR) TO BE ISSUED SPECIFYING THAT THE TERMINAL
; INPUT SHOULD NOT BE ECHOED.

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* DO YOU WANT READ WITH NO ECHO SUPPORT? [Y/N]: Y

; THE LINE TERMINATORS FOR A NORMAL READ ARE ALTMODE OR CARRIAGE
; RETURN. HOWEVER, ANY CHARACTER LESS THAN 40 OCTAL AND GREATER
; THAN 174 OCTAL WILL TERMINATE A READ WITH SPECIAL TERMINATOR
; REQUEST. ESCAPE SEQUENCES CANNOT BE RECOGNIZED IN THIS MODE.
; IN ADDITION, IF THE TERMINAL HAS BEEN SET TO LOWER CASE, ONLY
; 177 OCTAL AND CHARACTERS LESS THAN 40 OCTAL ARE TERMINATORS.

* DO YOU WANT READ WITH SPECIAL TERMINATOR SUPPORT? [Y/N]: N

; WHEN THIS OPTION IS INCLUDED, RUBOUTS ENTERED ON A CRT TERMINAL
; WILL BE ECHOED AS BACKSPACE-SPACE-BACKSPACE (OR NUMBER THEREOF
; FOR TABS). THIS HAS THE AFFECT OF ERASING THE CHARACTER FROM
; THE SCREEN.

* DO YOU WANT CRT RUBOUT SUPPORT? [Y/N]: Y

; TERMINAL-HOST SYNCHRONIZATION ALLOWS OUTPUT TO BE TURNED OFF
; (CNTRL-S) AND ON (CNTRL-Q) FROM A TERMINAL. THIS MAY BE USEFUL
; FOR HIGH BAUD RATE DISPLAY TERMINALS AND IS REQUIRED IF THE
; TARGET SYSTEM CONTAINS VT50 TERMINALS WITH THE COPIER OPTION.

* DO YOU WANT TERMINAL-HOST SYNCHRONIZATION SUPPORT? [Y/N]: Y

; NORMALLY, ALL RECEIVED CHARACTERS ARE STORED IN A BUFFER IN THE
; EXECUTIVE ADDRESS SPACE UNTIL A TERMINATOR CHARACTER IS SEEN.
; AT THAT TIME THE CONTENTS OF THE BUFFER ARE COPIED INTO THE
; REQUESTING TASK'S INPUT BUFFER. SELECTION OF THIS OPTION WILL
; PLACE THE INPUT CHARACTERS DIRECTLY INTO THE TASK BUFFER WHEN
; THEY ARE RECEIVED, PROVIDED THE TASK IS NOT CHECKPOINTABLE.

* DO YOU WANT USER TERMINAL INPUT BUFFERING? [Y/N]: Y

; NORMALLY, ALL TERMINAL DRIVER INPUT BUFFERS ARE 80 BYTES LONG.
; THIS IMPLICITLY LIMITS THE SIZE OF THE MAXIMUM TERMINAL INPUT
; REQUEST AS WELL AS THE SIZE OF THE MINIMUM BUFFER ALLOCATION
; FROM DYNAMIC MEMORY. VARIABLE LENGTH BUFFERING ALLOCATES THE
; BUFFERS JUST LARGE ENOUGH TO SATISFY THE READ REQUESTS. THE
; LARGEST BUFFER MAY BE 255 BYTES LONG.

* DO YOU WANT VARIABLE LENGTH TERMINAL INPUT BUFFERING? [Y/N]: Y

; THE LA30P DECWRITER IS CONNECTED TO THE PDP-11 VIA A SINGLE
; BUFFERED INTERFACE. THEREFORE, THE SECOND OF TWO QUICKLY TYPED
; CHARACTERS MAY BE DISCARDED BY THE TERMINAL DRIVER UNLESS THIS
; OPTION IS SELECTED. ALL OTHER COMBINATIONS OF DEC TERMINALS
; AND INTERFACES ARE PROPERLY SUPPORTED BY THE TERMINAL DRIVER.
; THIS OPTION SHOULD BE CHOSEN ONLY IF YOU HAVE AN LA30P
; TERMINAL.

* DO YOU WANT LA30P SUPPORT? [Y/N]: N

ALL SYSTEMS

; IT IS POSSIBLE TO GENERATE AN EXECUTIVE LARGER THAN 16K TO
; INCREASE THE SIZE OF THE EXECUTIVE DYNAMIC STORAGE REGION.
; DOING THIS WILL REDUCE THE SIZE OF PRIVILEGED TASKS WHICH MAP
; INTO THE EXECUTIVE TO 8K.

* DO YOU WANT SUPPORT FOR A 20K EXECUTIVE? [Y/N]:

; ROUND ROBIN SCHEDULING PROVIDES THE CAPABILITY FOR A GROUP

Y
2780

SYSGEN DIALOGUE DETAILS

; OF TASKS WITHIN A RANGE OF PRIORITIES TO SHARE THE AVAILABLE
; PROCESSING TIME. EACH PRIORITY CLASS WITHIN THE RANGE IS ROUND
; ROBIN SCHEDULED AT EACH SCHEDULE INTERVAL (TIME SLICE).

* DO YOU WANT EXECUTIVE LEVEL ROUND ROBIN SCHEDULING? [Y/N]: Y

Round-robin scheduling refers to the algorithm whereby each task of a group of tasks is successively given preference in allocating available processor time. The actual algorithm used in RSX-11M is to locate the first task within each priority class that is not blocked from executing, and to move that task to the end of its respective priority class. Compute-bound tasks tend to actually round robin, whereas I/O-bound tasks tend to remain at the front of their respective priority class.

If Executive level round-robin scheduling is selected, you must specify a scheduling interval and the range of priority classes to be considered. Therefore, the following three questions are asked.

If not selected, the next three questions are omitted.

; ROUND ROBIN SCHEDULING IS EXECUTED ON A PERIODIC BASIS.
; A TYPICAL SCHEDULING INTERVAL IS ON THE ORDER OF 100
; MILLISECONDS (6 CLOCK TICKS FOR A 60 CYCLE LINE FREQUENCY
; CLOCK).

* ENTER LENGTH OF SCHEDULE INTERVAL IN TICKS [D R:1.-1000. D:6]: 6

; ROUND ROBIN SCHEDULING IS EXECUTED FOR A RANGE OF PRIORITY
; CLASSES. TYPICAL RANGES ARE 1. TO 100.

* ENTER HIGHEST PRIOR. CLASS TO BE CONSIDERED [D R:1.-249.]: 100

* ENTER LOWEST PRIOR. CLASS TO BE CONSIDERED [D R:1.-x]: ? 1

Note that x above is the value of the previous answer.

To Round-Robin schedule a system that is executing multiple copies of the MCR indirect command processor (AT.), the response to the above question must be 1.

The following option is not available on systems that do not include checkpointing. Therefore, if you have not previously selected checkpointing, the next queries concerning disk swapping are omitted.

; THE DISK SWAPPING ALGORITHM PROVIDES FOR THE VARIATION OF A
; RESIDENT TASK'S EFFECTIVE PRIORITY WHEN IT IS BEING CONSIDERED
; FOR CHECKPOINTING. A TASK'S EFFECTIVE PRIORITY IS DETERMINED
; BY BIASING ITS RUN PRIORITY WITH A POSITIVE SWAPPING PRIORITY
; EACH TIME IT IS LOADED INTO MEMORY (E.G., INITIAL TASK LOAD OR
; CHECKPOINT READ). AS THE TASK CONTINUES TO RESIDE IN MEMORY,
; ITS SWAPPING PRIORITY BECOMES NEGATIVE, EVENTUALLY REACHING A
; LOWER BOUND; IT IS THIS BIAS WHICH IS USED TO DETERMINE
; EFFECTIVE PRIORITY. EVENTUALLY, THE TASK BECOMES ELIGIBLE FOR
; CHECKPOINTING BY TASKS OF EQUAL PRIORITY WHICH ARE NOT RESIDENT
; (OR BY LOWER PRIORITY TASKS WITHIN THE SPECIFIED RANGE).

* DO YOU WANT EXECUTIVE LEVEL DISK SWAPPING? [Y/N]: Y ?

If this option is not selected, the next two queries are omitted.

task statement

SYSGEN DIALOGUE DETAILS

; SWAPPING PRIORITIES ARE DECREMENTED ON A PERIODIC BASIS. A
; TYPICAL TIME INTERVAL IS ON THE ORDER OF 500 MILLISECONDS (30
; CLOCK TICKS FOR A 60 CYCLE FREQUENCY CLOCK). TYPICALLY, THE
; SWAPPING INTERVAL SHOULD BE AT LEAST 5 TIMES THE ROUND ROBIN
; SCHEDULING INTERVAL.

* ENTER LENGTH OF SWAPPING INTERVAL IN TICKS [D R:1.-5000. D:5.]: 30

; WITH A SWAPPING PRIORITY OF "S", A TASK RUNNING AT PRIORITY "P"
; WILL HAVE AN EFFECTIVE PRIORITY RANGE (FOR CHECKPOINTING) FROM
; "P+S" TO "P-S" AS LONG AS IT RESIDES IN MEMORY. THE SWAPPING
; PRIORITY DETERMINES THE RANGE OVER WHICH LOWER PRIORITY TASKS
; MAY CHECKPOINT HIGHER ONES: THE LARGER THE SWAPPING PRIORITY,
; THE GREATER THE RANGE.
;
; A TYPICAL VALUE FOR THIS PARAMETER IS 5.

* WHAT IS THE SWAPPING PRIORITY? [D R:1.-20. D:5.]: 5

; ADDITION OF A USER WRITTEN DRIVER REQUIRES THAT ADEQUATE SPACE
; BE ALLOCATED FOR INTERRUPT VECTORS DURING THE ASSEMBLY OF THE
; GENERATED EXECUTIVE. ACTUAL DRIVER INCLUSION OCCURS WHEN THE
; TARGET EXECUTIVE IS BUILT.

* ARE YOU PLANNING TO INCLUDE A USER WRITTEN DRIVER? [Y/N]: Y

If a user-written driver is not being incorporated, the next three queries are omitted.

* WHAT IS THE HIGHEST INTERRUPT VECTOR ADDRESS? [O R: x-774]: 606

The low range for the highest interrupt vector address x is either 300 or the value that was specified in the response to the query concerning the highest interrupt vector you plan to use. If your response is greater than the low range argument, the highest interrupt vector address is then increased. This is done to prevent the Executive stack from overwriting the vector addresses (including the vector addresses needed for user-written drivers).

; THE EXECUTIVE ROUTINES \$GTWRD AND \$PTWRD ARE USED BY DRIVERS TO
; TRANSFER A WORD FROM (OR TO) A USER SPECIFIED BUFFER. THEIR
; INCLUSION IS OPTIONAL SINCE ONLY ONE OR TWO OF THE DEC SUPPLIED
; DRIVERS USE THEM.

* DO YOU REQUIRE THE EXECUTIVE ROUTINE \$GTWRD? [Y/N]: Y

* DO YOU REQUIRE THE EXECUTIVE ROUTINE \$PTWRD? [Y/N]: Y

; THE EXECUTIVE DEBUGGING TOOL PROVIDES A SUBSET ODT-11 THAT RUNS
; AS A PART OF THE RSX-11M EXECUTIVE. THIS TOOL ALLOWS
; INTERACTIVE DEBUGGING OF EXECUTIVE MODULES, I/O DRIVERS, AND
; INTERRUPT SERVICE ROUTINES. SELECTION OF THIS OPTION ALSO
; INCLUDES CONSISTENCY CHECK CODE IN THE DYNAMIC MEMORY ROUTINES.

* DO YOU WANT TO INCLUDE THE EXECUTIVE DEBUGGING TOOL? [Y/N]: Y

See the RSX-11M Guide to Writing an I/O Driver for a description of XDT. At the expense of additional overhead code in the Executive module CORAL, selection of this option also includes consistency checking when deallocating dynamic memory. Since errors in deallocation (via I/O done, etc.) are common causes of system crashes, the overhead in a system debugging situation may be justified.

SYSGEN DIALOGUE DETAILS

; IF THE SYSTEM CRASHES AND THIS OPTION IS INCLUDED, THE
; EXECUTIVE STACK AND REGISTERS WILL BE DUMPED TO THE SELECTED
; DEVICE.

* DO YOU WANT REGISTER AND STACK DUMP AT SYSTEM CRASH? [Y/N]: Y

If this option is selected, you are required to specify the CSR address of the device. Thus, the following question is asked.

If you do not select this option, the Executive stack and registers are not dumped upon a system crash. The following question is not displayed.

; THE DEVICE ON WHICH THE STACK AND REGISTER DUMP APPEARS
; MUST BE A TERMINAL OR LINE PRINTER COMPATIBLE DEVICE; THAT
; IS, IT MUST RECEIVE A SINGLE BYTE AT A TIME. THE NORMAL
; DEVICE IS THE CONSOLE TERMINAL WHICH HAS A CSR ADDRESS OF
; 177564.

* ENTER DUMP DEVICE CSR ADDRESS [O R:160000-177700 D:177564]: ↵

; SELECTION OF THIS OPTION INCLUDES CODE TO DUMP MEMORY TO
; SECONDARY STORAGE FOR LATER ANALYSIS BY THE CRASH DUMP
; ANALYSIS PROGRAM. THE CRASH DUMP DEVICES SUPPORTED ARE:
; DT, DK, MT, AND MM.

* DO YOU WANT CRASH DUMP ANALYSIS SUPPORT? [Y/N]: Y

If this option is selected, you must specify the CSR address of the output device, the device mnemonic on which memory is to be dumped, its CSR address, and the physical unit number. Thus, the following four questions are asked.

If not selected, the next four questions are not displayed.

; THE DEVICE ON WHICH THE CRASH NOTIFICATION APPEARS MUST BE A
; PAPER TAPE, TELETYPE, OR LINE PRINTER COMPATIBLE DEVICE; THAT
; IS, THE DEVICE MUST RECEIVE A SINGLE BYTE AT A TIME. THE
; NORMAL CRASH OUTPUT DEVICE IS THE CONSOLE TERMINAL WHICH HAS A
; CSR ADDRESS OF 177564.

; IN RESPONSE TO THE NEXT QUESTION, ENTER THE CSR ADDRESS OF THE
; DEVICE ON WHICH THE CRASH NOTIFICATION IS TO APPEAR.

* ENTER OUTPUT DEVICE CSR ADDRESS [O R: 160000-177700 D:177564]: ↵

; MEMORY CAN BE DUMPED ONTO ANY OF THE FOLLOWING DEVICES:
; DT, DK, MT, MM

* ENTER CRASH MEMORY DUMP DEVICE MNEMONIC? [S]: MM

In the next query, it is assumed that DT was entered as the memory dump device.

* WHAT IS ITS CSR ADDRESS? [O R: 160000-177700 D:177342]: 172 440

Since it was assumed that DT was the memory dump device, the default argument for the CSR address is 177342. Note that in an actual SYSGEN, the default argument is the standard CSR address of your memory dump device.

SYSGEN DIALOGUE DETAILS

* WHAT IS THE PHYSICAL UNIT NUMBER OF CRASH UNIT? [O R: 0-7 D:0]: ϕ

The panic dump routine is not available if crash dump analysis support was selected. Therefore, if you selected crash dump analysis support, the following questions are omitted.

; SELECTION OF THIS OPTION INCLUDES CODE TO DUMP SELECTED
; PORTIONS OF MEMORY TO A HARD COPY DEVICE. THE DEVICE MUST
; RECEIVE A BYTE AT A TIME (I.E. A TERMINAL OR LINE PRINTER).
; THE DEFAULT DEVICE IS THE LINE PRINTER.

* DO YOU WANT THE PANIC DUMP ROUTINE? [Y/N]:

If this option is omitted and a system failure should occur, it may not be possible for the user to capture vital data on the state of the system at failure time.

The panic dump routine is normally used in debugging new drivers or privileged tasks. It provides a means of generating a formatted dump of memory on a line printer or a terminal. If the dump routine query is not selected, then the next two queries will not appear.

* ENTER THE DUMP DEVICE CSR ADDR? [O R: 160000-177700 D:177514]:

The device that the formatted dump appears must be a paper tape, terminal, or line printer compatible device; the device must transmit a single byte at a time. The normal crash dump device is a line printer (CSR address 177514).

; IF YOUR PROCESSOR DOES NOT HAVE A CONSOLE SWITCH REGISTER, THE
; PANIC DUMP ROUTINE MUST INPUT ITS DUMP ADDRESS LIMITS FROM
; LOCATION ZERO RATHER THAN FROM THE CONSOLE SWITCHES.

* DOES YOUR PROCESSOR HAVE A CONSOLE SWITCH REGISTER? [Y/N]:

Error logging is not available on an RSX-11S system; the following is not displayed.

The error logging queries are only displayed if you are generating an RSX-11M system.

; SELECTION OF ERROR LOGGING WILL CAUSE DISK AND TAPE DEVICE
; ERRORS TO BE INTERCEPTED AND INFORMATION CONCERNING THEM TO BE
; WRITTEN INTO A DISK FILE FOR LATER ANALYSIS. NOTE THAT THIS
; OPTION AUTOMATICALLY INCLUDES SUPPORT FOR CHECKPOINTING AND THE
; SEND/RECEIVE DIRECTIVES.

* DO YOU WANT DEVICE ERRORS AND TIMEOUTS LOGGED? [Y/N]: Y

; SELECTION OF THIS OPTION ALLOWS THE EXECUTIVE TO DETECT THE
; OCCURRENCE OF TRAPS TO UNUSED INTERRUPT VECTORS AND TO STORE
; INFORMATION ABOUT THEM IN A FILE FOR LATER ANALYSIS. INCLUDING
; THIS OPTION ALSO REQUIRES SUPPORT FOR SEND/RECEIVE DIRECTIVES
; AND CHECKPOINTING.

* DO YOU WANT UNDEFINED INTERRUPTS LOGGED? [Y/N]: Y

; SELECTION OF THIS OPTION WILL CAUSE CACHE AND MEMORY PARITY
; ERROR TRAPS FROM USER TASKS TO BE INTERCEPTED WITH INFORMATION
; CONCERNING THEM TO BE WRITTEN INTO A FILE FOR LATER ANALYSIS.
; NOTE THAT THIS OPTION ALSO INCLUDES SUPPORT FOR PARITY MEMORY,
; CHECKPOINTING, AND THE SEND/RECEIVE DIRECTIVES.

SYSGEN DIALOGUE DETAILS

* DO YOU WANT PARITY ERROR TRAPS LOGGED? [Y/N]: Y

; A NON ZERO RESPONSE TO THIS QUERY IS REQUIRED. A MINIMUM OF
; 256 WORDS WILL BE ACCEPTED TO INSURE MINIMUM OPERATIONS. 1024
; WORDS IS A REASONABLE ESTIMATE FOR ADEQUATE PERFORMANCE OF A
; SET OF USER TASKS MAKING FULL USE OF THE BASELINE SYSTEM.
;
; RESPONSE LIMITS: 256.-16384. MINUS SIZE OF EXECUTIVE

* **ENTER SIZE OF DYN. STORAGE REGION IN WORDS (D R: 256.-16384.):

The amount of dynamic memory needed depends on the configuration of the machine and the number of tasks installed. See Appendix B for a complete description. Keep in mind that it is advisable to answer this question conservatively. This will ensure that the size of your executive will not exceed pre-established size goals. Once the Executive is built, additional pool may be allocated when configuring the system with VMR.

; IF SELECTED, THE SYSTEM WILL, WHEN IDLE, CAUSE THE DATA LIGHTS
; TO FLICKER IN A PRONOUNCED CIRCULAR ROTATION. THE OPTION
; FUNCTIONS PROPERLY ONLY ON PDP-11/45/50/55/70 SYSTEMS.

* DO YOU WANT ROTATING PATTERN IN DATA LIGHTS? [Y/N]: N

; END EXECUTIVE SERVICE OPTIONS.

; BEGIN PROCESSOR OPTIONS.

; THE PDP-11/70 REQUIRES ADDITIONAL EXECUTIVE SUPPORT IF YOU
; WISH TO UTILIZE MEMORY ABOVE 124K.

* IS YOUR TARGET PROCESSOR A PDP-11/70? [Y/N]: Y

; THE MINIMUM MEMORY IS 16K FOR AN RSX-11M SYSTEM AND 8K FOR AN
; RSX-11S SYSTEM. THE MAXIMUM MEMORY SIZE IS 1920K FOR AN
; RSX-11M SYSTEM AND 124K FOR AN RSX-11S SYSTEM. IN ORDER TO
; UTILIZE MEMORY ABOVE 28K THE TARGET SYSTEM MUST CONTAIN A
; MEMORY MANAGEMENT UNIT.

If your target processor is not an 11/70, the high value for the range argument is 124K.

If it is an 11/70, the high value is 1920K.

Regardless of the target processor, if you have not selected memory management, the maximum size of physical memory is 28K.

In the next question, it is assumed that the processor is an 11/70, the memory management option was selected, and an RSX-11M system is being generated.

* ENTER SIZE OF PHYS. MEMORY IN 1024 WORD BLOCKS [D R: 16.-1920.]: 192

Note that the range argument is dependent upon whether or not the target processor is an 11/70, memory management was selected, and an RSX-11M system is being generated.

If you do not have memory management and/or specified a size for physical memory less than 124K (a target processor other than an 11/70), the next two questions are asked.

SYSGEN DIALOGUE DETAILS

If you have memory management, the following two questions are omitted; the next question asked concerns floating point support.

; RSX-11M/S IS CAPABLE OF RUNNING ON ALL PDP-11 PROCESSORS. THE
; LSI-11 IS THE SMALLEST MEMBER OF THE PDP-11 FAMILY OF
; PROCESSORS AND IS CONSTRUCTED USING LARGE SCALE INTEGRATED
; CIRCUIT TECHNOLOGY. THE PDP-11/03 IS THE PACKAGED VERSION OF
; THE LSI-11 PROCESSOR.

* IS THE TARGET PROCESSOR AN LSI-11 OR PDP-11/03? [Y/N]:

If this query is answered affirmatively, the next question asked concerns FIS support; EAE and floating point support are not available on an LSI-11 or PDP-11/03.

; THE EXTENDED ARITHMETIC ELEMENT (EAE) (KELL-A/B) IS AN OPTION
; WHICH PERFORMS MULTIPLICATION, DIVISION, MULTIPLE POSITION
; SHIFTS AND NORMALIZATION SIGNIFICANTLY FASTER THAN SOFTWARE
; ROUTINES. IT CONNECTS DIRECTLY TO THE UNIBUS AND IS PROGRAMMED
; AS A PERIPHERAL, ALLOWING OVERLAP BETWEEN CPU AND EAE
; OPERATIONS.

* DO YOU WANT EAE SUPPORT? [Y/N]:

If answered affirmatively, the next query is omitted.

The following question is asked if the system contains memory management support.

It is also asked if EAE support was not selected.

; THE PDP-11 FLOATING POINT PROCESSOR IS AN OPTIONAL ARITHMETIC
; PROCESSOR. IT PERFORMS ALL FLOATING POINT ARITHMETIC
; OPERATIONS AND CONVERTS DATA BETWEEN INTEGER AND FLOATING POINT
; FORMATS. THIS OPTION IS AVAILABLE ON THE PDP 11/34/45/50/55,
; 60 AND 70. THIS SHOULD NOT BE CONFUSED WITH THE FIS
; (FLOATING INSTRUCTION SET) OPTION AVAILABLE WITH THE PDP11/40.

* DO YOU WANT FLOATING POINT PROCESSOR SUPPORT? [Y/N]: Y

If you answer affirmatively the FIS query is omitted.

; THE FIS OPTION (WHICH REQUIRES THE EIS OPTION) INCLUDES
; HARDWARE FLOATING POINT ADD, SUBTRACT, MULTIPLY, AND DIVIDE
; INSTRUCTIONS.

* DO YOU WANT FIS SUPPORT? [Y/N]:

The following query, and the associated number of interrupts, is omitted if the target processor is an LSI-11.

; RSX-11M/S REQUIRES A REAL-TIME CLOCK FOR ITS OPERATION. EITHER
; THE KW11-P PROGRAMMABLE FREQUENCY CLOCK OR KW11-L LINE
; FREQUENCY CLOCK OR THE DL11-W LINE FREQUENCY CLOCK/CONSOLE
; INTERFACE MAY BE USED.

* DO YOU HAVE A PROGRAMMABLE CLOCK? [Y/N]: N

If the answer is affirmative, the next question is asked.

; THE NUMBER OF INTERRUPTS SPECIFIED MUST BE EVENLY DIVISIBLE
; INTO 10000(10).

SYSGEN DIALOGUE DETAILS

* WHAT IS THE NUMBER OF INTERRUPTS PER SECOND? [D R: 1.-1000.]:

Specifying the number of clock interrupts to be greater than 100. per second should be considered carefully, because it adds significant system overhead.

; LINE FREQUENCY IS EITHER 50 OR 60 HERTZ. IN THE U.S.A. LINE
; FREQUENCY IS ALWAYS 60 HERTZ.

* IS YOUR LINE FREQUENCY 50 HERTZ? [Y/N]: *N*

; THE KW11-Y IS A WATCHDOG TIMER THAT IS CONSTANTLY ATTEMPTING TO
; TIME OUT SYSTEM ACTIVITY. THE RSX-11M/S EXECUTIVE REFRESHES
; THE TIMER AT EVERY CLOCK INTERRUPT. IF THE SYSTEM FAULTS OR A
; HARDWARE FAILURE OCCURS AND THE TIMER ELAPSES AN EXTERNAL
; SIGNAL IS GENERATED.

* DO YOU WANT KW11-Y WATCHDOG TIMER SUPPORT? [Y/N]: *N*

If this option is selected, the generated system will only run on configurations that contain a KW11-Y. An attempt to boot such a system on a configuration not having the KW11-Y will result in an immediate system crash.

; PARITY MEMORY PROVIDES CIRCUITRY TO CHECK THE INTEGRITY OF
; STORED DATA. PARITY CHECKING BITS ARE GENERATED WHEN DATA
; WORDS ARE WRITTEN INTO MEMORY AND CHECKED WHEN THE DATA WORDS
; ARE SUBSEQUENTLY READ OUT OF MEMORY.

* DO YOU WANT PARITY MEMORY SUPPORT? [Y/N]: *Y*

If error logging of parity errors was selected earlier, this option has been included already; the question is omitted.

The parity memory option provides the system with detection of errors in the memory system. If this query is answered affirmatively, the next question is asked.

However, if it is known already that the target processor is a PDP-11/70 (by specifying physical memory greater than 124K earlier), then the following query is omitted.

; THE PDP-11/70 PROVIDES ADDITIONAL PARITY CHECKING CIRCUITRY.
; THE BUFFER MEMORY (CACHE) USED TO SPEED UP MAIN MEMORY
; OPERATIONS IS ALSO CAPABLE OF GENERATING AND CHECKING PARITY.

* DOES THE TARGET PROCESSOR HAVE A CACHE MEMORY? [Y/N]: *Y*

; END PROCESSOR OPTIONS

; BEGIN PERIPHERAL OPTIONS

Selection of a peripheral option (nonzero response to the query) will require the user to enter information concerning the device. This information pertains to the device's vector and CSR addresses and, if loadable driver support has been selected, whether or not the driver is to be loadable.

If the reply to the query for the number of the specific peripherals that are in your system is greater than one, the vector address query is repeated. The second and subsequent displays require an interrupt vector.

SYSGEN DIALOGUE DETAILS

The CSR query appears as many times as the number of peripheral's specified. Note that the queries for the interrupt vector and CSR occur one after the other for each peripheral. The repeat sequence repeats both queries.

* EXPANDED COMMENTS DESIRED FOR PERIPHERAL OPTIONS? [Y/N]: **Y**

Once long dialogue is chosen, the explanatory text is displayed prior to each peripheral option query and cannot be suppressed (except on a per query basis with CTRL/O). Selective short dialogue produces explanatory text following the query only when that query has been answered using ALTMODE/ESCAPE.

It is assumed that expanded comments were selected.

If loadable driver support was selected, you have the option of designating drivers as loadable or resident. For each device to be included in the system (except ICS/ICR, UDC, DRS/DSS, and VT11/VS60), a loadable driver question is asked. Answer Y for loadable drivers, and N or a carriage return for resident drivers.

; WRITECHECK INCREASES THE DATA RELIABILITY OF DISKS AT THE
; COST OF A DEGRADATION IN DISK THROUGHPUT. WRITECHECK, IF
; SELECTED, MAY BE ENABLED/DISABLED DYNAMICALLY ON A PER DRIVE
; BASIS VIA THE MCR SET COMMAND.

; WRITECHECK IS CURRENTLY SUPPORTED FOR ALL DISKS EXCEPT THE RL01
; AND RX01.

; DO YOU WANT DISK WRITECHECK SUPPORT? [Y/N]: **N**

Write check is the process where the driver performs a read after each write. If the data cannot be read or does not match the data written, the data is rewritten and another read attempt is performed.

; PROCESS I/O AND LABORATORY PERIPHERALS CONSIST OF THE FOLLOWING:

; - AD01-D MULTICHANNEL ANALOG DATA ACQUISITION OPTION
; - AFC11 DIFFERENTIAL ANALOG INPUT SUBSYSTEM
; - AR11 LABORATORY PERIPHERAL SYSTEM
; - LP11 LABORATORY PERIPHERAL ACCELERATOR SUBSYSTEM
; - LPS11 LABORATORY PERIPHERAL SYSTEM
; - ICS11/ICR11 INDUSTRIAL CONTROL SUBSYSTEMS
; - UDC11 UNIVERSAL DIGITAL CONTROLLER
; - DRS/DSS DIGITAL I/O MODULES

* DO YOU HAVE ANY PROCESS I/O OR LABORATORY PERIPHERALS? [Y/N]: **Y**

Note that because K-series peripheral support does not require a device driver, they are not included in the above list.

If you answer Y to this question, the following queries concerning the above process I/O peripherals are asked. If you do not have any process I/O peripherals, skip this section and continue reading from the CM/CR11 card reader section (under the heading ALL SYSTEMS).

If loadable driver support was selected, you have the option of designating drivers as loadable or resident. For each device to be included in the system (except ICS/ICR, UDC,

SYSGEN DIALOGUE DETAILS

DRS/DSS, and VT11/VS60), a loadable driver question is asked. Answer Y for loadable drivers, and N or a carriage return for resident drivers.

Selection of a peripheral option (nonzero response to the query) will require the user to enter information concerning the device. This information pertains to the device's vector and CSR addresses and, if loadable driver support has been selected, whether or not the driver is to be loadable.

If the reply to the query for the number of the specific peripherals that are in your system is greater than one, the vector address query is repeated. The second and subsequent displays require an interrupt vector.

The CSR query appears as many times as the number of peripherals specified. Note that the queries for the interrupt vector and CSR occur one after the other for each peripheral. The repeat sequence repeats both queries.

PROCESS I/O AND LAB PERIPHERALS

; THE AD01-D IS A MULTICHANNEL ANALOG DATA ACQUISITION OPTION
; WHICH INTERFACES DIRECTLY TO PDP-11 COMPUTERS.

; THE STANDARD AD01-D CONSISTS OF AN EXPANDABLE SOLID-STATE INPUT
; MULTIPLEXER, PROGRAMMABLE INPUT RANGE SELECTOR, A/D CONVERTER,
; CONTROL, AND BUS INTERFACE. THE MULTIPLEXER CAN BE EXPANDED BY
; ADDING 4-CHANNEL MODULES UP TO 32 CHANNELS. AN EXPANSION
; MULTIPLEXER MAY BE ADDED TO PROVIDE A MAXIMUM CONFIGURATION OF
; 64 CHANNELS.

* HOW MANY AD01-D A/D CONVERTERS DO YOU HAVE? [D R: 0.-16.]: ϕ

* ENTER CSR ADDR. OF THE NEXT AD01 [O R: 160000-177700 DL176770]:

* HOW MANY A/D CHANNELS DOES IT HAVE? [D R:1.-64.]:

This query appears as many times as the number of AD01-Ds specified. Note that the queries for the CSR, and the number of channels occur one after the other for each AD01-D. The repeat sequence repeats both of the queries.

; THE AFC11 IS A DIFFERENTIAL ANALOG INPUT SUBSYSTEM FOR
; IDACS-11 INDUSTRIAL CONTROL SYSTEMS. THE AFC11 SYSTEM
; MULTIPLEXES UP TO 1024 DIFFERENTIAL INPUT ANALOG SIGNALS,
; SELECTS GAIN, AND PERFORMS A 13-BIT ANALOG-TO-DIGITAL
; CONVERSION AT A 200 CHANNEL PER SECOND RATE UNDER PROGRAM
; CONTROL.

* HOW MANY AFC11 A/D CONVERTERS DO YOU HAVE? [D R: 0.-16.]: ϕ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT AFC11? [O R: 60-774 D:134]:

* WHAT IS ITS CSR ADDRESS? [O R: 160000-177700 D:172570]:

* HOW MANY A/D CHANNELS DOES IT HAVE? [D R:1.-1024.]:

; THE AR11 LAB PERIPHERAL SYSTEM IS A LOW-COST REALTIME SUBSYSTEM
; WHICH INTERFACES TO THE PDP-11 FAMILY OF COMPUTERS. THE SYSTEM
; INCLUDES A 10-BIT A/D CONVERTOR, PROGRAMMABLE REALTIME CLOCK,
; AND DISPLAY CONTROL.

SYSGEN DIALOGUE DETAILS

* HOW MANY AR11 LAB PERIPHERAL SYSTEMS DO YOU HAVE? [D R: 1-1024.]: ϕ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

; THE CLOCK VECTOR ADDRESS FOR THE AR11 IS ASSIGNED FROM THE
; FLOATING VECTOR SPACE STARTING AT 300. IT IS LOCATED AT AN
; OFFSET OF FOUR (4) FROM THE BEGINNING OF THE AR11 VECTOR SPACE.
; CONSULT FIELD SERVICE TO DETERMINE LOCATION IF UNKNOWN.

* ENTER CLOCK VECTOR ADDRESS OF THE NEXT AR11 [O R:300-774]:

For the AR11 driver to operate properly, the interrupt vector of its real-time clock must be specified. If the number of AR11s specified was greater than 1, this query is repeated by SGN for each AR11.

; 170400 IS THE STANDARD CSR ADDRESS FOR THE AR11. THE ADDRESS
; REQUIRED HERE IS THAT OF THE FIRST WORD OF THE AR11 CSR GROUP.

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:170400]:

; THE POLARITY MASK WORD CORRESPONDS ONE-TO-ONE WITH THE 16
; POSSIBLE CHANNELS. A 1-BIT DESIGNATES A UNI-POLAR CHANNEL.
; A 0-BIT DESIGNATES A BI-POLAR CHANNEL.

* WHAT IS THE POLARITY MASK WORD? [O]:

* IS THE D/A OPTION PRESENT? [Y/N]:

Although the AR11 module includes a D/A converter, support for the D/A is optional in the driver. If D/A support is not chosen, the driver will be significantly shorter.

; THE QUERY RESPONSE VALUE MUST BE EVENLY DIVISIBLE INTO 10000.

* ENTER MAXIMUM NUMBER OF SAMPLES PER SECOND [D R:1.-2500.]:

; THE AR11 DOES NOT INCLUDE THE 16-BIT DIGITAL I/O OPTION THAT IS
; AVAILABLE WITH THE LPS11. THE SAME FUNCTIONALITY, HOWEVER, MAY
; BE ACHIEVED BY USING A DR11-K THAT IS JUMPER SELECTED TO USE
; THE 16 INDIVIDUAL INPUT LINES WITHOUT INTERRUPTS.

* IS THE DR11-K OPTION PRESENT? [Y/N]:

This query appears as many times as the number of AR11s specified. Note that the queries for interrupt vector, CSR, polarity mask word, D/A option, maximum sample rate, and DR11-K option occur one after the other for each AR11. The repeat sequence repeats all six queries. If this question is answered affirmatively, then the next question is also asked.

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:170420]:

; THE LP11 LAB PERIPHERAL ACCELERATOR IS A REAL-TIME SUBSYSTEM WHICH
; INTERFACES TO THE PDP-11 FAMILY OF COMPUTERS. THE SYSTEM CONSISTS
; OF THE LPA-11, UP TO 2 A/D CONVERTERS, A PROGRAMMABLE REAL-TIME
; CLOCK, A D/A CONVERTER, AND UP TO FIVE DIGITAL I/O MODULES.

* HOW MANY LP11-K LAB SUBSYSTEMS DO YOU HAVE: [D R:0.-16.]:

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

; LP11'S ARE ASSIGNED VECTORS FROM THE FLOATING VECTOR SPACE. CONSULT

SYSGEN DIALOGUE DETAILS

- ; FIELD SERVICE TO DETERMINE THE LOCATION IF UNKNOWN.
- * ENTER VECTOR ADDRESS OF THE NEXT LP11 [O R:300-774]:
- ; 170460 IS THE STANDARD CSR ADDRESS FOR THE FIRST LP11. NOTE THAT
; THE ADDRESS REQUIRED IS THAT OF THE FIRST WORD OF THE LP11 CSR
; GROUP. CONSULT FIELD SERVICE TO DETERMINE ITS LOCATION IF UNKNOWN.
- * WHAT IS ITS CSR ADDRESS? [O R:160200-177700 D:170460]:
- ; THE LPS11 LAB PERIPHERAL SYSTEM IS A REAL-TIME SUBSYSTEM WHICH
; INTERFACES TO THE PDP-11 FAMILY OF COMPUTERS. THE SYSTEM
; HOUSES A 12-BIT A/D CONVERTOR, PROGRAMMABLE REAL-TIME CLOCK,
; DISPLAY CONTROLLER AND A 16-BIT DIGITAL I/O OPTION.
- * HOW MANY LPS11 LAB. PERIPHERAL SYSTEMS DO YOU HAVE? [D R:0.-16.]:
* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:
- ; THE CLOCK VECTOR ADDRESS FOR THE LPS11 IS ASSIGNED FROM THE
; FLOATING VECTOR SPACE STARTING AT 300. IT IS LOCATED AT AN
; OFFSET OF FOUR (4) FROM THE BEGINNING OF THE LPS11 VECTOR
; SPACE. CONSULT FIELD SERVICE TO DETERMINE THE LOCATION IF
; UNKNOWN.
- * ENTER CLOCK VECTOR ADDRESS OF THE NEXT LPS11 [O R:300-774]:
- ; 170400 IS THE STANDARD CSR ADDRESS FOR THE LPS11. NOTE THAT THE
; ADDRESS REQUIRED IS THAT OF THE FIRST WORD OF THE LPS11 CSR
; GROUP.
- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:170400]:
* HOW MANY A/D CHANNELS DOES IT HAVE? [D R:1.-64.]:
* IS THE GAIN RANGING OPTION PRESENT? [Y/N]:

If the gain ranging option is present, you are asked to identify the polarity mask word and whether or not bandwidth filtering is enabled. Otherwise, the next three queries are skipped.

- ; THE POLARITY MASK WORD CORRESPONDS ONE-TO-ONE WITH THE 16
; POSSIBLE CHANNELS. A 1-BIT DESIGNATES A UNI-POLAR CHANNEL. A
; 0-BIT DESIGNATES A BI-POLAR CHANNEL.

- * WHAT IS THE POLARITY MASK WORD? [O]:
* DO YOU HAVE BANDWIDTH FILTERING ENABLED? [Y/N]:

If bandwidth filtering is enabled, the following query concerning the channel select delay is asked; otherwise it is omitted.

- ; WITH BANDWIDTH FILTERING ENABLED, THE LPS11 DRIVER MUST IMPOSE
; A SOFTWARE DELAY BETWEEN THE TIME IT CHANGES CHANNELS ON THE
; MULTIPLEXER AND THE TIME IT INITIATES THE A/D CONVERSION. THIS
; DELAY PERIOD CAN RANGE FROM 85 USEC TO 8.5 MSEC. CONSULT THE
; LPS11 LABORATORY PERIPHERAL SYSTEM USER'S GUIDE FOR THE PROPER
; DELAY FOR YOUR APPLICATION.

- ; NOTE THAT THE RESPONSE MUST BE IN 100 USEC UNITS, I.E. SPECIFY
; 25 TO DELAY 2.5 MSEC.

- * ENTER CHANNEL SELECT DELAY (IN 100 USEC UNITS) [D R:1.-85.]:

Whether or not gain ranging is present, you are asked if the D/A option is present.

SYSGEN DIALOGUE DETAILS

* IS THE D/A OPTION PRESENT? [Y/N]:

If it is present, you must enter the number of D/A channels.

* HOW MANY D/A CHANNELS DOES IT HAVE? [D R:1.-10.]:

The first two D/A channels correspond to the X and Y registers of the display controller. Up to eight additional D/A channels may be specified if the external D/A option is present.

; THE LPSDR-A DIGITAL I/O AND RELAY MODULE IS SUPPORTED AS AN
; OPTION BY THE LPS11 DRIVER.

* IS THE DIGITAL I/O AND RELAY OPTION PRESENT? [Y/N]:

; THE QUERY RESPONSE VALUE MUST BE EVENLY DIVISIBLE INTO 10000.

* ENTER MAXIMUM NUMBER OF SAMPLES PER SECOND [D R:1.-2500.]:

Selection of ICS/ICR-11 support precludes UDC-11 support;
ICS/ICR-11 and UDC-11 are mutually exclusive.

; THE ICS-11 AND ICR-11 ARE PROCESS I/O SUBSYSTEMS WHICH PROVIDE
; ANALOG AND DIGITAL INTERFACE CAPABILITIES BETWEEN THE PDP-11
; COMPUTER SYSTEMS AND TYPICAL INDUSTRIAL INSTRUMENTATION AND
; TRANSDUCERS. THE ICS-11 IS A LOCAL SUBSYSTEM FOR DIRECT
; CONNECTION TO THE PDP-11 UNIBUS. THE ICR-11 IS CONNECTED TO
; THE PDP-11 BY A HIGH-SPEED SERIAL LINE WHICH CAN BE UP TO
; 6000 FEET (1830 METERS) LONG.

; EACH ICS/ICR-11 CAN ACCOMMODATE UP TO 16 FUNCTIONAL I/O MODULES.
; RSX-11M/S SUPPORTS ANY MIXTURE OF ICS-11 AND ICR-11 SUBSYSTEMS
; TO A MAXIMUM OF 12.

* HOW MANY ICS/ICR-11 SUBSYSTEMS DO YOU HAVE? [D R:0.-12.]: ;

; THE RSX-11M/S ICS/ICR-11 DRIVER PROVIDES THE CAPABILITY TO
; INITIATE A TASK AS THE RESULT OF AN UNSOLICITED (EXTERNAL)
; INTERRUPT. IF THIS OPTION IS SELECTED, SUPPORT IS PROVIDED TO
; ALLOW TASKS TO BE LINKED TO INTERRUPTS AND TO OBTAIN ACTIVATION
; DATA WHEN INITIATED.

* DO YOU WANT TASK ACTIVATION FROM UNSOLICITED INTERRUPTS? [Y/N]: Y

; 234 IS THE STANDARD VECTOR ADDRESS FOR THE FIRST ICS/ICR-11.
; ADDITIONAL VECTORS ARE ASSIGNED FROM THE FLOATING VECTOR SPACE
; STARTING AT 300. CONSULT FIELD SERVICE TO DETERMINE LOCATIONS
; IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT ICS/ICR-11 [O R:234-774 D:234]: D

; 171776 IS THE STANDARD CSR ADDRESS FOR THE FIRST ICS/ICR-11.
; ADDITIONAL ICS/ICR-11 CSR ADDRESSES ARE ASSIGNED STARTING AT
; 171766 AND PROCEED DOWNWARD AT EIGHT BYTE INTERVALS (E.G.
; 171766, 171756, 171746, ETC.).

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:171776]: D

Note that the default CSR address is decremented as
described above.

* IS IT AN ICR-11? [Y/N]: Y

Verify
module
numbers

SYSGEN DIALOGUE DETAILS

This query is repeated for each ICS/ICR-11 selected.

; THE IAD-IA IS A MERCURY WETTED FLYING CAPACITOR ANALOG TO
; DIGITAL CONVERTER WITH 8 CHANNELS OF WIDE RANGE DIFFERENTIAL
; INPUT.

* HOW MANY A/D CONVERTER MODULES IN THIS ICS/ICR? [D R:0.-16.]: |

This query appears as many times as the number of
ICS/ICR-11s specified. If answered with a non-zero value,
the next two questions are asked.

* WHAT IS THE MODULE NUMBER OF THE NEXT A/D CONVERTER? [D R:0.-15.]: ϕ

; THE IMX-IA IS A 16 CHANNEL EXPANDER MULTIPLEXER FOR THE IAD-IA
; A/D CONVERTER. UP TO 7 IMX-IA MODULES MAY BE ADDED TO EACH
; IAD-IA A/D CONVERTER. ALL IMX-IA MODULES MUST BE PHYSICALLY
; ADJACENT TO THEIR ASSOCIATED IAD-IA CONVERTER.

* HOW MANY EXPANSION MULTIPLEXERS DOES IT HAVE? [D R:0.-7.]: ϕ

This query is repeated as many times as the number of A/D
converters specified. Note that the queries for module
number and number of multiplexers occur one after the other
for each A/D converter. The repeat sequence repeats both
queries.

; THE IDA-OA IS A 4 CHANNEL DIGITAL TO ANALOG CONVERTER CAPABLE
; OF DRIVING 0 TO 10 VOLTS OR 0 TO 50 MILLIAMPS.

* HOW MANY D/A CONVERTER MODULES IN THIS ICS/ICR? [D R:0.-16.]: |

This query appears as many times as the number of
ICS/ICR-11s specified. If this query is answered with a
nonzero value, then the next question is asked.

Note that in the next six queries, the number of module
types is 16 minus the number of modules previously
specified.

* ENTER THE MODULE NUMBER OF THE NEXT D/A CONVERTER [D R:0.-15.]: ϕ

This query is repeated as many times as the number of D/A
converters specified.

; THE SINGLE-SHOT OUTPUTS AVAILABLE FOR THE ICS/ICR-11 INCLUDE
; THE IDC-OB DC VOLTAGE OUTPUT AND THE IAC-OB AC VOLTAGE OUTPUT
; MODULES.

* HOW MANY SINGLE-SHOT OUTPUT MODULES IN THIS ICS/ICR? [D R:0.-x.]: ϕ

This query appears as many times as the number of
ICS/ICR-11s specified. If this query is answered with a
nonzero value, then the next question is asked.

* ENTER MODULE NUMBER OF THE NEXT SINGLE-SHOT OUTPUT [D R:0.-15.]:

This query is repeated as many times as the number of
single-shot output modules specified.

; THE BI-STABLE DIGITAL OUTPUT MODULES FOR THE ICS/ICR-11 INCLUDE
; THE IRL-OA AND IRL-OB RELAY OUTPUTS, AND THE IAC-OA AC VOLTAGE
; OUTPUTS.

SYSGEN DIALOGUE DETAILS

- ;
* HOW MANY BI-STABLE OUTPUT MODULES IN THIS ICS/ICR? [D R:0.-x.): |
- This query appears as many times as the number of ICS/ICR-lls specified. If this query is answered with a nonzero value, then the next question is asked.
- * ENTER MODULE NUMBER OF THE NEXT BI-STABLE OUTPUT [D R:0.-15.): ϕ
- This query is repeated for each bi-stable output module specified.
- ; THE DIGITAL SENSE MODULES FOR THE ICS/ICR-11 INCLUDE THE IDC-IA
; ISOLATED DC INPUT, THE IDC-ID NON-ISOLATED INPUT, AND THE
; IAC-IA AC INPUT.
- * HOW MANY DIGITAL SENSE MODULES IN THIS ICS/ICR? [D R:0.-x.): |
- This query appears as many times as the number of ICS/ICR-lls specified. If this query is answered with a nonzero value, then the next question is asked.
- * ENTER MODULE NUMBER OF THE NEXT DIGITAL SENSE [D R:0.-15.): ϕ
- This query is repeated for each digital sense module specified.
- ; THE DIGITAL INTERRUPT MODULES FOR THE ICS/ICR-11 INCLUDE THE
; IDC-IB ISOLATED DC INTERRUPT, THE IDC-IE NON-ISOLATED DC
; INTERRUPT, AND THE IAC-IB AC INTERRUPT.
- * HOW MANY DIGITAL INTERRUPT MODULES IN THIS ICS/ICR? [D R:0.-x.): |
- This query appears as many times as the number of ICS/ICR-lls specified. If this query is answered with a nonzero value, then the next question is asked.
- * ENTER MODULE NUMBER OF THE NEXT DIGITAL INTERRUPT [D R:0.-15.): ϕ
- This query is repeated for each digital interrupt module specified.
- ; THE IDC-IC IS A 16 BIT BINARY UP-COUNTER WITH PRESCALAR INPUT
; AND BOTH EXTERNAL TRIGGER AND OVERFLOW OUTPUTS.
- * HOW MANY I/O COUNTER MODULES IN THIS ICS/ICR? [D R:0.-x.): |
- This query appears as many times as the number of ICS/ICR-lls specified. Note that the queries for interrupt vector, CSR, and ICS/ICR-11 and the key queries for A/D converters, D/A converters, single-shot outputs, bistable outputs, digital sense, digital interrupt, and I/O counters occur one after the other for each ICS/ICR-11. The repeat sequence repeats all ten queries. If the answer to this query is nonzero, then the next question is asked.
- * ENTER MODULE NUMBER OR THE NEXT I/O COUNTER [D R:0.-15.): ϕ
- This query is repeated for each I/O counter module specified.
- ; THE RSX-11M/S ICS/ICR-11 DRIVER WILL OPTIONALLY RESTORE THE
; STATE OF ALL BI-STABLE DIGITAL OUTPUTS, ANALOG OUTPUTS, AND I/O
; PRESCALAR VALUES ON POWER RECOVERY AND RECOVERY FROM SUSTAINED

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; ICR-11 SERIAL TRANSMISSION ERRORS.

* RESTORE MODULE STATUS ON POWER AND ERROR RECOVERY? [Y/N]: Y

The above query is asked only if the target system contains a bistable output, D/A converter, or I/O counter modules.

; THE RSX-11M/S ICS/ICR-11 DRIVER WILL PLACE AN ICR-11 SUBSYSTEM
; OFFLINE IF THE SERIAL LINE ERRORS EXCEED A PREDEFINED LIMIT
; DURING ONE SECOND OF ELAPSED TIME. THE SUBSYSTEM WILL
; AUTOMATICALLY BE PLACED ONLINE WHEN SERIAL LINE ERRORS HAVE
; STOPPED.

* HOW MANY LINE ERRORS ARE ACCEPTABLE PER SEC.? [D R:0.-5000.]: 100

The above query is asked only if the target system contains an ICR-11 subsystem.

; THE DRS-11 IS A DIGITAL I/O MODULE DESIGNED TO MEET THE NEEDS
; OF SMALL INDUSTRIAL DATA ACQUISITION AND CONTROL SYSTEMS.
; EACH DRS-11 MODULE PROVIDES 48 BUFFERED DIGITAL OUTPUTS AND
; ONE RC FILTERED INTERRUPT INPUT.

* HOW MANY DRS-11 DIGITAL OUTPUT MODULES DO YOU HAVE? [D R:0.-16.]: 4

* DO YOU WANT MODULE STATUS RESTORED ON POWER RECOVERY? [Y/N]:

* ENTER CSR ADDRESS OF THE FIRST DRS-11 [O R:160000-177700]:

* WHAT IS THE VECTOR ADDRESS OF THE NEXT DRS-11? [O R:300-774]:

Note that since the DRS/DSS-11 driver cannot be loadable, the loadable driver query was omitted.

The power recovery and CSR address questions are asked only once. The vector address question is asked for each DRS-11 specified.

; THE DSS-11 IS A DIGITAL I/O MODULE DESIGNED TO MEET THE NEEDS
; OF SMALL INDUSTRIAL DATA ACQUISITION AND CONTROL SYSTEMS.
; EACH DSS-11 MODULE PROVIDES 49 OPTICALLY ISOLATED INPUTS
; CONSISTING OF 48 NON-BUFFERED SENSE DATA INPUTS AND 1 INTERRUPT
; INPUT.

* HOW MANY DSS-11 DIGITAL INPUT MODULES DO YOU HAVE? [D R:0.-x.]: 0

Note that x above is replaced by 16 minus the number of DRS-11s specified.

The combined number of DRS-11 and DSS-11 modules cannot exceed 16. Therefore, if 16 DRS-11 modules were specified, the above DSS-11 query and the next two pertaining to the CSR and vector addresses of the DSS-11 module are omitted.

* ENTER CSR ADDRESS OF THE FIRST DSS-11 [O R:160000-177700]:

* WHAT IS THE VECTOR ADDRESS OF THE NEXT DSS-11? [O R:300-774]:

; THE RSX-11M/S DRS/DSS-11 DRIVER PROVIDES THE CAPABILITY TO
; INITIATE A TASK AS THE RESULT OF AN UNSOLICITED (EXTERNAL)
; INTERRUPT. IF THIS OPTION IS SELECTED, SUPPORT IS PROVIDED TO
; ALLOW TASKS TO BE LINKED TO INTERRUPTS AND TO OBTAIN ACTIVATION
; DATA WHEN INITIATED.

* DO YOU WANT TASK ACTIVATION FROM UNSOLICITED INTERRUPTS? [Y/N]:

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This question is asked if at least one DRS/DSS-11 module was specified.

The following queries concerning the UDC11 digital controllers are asked only if ICS/ICR support was omitted.

; THE UDC11 IS AN INPUT/OUTPUT OPTION FOR INDUSTRIAL AND PROCESS
; CONTROL APPLICATIONS THAT USE THE PDP-11 COMPUTER. THE UDC11
; INTERROGATES OR DRIVES UP TO 252 DIRECTLY ADDRESSABLE DIGITAL
; SENSE AND CONTROL FUNCTIONAL I/O MODULES OR UP TO 4032
; INDIVIDUAL DIGITAL POINTS.

; RSX-11M/S SUPPORTS ONLY ONE UDC CONTROLLER. THE ONLY VALID
; ANSWERS TO THIS QUERY ARE 0 AND 1.

* HOW MANY UDC11 CONTROLLERS DO YOU HAVE? [D R:0.-1.]: ϕ

; 234 IS THE STANDARD VECTOR ADDRESS FOR THE UDC11.

* WHAT IS THE VECTOR ADDRESS OF THE UDC11? [O R:60-774 D:234]:

; 171776 IS THE STANDARD CSR ADDRESS FOR THE UDC11.

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:171776]:

The UDC11 can support up to 252 modules, which can be classified into seven types:

1. Analog input
2. Analog output
3. Digital interrupt
4. Digital sense
5. Bistable output
6. Single-shot output
7. I/O counters

RSX-11M/RSX-11S requires that modules of the same type occupy consecutive locations within the UDC11. Thus, if there are seven analog input modules and the first module starts at slot 0, then the last must be at slot 6. Obviously, module types cannot overlap, though unassigned slots are permitted.

The queries which follow establish the module boundaries.

* HOW MANY ADU01 ANALOG INPUT MODULES DO YOU HAVE? [D R:0.-252.]:
* ENTER MOD. NUMBER OF THE FIRST ADU01 ANALOG INPUT [D R:0.-252.]:

The next query appears only if the number of ADU01 analog input modules was zero.

* HOW MANY IAD-IA ANALOG INPUT MODULES DO YOU HAVE? [D R:0.-252.]:
* ENTER MOD. NUMBER OF THE FIRST IAD-IA ANALOG INPUT [D R:0.-252.]:

Note that in the following queries, x is replaced by 252 minus the number of other modules specified.

* HOW MANY ANALOG OUTPUT MODULES DO YOU HAVE? [D R:0.-x.]:
* ENTER MOD. NUMBER OF THE FIRST ANALOG OUTPUT [D R:0.-252.]:
* HOW MANY DIGITAL INTERRUPT MODULES DO YOU HAVE? [D R:0.-x.]:
* ENTER MOD. NUMBER OF THE FIRST DIGITAL INTERRUPT [D R:0.-252.]:
* HOW MANY DIGITAL SENSE MODULES DO YOU HAVE? [D R:0.-x.]:
* ENTER MOD. NUMBER OF THE FIRST DIGITAL SENSE [D R:0.-252.]:
* HOW MANY BI-STABLE OUTPUT MODULES DO YOU HAVE? [D R:0.-x.]:

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- * ENTER MOD. NUMBER OF THE FIRST BI-STABLE OUTPUT [D R:0.-252.]:
- * HOW MANY SINGLE-SHOT OUTPUT MODULES DO YOU HAVE? [D R:0.-x.]:
- * ENTER MOD. NUMBER OF THE FIRST SINGLE-SHOT OUTPUT [D R:0.-252.]:
- * HOW MANY I/O COUNTER MODULES DO YOU HAVE? [D R:0.-x.]:
- * ENTER MOD. NUMBER OF THE FIRST I/O COUNTER [D R:0.-252.]:

This is the end of process I/O peripheral queries.

ALL SYSTEMS

; THE CR11 CARD READER READS EIA STANDARD 80-COLUMN PUNCHED DATA
; CARDS AT 300 CARDS PER MINUTE; THE CM11-F READS 80-COLUMN
; MARK-SENSE CARDS, WHICH CAN HAVE PUNCHED HOLES, AT 285 CARDS
; PER MINUTE.

- * HOW MANY CM/CR11 CARD READERS DO YOU HAVE? [D R:0.-16.]: 1

- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: Y

- * enter VECTOR ADDRESS OF THE NEXT CM/CR11? [o r:60-774 d:230]: D

- * WHAT IS ITS CSR ADDRESS? [o r:160000-177700 d:1777160]: D

; YOU MAY OPTIONALLY SPECIFY THE TIME BETWEEN READER NOT READY
; MESSAGES. A RESPONSE OF ZERO SUPPRESSES THE MESSAGES ENTIRELY.

- * ENTER INTERVAL FOR READER NOT READY MESSAGES [D R:0.-255. D:15.]: *Default*

Reader not ready messages are displayed in intervals of
1-255 seconds each on the console terminal.

; THE TALL MAGNETIC TAPE CASSETTE SYSTEM IS DUAL-DRIVE,
; REEL-TO-REEL UNIT DESIGNED TO REPLACE PAPER TAPE. ITS TWO
; DRIVES RUN NON-SIMULTANEOUSLY USING PROPRIETARY DIGITAL
; EQUIPMENT CORPORATION PHILIPS-TYPE CASSETTES. THE TALL
; INCLUDES A CONTROL UNIT AND A DUAL TAPE TRANSPORT.

- * HOW MANY TALL DUAL CASSETTES DO YOU HAVE? [D R:0.-16.]: ϕ

- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

- * WHAT IS THE VECTOR ADDRESS OF THE NEXT TALL [O R:60-774 D:260]:

- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177500]:

; THE RJ/RWP04-05-06 ARE 19 DATA SURFACE, REMOVABLE, RANDOM ACCESS
; BULK STORAGE SYSTEMS WITH A STORAGE CAPACITY OF 43,980,288 WORDS
; (RP04-05) AND 87,211,520 WORDS (RP06) PER PACK. EACH INCLUDES
; A CONTROL UNIT AND THE FIRST DISK PACK DRIVE AND IS EXPANDABLE
; UP TO EIGHT DRIVES.

- * HOW MANY RJ/RWP04-05-06 DISK CONTROLLERS HAVE YOU? [D R:0.-16.]: 1

; OFFSET RECOVERY IS A TECHNIQUE FOR READING DATA IN INSTANCES
; WHERE IT CANNOT OTHERWISE BE RECOVERED. IT INVOLVES MOVING THE
; DISK READ HEAD IN SMALL INCREMENTS ABOUT CYLINDER CENTERLINE IN
; AN ATTEMPT TO PICK UP A STRONGER SIGNAL AND THUS ALLOW DATA TO
; BE RECOVERED.

- * DO YOU WANT OFFSET RECOVERY SUPPORT?[Y/N]: Y

Offset recovery is especially important in environments
where disk packs are frequently moved from drive to drive.
It is also recommended when a high degree of data
reliability is required.

SYSGEN DIALOGUE DETAILS

- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: *N*
- * ENTER VECTOR ADDRESS OF THE NEXT RJ/RWP04-05-06? [O R:60-774 D:254]: *0*
- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:176700]: *D*
- * HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]: *1*

This query appears as many times as the number of controllers specified.

; THE TYPICAL RESPONSE TO THE NEXT QUESTION IS ZERO. A NONZERO
; RESPONSE SHOULD BE ARRIVED AT AFTER CONSULTATION WITH A DEC
; FIELD SERVICE REPRESENTATIVE.

- * ENTER PHYSICAL UNIT NUMBER OF THE FIRST DRIVE [O D:0]: *D*

This query appears as many times as the number of controllers specified. Note that the queries for the interrupt vector, CSR, the number of drives, and physical unit number occur one after the other for each controller. The repeat sequence repeats all four of the queries.

- * IS THE FIRST DRIVE AN RP04 OR RP05? [Y/N]: *N*
- * IS THE NEXT DRIVE AN RP04 OR RP05? [Y/N]: *N*

RP05s and RP06s can be mixed on the same controller; specify N to indicate an RP06 unit. The second query is repeated as many times as the number of drives previously specified.

; THE RF11-A IS A FAST, LOW-COST, RANDOM-ACCESS BULK-STORAGE
; SYSTEM. AN RF11-A PROVIDES 262,144 17-BIT WORDS (16 DATA BITS
; AND 1 PARITY BIT) OF STORAGE. UP TO EIGHT RS11 DISKS CAN BE
; CONTROLLED BY ONE RF11 CONTROL FOR A TOTAL OF 2,047,102 WORDS
; OF STORAGE. AN RF11-A INCLUDES A CONTROL UNIT AND THE FIRST
; DISK DRIVE.

- * HOW MANY RF11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: *0*
- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:
- * ENTER VECTOR ADDRESS OF THE NEXT RF11? [O R:60-774 D:204]:
- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D 1777460]:

; THE RK11-D CARTRIDGE DISK DRIVE AND CONTROL IS A COMPLETE MASS
; STORAGE SYSTEM FOR LARGE VOLUME, RANDOM ACCESS DATA STORAGE.
; THE SYSTEM INCLUDES A MODULAR MASS STORAGE DEVICE UTILIZING
; REMOVABLE DISK CARTRIDGES AND A COMPLETE, EASY-TO-PROGRAM,
; CONTROL UNIT. A DISK CARTRIDGE HOLDS OVER 1.2 MILLION WORDS.
; THE SYSTEM IS EXPANDABLE UP TO 9.6 MILLION WORDS PER CONTROL (8
; DISKS). AN RK11-D INCLUDES A CONTROL UNIT AND THE FIRST DISK
; DRIVE. OPTIONALLY, THE CONTROLLER CAN SUPPORT UP TO FOUR RK05F
; FIXED PLATTER DRIVES HAVING TWICE THE CAPACITY OF THE STANDARD
; RK05 DRIVES.

- * HOW MANY RK11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]:
- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

SYSGEN DIALOGUE DETAILS

- * ENTER VECTOR ADDRESS OF THE NEXT RK11 [O R:60-774 D:220]:
- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177404]:
- * ENTER NUMBER OF RK05F FIXED PLATTERS [O R:0-4]: ϕ

This query appears as many times as the number of RK11-Ds specified. Note that the queries for the interrupt vector, CSR, and the number of drives occur one after the other for each RK11-D controller. The repeat sequence repeats all three of the queries. If fewer than 4 RK05Fs are specified, the next two questions are asked; otherwise they are omitted.

- * ENTER NUMBER OF RK05 REMOVABLE PLATTERS [D R:1.-x.]:

Note that x above is replaced by eight minus two times the number of RK05Fs.

The RK11-D controller can service up to 8 units where each RK05F is handled as 2 standard RK05 units. If the total number of units calculated is odd and there is at least one RK05F drive present, the next question is asked; otherwise it is omitted.

- * IS THE LAST DRIVE AN RK05F? [Y/N]:

Since each RK05F requires two unit slots and must begin on an even numbered unit, it may be necessary for the query section to add one dummy unit to the system. An example would be the case in which unit 0 is an RK05, unit 1 is an empty slot, and units 2 and 3 are an RK05F. In this instance, an affirmative answer (Y) should be supplied, so that the query section could supply the required fourth unit control block.

; THE RL11/RL01 DISK SUBSYSTEM USES A MEDIUM PERFORMANCE, DIRECT
; ACCESS DRIVE WITH A SINGLE READ/WRITE HEAD PER SURFACE. EACH
; DRIVE PROVIDES 2,621,440 16-BIT WORDS OF STORAGE ON A REMOVABLE,
; TOP LOADING CARTRIDGE. THE SUBSYSTEM IS EXPANDABLE UP TO FOUR
; DRIVES.

- * HOW MANY RL11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: ϕ
- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:
- * ENTER VECTOR ADDRESS OF THE NEXT RL11 [O R:60-774 D:330]:
- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:174400]:
- * HOW MANY DRIVES DOES IT HAVE? [D R:1.-4.]:

; THE RK611/RK06-07 IS A 3 DATA SURFACE, REMOVABLE, RANDOM ACCESS
; BULK STORAGE SYSTEM WITH A STORAGE CAPACITY OF 6,944,256 (RK06)
; OR 13,770,240 (RK07) 16-BIT WORDS PER PACK. THE RK611/RK06-07
; INCLUDES A CONTROL UNIT AND THE FIRST DISK PACK DRIVE. THE
; SYSTEM IS EXPANDABLE UP TO EIGHT DRIVES.

- * HOW MANY RK611 DISK CONTROLLERS DO YOU HAVE? [D R:0-16.]: ϕ
- ; OFFSET RECOVERY IS A TECHNIQUE FOR READING DATA IN INSTANCES
; WHERE IT CANNOT OTHERWISE BE RECOVERED. IT INVOLVES MOVING THE
; DISK READ HEAD IN SMALL INCREMENTS ABOUT CYLINDER CENTERLINE IN
; AN ATTEMPT TO PICK UP A STRONGER SIGNAL AND THUS ALLOW DATA TO
; BE RECOVERED.

SYSGEN DIALOGUE DETAILS

* DO YOU WANT OFFSET RECOVERY SUPPORT? [Y/N]:

Offset recovery is especially important in environments where disk packs are frequently moved from drive to drive. It is also recommended where a higher degree of data reliability is required.

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT RK611 [O R:60-774 D:210]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177440]:

* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]:

This query appears as many times as the number of RK611 controllers specified. Note that the queries for the interrupt vector, command register, and the number of drives occur one after the other for each RK611 controller. The repeat sequence repeats all three of the queries.

* IS THE FIRST DRIVE AN RK06? [Y/N]:

* IS THE NEXT DRIVE AN RK06? [Y/N]:

; THE RP11-C/E IS A COMPLETE MASS STORAGE SYSTEM USING A MAGNETIC
; DISK PACK WITH 20 DATA SURFACES AND A MOVING READ/WRITE HEAD.
; THE RP11-C/E INCLUDES A CONTROL UNIT AND THE FIRST DISK PACK
; DRIVE. THE SYSTEM IS EXPANDABLE UP TO 8 DRIVES, EACH HAVING A
; CAPACITY OF 20,480,000 (RP03) OR 10,240,000 (RPR02) 16-BIT
; WORDS. ACCESS TIMES ARE 29 MSEC. AVERAGE LATERAL (CYLINDER TO
; CYLINDER) AND 12.5 MSEC. HALF ROTATIONAL.

* HOW MANY RP11-C/E DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: ϕ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT RP11C/E? [O R:60-774 D:254]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:176714]:

* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]:

This query appears as many times as the number of RP11C/E controllers specified. Note that the queries for the interrupt vector, CSR, and the number of drives, occur one after the other for each RP11C/E controller. The repeat sequence repeats all three of the queries.

* IS THE FIRST DRIVE AN RPR02? [Y/N]:

* IS THE NEXT DRIVE AN RPR02? [Y/N]:

This query is repeated as many times as the number of drives previously specified.

;
; THE RWM03 IS A REMOVABLE PACK, RANDOM ACCESS DISK STORAGE
; SYSTEM WITH A STORAGE CAPACITY OF 33,710,080 WORDS PER PACK.
; EACH INCLUDES A CONTROL UNIT AND THE FIRST DISK PACK DRIVE AND
; IS EXPANDABLE TO EIGHT DRIVES.

SYSGEN DIALOGUE DETAILS

;
* HOW MANY RWM03 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: 4
;
; OFFSET RECOVERY IS A TECHNIQUE FOR READING DATA IN INSTANCES
; WHERE IT CANNOT OTHERWISE BE RECOVERED. IT INVOLVES MOVING THE
; DISK HEAD ON EITHER SIDE OF THE CYLINDER CENTERLINE IN AN
; ATTEMPT TO PICK UP A STRONGER SIGNAL AND THUS ALLOW DATA TO BE
; RECOVERED.

* DO YOU WANT OFFSET RECOVERY SUPPORT? [Y/N]:

Offset recovery is especially important in environments where disk packs are frequently moved from drive to drive. It is also recommended where a higher degree of data reliability is required.

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT RWM03 [O R:60:774 D:254]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:176700]:

* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]:

This query is repeated as many times as the number of RWM03 controllers specified. Note that the queries for the interrupt vector, CSR, and the number of drives, occur one after the other for each RWM03 controller. The repeat sequence repeats all three of the queries.

; THE TYPICAL RESPONSE TO THE NEXT QUESTION IS ZERO. A NONZERO
; RESPONSE SHOULD BE ARRIVED AT AFTER CONSULTATION WITH A DEC
; FIELD SERVICE REPRESENTATIVE.

* ENTER PHYSICAL UNIT NUMBER OF THE FIRST DRIVE [O D:0]:

;
; THE RJ/RWS03-04 USES THE RH11 CONTROLLER. THE RJ/RWS03 HAS A
; CAPACITY OF 256K WORDS; THE RJ/RWS04 HAS A CAPACITY OF 512K
; WORDS. TRANSFER RATE IS 4-MICROSECONDS PER WORD WITH AN
; AVERAGE LATENCY OF 8-MILLISECONDS.

;
* HOW MANY RJ/RWS03-04 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: 0

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT RJ/RWS03-04 [O R:60-774 D:204]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172040]:

* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]:

This query appears as many times as the number of RJ/RWS03-04 controllers specified.

; THE TYPICAL RESPONSE TO THE NEXT QUESTION IS ZERO; A NON-ZERO
; RESPONSE SHOULD BE ARRIVED AT AFTER CONSULTATION WITH A DEC
; FIELD SERVICE REPRESENTATIVE.

* ENTER PHYSICAL UNIT NUMBER OF THE FIRST DRIVE [O D:0]:

This query is repeated as many times as the number of RJ/RWS03-04 controllers specified. Note that the queries for the interrupt vector, CSR, number of drives, and the

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unit number of first drive occur one after the other for each RJ/RWS03-04 controller. The repeat sequence repeats all four of the queries.

* IS THE FIRST DRIVE AN RS03? [Y/N]:

* IS THE NEXT DRIVE AN RS03? [Y/N]:

RS03s and RS04s can be mixed on the same controller; specify N to indicate an RS04 unit. This query is repeated as many times as the number of drives previously specified.

; THE TC11-G IS A DUAL-UNIT BIDIRECTIONAL MAGNETIC-TAPE TRANSPORT
; SYSTEM FOR AUXILIARY DATA STORAGE.

; THE SYSTEM STORES INFORMATION AT FIXED POSITIONS ON MAGNETIC
; TAPE AS IN MAGNETIC DISK OR DRUM STORAGE DEVICES, RATHER THAN
; AT UNKNOWN OR VARIABLE POSITIONS AS IN CONVENTIONAL MAGNETIC
; TAPE SYSTEMS.

; A DECTAPE SYSTEM CONSISTS OF UP TO 4 DUAL TRANSPORTS, AND A
; CONTROL UNIT (WHICH WILL BUFFER AND CONTROL INFORMATION FOR UP
; TO FOUR DUAL TRANSPORTS). A TC11-G INCLUDES A CONTROL UNIT AND
; THE FIRST DUAL TAPE TRANSPORT.

* HOW MANY TC11 DECTAPE CONTROLLERS DO YOU HAVE? [D R:0.-16.]: ϕ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT TC11? [O R:60-774 D:214]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177342]:

* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]:

This query appears as many times as the number of TC11-G controllers specified. Note that the queries for the interrupt vector, command register, and the number of drives occur one after the other for each TC11 controller. The repeat sequence repeats all three of the queries.

; THE RX11 IS AN INDUSTRY-COMPATIBLE DISK STORAGE SYSTEM FOR
; FLEXIBLE (FLOPPY) DISKS. AN RX11 IS CAPABLE OF CONTROLLING TWO
; FLEXIBLE DISK DRIVES EACH HAVING A CAPACITY OF 128,128 16-BIT
; WORDS.

* HOW MANY RX11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: ϕ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT RX11? [O R:60-774 D:264]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177170]:

* HOW MANY DRIVES DOES IT HAVE? [O R:1-2]:

This query appears as many times as the number of RX11 controllers specified. Note that the queries for the interrupt vector, CSR, and the number of drives occur one after the other for each RX11 controller. The repeat sequence repeats all three of the queries.

SYSGEN DIALOGUE DETAILS

If the target system is a PDP-11/70 with extended memory support, then the next five questions are omitted. Note also that the VT11/VS60 driver cannot be loadable.

; THE VT11 IS A LOW COST, LINE DRAWING, GRAPHICS DISPLAY
; SUBSYSTEM, WHICH MAY BE PACKAGED IN THE GT SERIES OF DISPLAY
; SYSTEMS OR RUN SEPARATELY. VT11 SUPPORT IN RSX-11M HAS THE
; FOLLOWING RESTRICTIONS:

; ONLY ONE VT11 (OR VS60) IN THE SYSTEM,
; THE DRIVER DOES NOT OPERATE ON THE PDP-11/70 IN 22-BIT MODE,
; THE DISPLAY BUFFER OF THE TASK DRIVING THE VT11 MUST RESIDE
; COMPLETELY IN THE LOW 28K OF SYSTEM MEMORY.

* DO YOU HAVE A VT11 GRAPHICS DISPLAY SUBSYSTEM? [Y/N]: *N*

An affirmative reply to this query will exclude the high performance VS60 graphics display subsystem from your configuration. Hence a Y response to VT11 will inhibit the display of queries concerning the VS60.

; THE VECTOR ADDRESS FOR THE GRAPHICS DISPLAY SUBSYSTEMS IS
; ASSIGNED FROM THE FLOATING VECTOR SPACE STARTING AT 300.
; CONSULT FIELD SERVICE TO DETERMINE THE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE GRAPHICS SUBSYSTEM [O R:300-774]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172000]:

The following queries concerning the VS60 graphics display subsystem are displayed only if VT11 support was not selected.

; THE VS60 IS A HIGH PERFORMANCE, LINE DRAWING, GRAPHICS DISPLAY
; SUBSYSTEM. THE VS60 IS SUPPORTED IN RSX-11M WITH THE FOLLOWING
; RESTRICTIONS:

; - THE DRIVER DOES NOT OPERATE ON THE PDP-11/70 IN 22-BIT MODE,
; - ONLY ONE VS60 (OR VT11) IN THE SYSTEM.

* DO YOU HAVE A VS60 GRAPHICS DISPLAY SUBSYSTEM? [Y/N]: *N*

; the vs60 can drive two crt monitors independently.

* DOES IT DRIVE TWO CRT MONITORS? [Y/N]:

This query determines whether or not such functionality is desired.

* ENTER VECTOR ADDRESS OF THE GRAPHICS SUBSYSTEM [O R:300-774]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172000]:

; THE LP11 HIGH SPEED LINE PRINTER IS AVAILABLE IN EIGHT MODELS.

; LP11-F 80 COLUMN, 64 CHARACTER
; LP11-H 80 COLUMN, 96 CHARACTER
; LP11-J 132 COLUMN, 64 CHARACTER
; LP11-K 132 COLUMN, 96 CHARACTER
; LP11-R 132 COLUMN, 64 CHARACTER (HEAVY DUTY, HIGH SPEED)
; LP11-S 132 COLUMN, 96 CHARACTER (HEAVY DUTY, HIGH SPEED)
; LP11-V 132 COLUMN, 64 CHARACTER
; LP11-W 132 COLUMN, 96 CHARACTER

SYSGEN DIALOGUE DETAILS

; THE LS11 LINE PRINTER IS A MEDIUM-SPEED IMPACT DOT-MATRIX LINE
; PRINTER FOR THE PDP-11 FAMILY. THE LINE PRINTER PRINTS AT A
; RATE OF 165 CHARACTERS PER SECOND AT 10 CHARACTERS PER INCH
; WITH UP TO 132 CHARACTERS PER LINE.
;
; THE LA180 LINE PRINTER IS A DEC MANUFACTURED DEVICE SIMILAR TO
; THE LS11 WITH THE EXCEPTION THAT IT PRINTS AT THE RATE OF 180
; CHARACTERS PER SECOND.

; THE LV11 IS A HIGH-SPEED ELECTROSTATIC PRINTER-PLOTTER. ONLY
; THE PRINT OPTION IS SUPPORTED UNDER RSX-11M/S.

* HOW MANY LP/LS/LV11/LA180 LINE PRINTERS DO YOU HAVE? [D R:0-16]:]

; TO ENSURE MAXIMUM THROUGHPUT ON THE LP11-R OR LP11-S
; ANSWER YES TO THE NEXT QUESTION.

* DO YOU WANT FAST PRINTER SUPPORT? [Y/N]: ?

This option ensures maximum print throughput on the LP11-R
or LP11-S.

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: Y

* ENTER VECTOR ADDRESS OF THE NEXT LINE PRINTER? [O R:60-774 D:200]: D

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177514]: D

* IS IT AN LS11, LA180, OR LP11-V/W? [Y/N]: Y

Improper specification of the printer type may cause output
failures.

This query is repeated for each printer specified.

* IS IT A 132. COLUMN PRINTER? [Y/N]: Y

Improper specification of line width will cause buffer
truncation. An N or null response defaults to 80 columns.

This query appears as many times as the number of printers
specified. Note that the queries for the interrupt vector,
CSR, LS11, and line width occur one after the other for each
printer specified. The repeat sequence repeats all four of
the queries.

After the repeat sequence completes, the following is asked.

; YOU MAY OPTIONALLY SPECIFY THE NUMBER OF SECONDS BETWEEN PRINTER
; NOT READY MESSAGES. AN INTERVAL OF ZERO SUPPRESSES THE MESSAGES
; ALTOGETHER. THE DEFAULT IS 15. SECONDS. FOR THE MINIMUM SYSTEM
; YOU MUST ANSWER THE NEXT QUESTION YES.

* DO YOU WANT 15. SECONDS BETWEEN PRINTER NOT READY MESSAGES? [Y/N]: Y

If not, you are asked to specify the interval in seconds
that the message will be displayed. Printer not ready is
displayed on the console terminal.

* HOW MANY SECONDS BETWEEN NOT READY MESSAGES [D R:0.-255. D:15]:

; THE TJ/TWU/TWE16-45 IS A MAGNETIC TAPE SYSTEM IDEALLY SUITED FOR
; WRITING, READING, AND STORING LARGE VOLUMES OF DATA AND
; PROGRAMS IN A SERIAL MANNER. THE 10 1/2-INCH TAPE REELS

SYSGEN DIALOGUE DETAILS

; CONTAIN UP TO 2400 FEET OF TAPE. THE TAPE IS 9-TRACK, RECORDED
; EITHER NRZI OR PHASE ENCODED WITH RECORDING DENSITIES OF 800 OR
; 1600 BPI.

* HOW MANY TM02/03 MAGTAPE CONTROLLERS HAVE YOU? [O R:0.-16.]: |

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: Y

* ENTER VECTOR ADDRESS OF THE NEXT TJ/TWU/TWE16-45? [O R:60-774 D
D:224]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172 440]: D

* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]: |

This query appears as many times as the number of
TJ/TWU16-45 controllers specified.

; THE TYPICAL RESPONSE TO THE NEXT QUESTION IS ZERO; A NON-ZERO
; RESPONSE SHOULD BE ARRIVED AT AFTER CONSULTATION WITH A DEC
; FIELD SERVICE REPRESENTATIVE.

* ENTER PHYSICAL UNIT NUMBER OF THE TM02/03 FORMATTER [O D:0]: φ

This query appears as many times as the number of
TJ/TWU16-45s specified. Note that the queries for the
interrupt vector, CSR, the number of drives, and the
physical unit number occur one after the other for each
TJ/TWU16-45. The repeat sequence repeats all four of the
queries.

; THE TM/TMA/TMB11 IS A MAGNETIC TAPE SYSTEM IDEALLY SUITED FOR
; WRITING, READING, AND STORING LARGE VOLUMES OF DATA AND
; PROGRAMS IN A SERIAL MANNER. THE SYSTEM READS AND WRITES IN
; INDUSTRY-COMPATIBLE FORMAT. TM11/TU/E10 DRIVES SUPPORT 10.5-INCH
; REELS CONTAINING UP TO 2400 FEET OF TAPE UPON WHICH OVER 180
; MILLION BITS OF DATA CAN BE STORED ON HIGH DENSITY 9-TRACK TAPE
; OR OVER 140 MILLION BITS CAN BE STORED ON HIGH DENSITY 7-TRACK
; TAPE. TM11/TS03 DRIVES SUPPORT 7-INCH REELS CONTAINING UP TO
; 600 FEET OF TAPE IN HIGH DENSITY 9-TRACK FORMAT. TMB11/TU10W
; DRIVES ARE COMPATIBLE WITH TU10 DRIVES EXCEPT THEY OPERATE ONLY
; ON 800 BPI, 9-TRACK TAPE.

* HOW MANY TM/TMA/TMB11 MAGTAPE CONTROLLERS HAVE YOU [D R:0.-16.] φ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT TM/TMA/TMB11? [O R:60-774 D:224]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172522]:

* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]:

This query appears as many times as the number of
TM/TMA/TMB11s specified. Note that the queries for the
interrupt vector, command register, and the number of drives
occur one after the other for each controller. The repeat
sequence repeats all three of the queries.

; THE PC11 IS A HIGH SPEED PAPER TAPE READER/PUNCH THAT IS
; CAPABLE OF READING EIGHT-HOLE UNOILED PERFORATED PAPER TAPE AT
; 300 CHARACTERS PER SECOND, AND PUNCHING TAPE AT 50 CHARACTERS
; PER SECOND.

SYSGEN DIALOGUE DETAILS

?

- * HOW MANY PC11 PAPER TAPE READER/PUNCHES DO YOU HAVE? [D R:0.-16.]: 1
- * DO YOU WANT THE DRIVERS TO BE LOADABLE? [Y/N]: Y

The answer to this query determines whether both or neither of the two paper tape drivers (PRDRV and PPDRV) are to be loadable.

- * ENTER VECTOR ADDRESS OF THE NEXT PC11? [O R:60-774 D:70]: 0
- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177550]: 0

; THE PR11 IS A HIGH SPEED PAPER TAPE READER THAT IS CAPABLE OF
 ; READING EIGHT-HOLE UNOILED PERFORATED PAPER TAPE AT 300
 ; CHARACTERS PER SECOND.
 ; EXCLUDE THE NUMBER OF PC11'S, IF ANY,
 ; FROM THE ANSWER TO THE NEXT QUESTION.

- * HOW MANY PR11 PAPER TAPE READERS DO YOU HAVE? [D R:0.-16.]: 0
- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:
- * ENTER VECTOR ADDRESS OF THE NEXT PR11? [O R:60-774 D:70]:
- * WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177550]:

NOTE

; THE OPERATOR CONSOLE MUST BE ATTACHED
 ; VIA A DL11.

; THE DL11 SERIES OF ASYNCHRONOUS SINGLE LINE INTERFACES HANDLE
 ; FULL OR HALF DUPLEX COMMUNICATION BETWEEN A WIDE VARIETY OF
 ; SERIAL COMMUNICATION CHANNELS AND A PDP-11 COMPUTER.

; WITH A DL11 INTERFACE, A PDP-11 COMPUTER CAN COMMUNICATE WITH A
 ; LOCAL TERMINAL SUCH AS A CONSOLE TELEPRINTER.
 ; INCLUDE CONSOLE IN THE ANSWER TO
 ; THE NEXT QUESTION.

- * ENTER NUMBER OF DL11 LINE INTERFACES [D R: 1.-8.]: 3

For RSX-11M systems, at least one DL11 must be generated in the system; there is no DL11 requirement for RSX-11S systems. If the answer to this query is nonzero, then the next three queries appear. Otherwise they are not displayed.

?
 if direct connect, can DL11-E be included

The driver services terminals that are connected to a DL11-A/B/C/D/W only. The DL11-E requires a separate driver.

; THE TERMINAL DRIVER CAN ONLY BE LOADED BY VMR.

- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: N

; 60 IS THE STANDARD VECTOR ADDRESS FOR THE FIRST DL11.
 ; ADDITIONAL VECTORS ARE ASSIGNED FROM THE FLOATING VECTOR SPACE
 ; STARTING AT 300. CONSULT FIELD SERVICE TO DETERMINE LOCATIONS
 ; IF UNKNOWN.

- * ENTER VECTOR ADDRESS OF THE NEXT DL11 [O R:60-774 D:60]: 0

SYSGEN DIALOGUE DETAILS

; 177560 IS THE STANDARD CSR ADDRESS FOR THE FIRST DL11.
; ADDITIONAL DL11 CSR ADDRESSES ARE ASSIGNED IN THE RANGE 176000
; TO 176770. CONSULT FIELD SERVICE TO DETERMINE LOCATIONS IF
; UNKNOWN.

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177560]: D

; THE DH11 MULTIPLEXER CONNECTS THE PDP-11 WITH 16 ASYNCHRONOUS
; SERIAL COMMUNICATIONS LINES OPERATING WITH INDIVIDUALLY
; PROGRAMMABLE PARAMETERS. THESE PARAMETERS ARE:
;
; TRANSMITTER SPEED (BAUD)
; RECEIVER SPEED (BAUD)

* ENTER NUMBER OF DH11 ASYNCHRONOUS LINE MULTIPLEXERS [D R:0.-16.]: ϕ

; THE TERMINAL DRIVER CAN ONLY BE LOADED BY VMR.

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

If a DL11 has been included in the system, the loadable driver question will be suppressed because these controllers are supported by the same driver.

; REMOTE LINES WILL OCCUPY CONSECUTIVE LINE LOCATIONS, AND IF
; MORE THAN 16 REMOTE LINES ARE SPECIFIED THEY MUST ALSO OCCUPY
; CONSECUTIVE DH11'S. ASSIGNMENT OF LINES IS BY GROUPS OF 4.

Note that in the following question, x is replaced by 16 times the number of DH11s specified.

* ENTER TOTAL NUMBER OF DIAL UP LINES [D R:0.-x.]:

If the reply to this question is zero, the next two queries are omitted. If DM11-BB modem support is selected, the initial dial-in terminal baud rate must be specified. The available baud rates are 110, 150, or 300. The selected baud rate applies to all dial-in lines serviced by any DM11-BB.

; THE BAUD RATE AT WHICH ALL REMOTE LINES ARE ANSWERED MAY BE SET
; TO 110, 150, OR 300 BAUD.

* DO YOU WANT TO ANSWER AT 110 BAUD? [Y/N]:

* DO YOU WANT TO ANSWER AT 150 BAUD? [Y/N]:

If both of these queries are answered negatively, the initial dial-in baud rate is set to 300.

; LOCAL LINES WILL ALSO OCCUPY CONSECUTIVE LINES AND DH11'S.
; THEIR ASSIGNMENT FOLLOWS THE ASSIGNMENT OF ANY REMOTE LINES
; SPECIFIED.

; LOCAL LINES CAN BE EITHER EIA OR 20 MILLIAMP. EACH TYPE MUST
; HAVE AN APPROPRIATE INTERFACE, AND THE INTERFACE SERVICES A
; GROUP OF FOUR LINES OF THE SAME TYPE. THE RESPONSE TO THE
; LOCAL LINE QUERY MAY BE LARGER THAN THE ACTUAL NUMBER OF LOCAL
; LINES, SINCE ALLOCATION IS BY GROUPS OF FOUR. HENCE IF SIX EIA
; LINES ARE INSTALLED, TWO LINE GROUP SLOTS, WHICH CONTAIN EIGHT
; LINES, ARE NEEDED.

; THE REQUIRED RESPONSE TO THE LOCAL LINE QUERY CAN BE CALCULATED
; BY SUMMING THE NUMBER OF EIA AND 20 MILLIAMP LINE GROUPS (EACH

SYSGEN DIALOGUE DETAILS

; LINE GROUP CONTAINS SLOTS FOR FOUR LINES) AND MULTIPLYING BY
; FOUR.

Note that in the following question, x is replaced by 16
times the number of DH11s minus the number of dial-up lines.

* ENTER TOTAL NUMBER OF LOCAL LINES [D R:0.-x.]:

; THE VECTOR ADDRESS FOR THE DH11 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT DH11 [O R:300-774]:

; THE CSR ADDRESS FOR THE DH11 IS ASSIGNED FROM THE FLOATING
; ADDRESS SPACE STARTING AT 160010. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700]:

; THE VECTOR ADDRESS FOR THE DM11-BB IS ASSIGNED FROM THE
; FLOATING VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE
; TO DETERMINE THE LOCATION IF UNKNOWN. IF A USER HAS SPECIFIED
; THE EXISTENCE OF REMOTE DIAL-UP LINES THE DM11-BB INTERFACE IS
; REQUIRED. ONE DM11-BB CAN SERVICE UP TO 16 REMOTE DIAL-UP
; LINES.

* ENTER VECTOR ADDRESS OF THE NEXT DM11-BB [O R:300-744]:

If the reply to the query for the number of remote lines was
nonzero, this query is repeated for each DM11-BB that is
required.

* WHAT IS ITS CSR ADDRESS? [O R:16000-177700 D:170500]:

If the reply to the query for the number of remote lines was
nonzero, this query is repeated for each DM11-BB that is
required. Note that the queries for remote dial-up lines,
local lines, DH11 interrupt vector, DH11 CSR, DM11-BB
interrupt vector, and DM11-BB CSR occur one after the other
for each DH11. The repeat sequence repeats all 6 of the
queries as appropriate.

; THE DJ11 IS A MULTIPLEXER INTERFACE BETWEEN 16 ASYNCHRONOUS
; SERIAL DATA-COMMUNICATION CHANNELS AND THE PDP-11 UNIBUS. THE
; DJ11 IS A UNIT WHOSE CHARACTER FORMATS AND OPERATING SPEEDS ARE
; JUMPER OR STRAP SELECTABLE IN GROUPS OF FOUR LINES.

* ENTER NUMBER OF DJ11 ASYNCHRONOUS LINE MULTIPLEXERS [D R:0.-16.]: ϕ

; THE TERMINAL DRIVER CAN ONLY BE LOADED BY VMR.

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

If a DL11 or DH11 has been included in the system, the
loadable driver question will be suppressed because these
controllers are supported by the same driver.

; THE VECTOR ADDRESS FOR THE DJ11 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT DJ11 [O R:300-774]:

SYSGEN DIALOGUE DETAILS

If the reply to the query for the number of DJ11s was nonzero, this query is repeated for each DJ11.

; THE CSR ADDRESS FOR THE DJ11 IS ASSIGNED FROM THE FLOATING
; ADDRESS SPACE STARTING AT 160010. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

* WHAT IS ITS CSR ADDRESS? [O R: 160010-177700]:

* HOW MANY LINES DOES IT HAVE? [D R:1.-16.]:

This query appears as many times as the number of DJ11s specified. Note that the queries for the interrupt vector, CSR, and the number of lines occur one after the other for each DJ11. The repeat sequence repeats all three of the queries.

; THE DZ11 MULTIPLEXER CONNECTS THE PDP-11 WITH 8 ASYNCHRONOUS
; SERIAL COMMUNICATIONS LINES OPERATING WITH INDIVIDUALLY
; PROGRAMMABLE PARAMETERS. THESE PARAMETERS ARE:

; TRANSMITTER SPEED (BAUD)
; RECEIVER SPEED (BAUD)
; THE DZ11-E MULTIPLEXER SHOULD BE TREATED AS TWO DZ11'S. THUS IF
; YOU HAVE 1 DZ11-E ANSWER THE NEXT QUESTION WITH 2.

* ENTER NUMBER OF DZ11 ASYNCHRONOUS MULTIPLEXERS [D R:0.-16.]: 2

; THE TERMINAL DRIVER CAN ONLY BE LOADED BY VMR.

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: N

If a DL11, DH11, or DJ11 has been included in the system, the loadable driver question will be suppressed because these controllers are supported by the same driver.

; THE DZ11 HAS THE ABILITY TO MAINTAIN A FULL DUPLEX CONNECTION
; THROUGH A BELL 103A TYPE MODEM. MODEM SUPPORT REQUIRES ADDED
; CODE IN THE TERMINAL DATA BASE AS WELL AS IN THE DRIVER, AND
; @NCVEASES SYSTEMIOVERHEAD. AS A RESULT, IT SHOULD BE SELECTED
; ONLY IF NEEDED.

* DO ANY OF THE LINES REQUIRE MODEM SUPPORT? [Y/N]: Y

If the reply to this question is negative, the next two questions are omitted. If modem support is selected, the initial dial-in terminal baud rate must be specified. The available baud rates are 110, 150, or 300. The selected baud rate applies to all dial-in lines serviced by any DZ11.

; THE BAUD RATE AT WHICH ALL REMOTE LINES ARE ANSWERED MAY BE SET
; TO 110, 150, OR 300 BAUD.

* DO YOU WANT TO ANSWER AT 110 BAUD? [Y/N]: N

* DO YOU WANT TO ANSWER AT 150 BAUD? [Y/N]: N

If both of these queries are answered negatively, the initial dial-in baud rate is set to 300.

; THE VECTOR ADDRESS FOR THE DZ11 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

SYSGEN DIALOGUE DETAILS

* ENTER VECTOR ADDRESS OF THE NEXT DZ11 [O R:300-774]: ?

; THE CSR ADDRESS FOR THE DZ11 IS ASSIGNED FROM THE FLOATING
; ADDRESS SPACE STARTING AT 160010. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

* what is its csr address? [o r:160010-177700]:

* HOW MANY LINES DOES IT HAVE? [D R:1.-8.]: 8

; INTER-PROCESSOR COMMUNICATION DEVICES CONSIST OF THE FOLLOWING:

- ; - DAl1-B HIGH-SPEED PARALLEL UNIBUS LINK
- ; ✓- DL11-E ASYNCHRONOUS SERIAL LINE INTERFACE
- ; - DMC11 SYNCHRONOUS SERIAL LINE INTERFACE
- ; - DP11 SYNCHRONOUS SERIAL LINE INTERFACE
- ; - DQ11 HIGH-SPEED SYNCHRONOUS SERIAL LINE INTERFACE
- ; - DU11 SYNCHRONOUS SERIAL LINE INTERFACE
- ; ✓- DUP11 SYNCHRONOUS SERIAL LINE INTERFACE

* DO YOU HAVE ANY INTER-PROCESSOR COMMUNICATION DEVICES? [Y/N]: N

If you do, the pertinent queries concerning inter-processor communication devices are asked.

needed?

; THE DAl1-B UNIBUS LINK IS A HIGH-SPEED, HALF-DUPLEX CHANNEL FOR
; CONNECTING TWO PDP-11 COMPUTERS OVER A DISTANCE OF UP TO 100
; FEET (30 METERS). USING THE DIRECT-MEMORY-ACCESS FACILITIES OF
; EACH COMPUTER, IT IS CAPABLE OF TRANSFERRING BLOCKS OF DATA AT
; HIGH DATA RATES WITH MINIMAL PROCESSOR OVERHEAD.

* HOW MANY DAl1-B PARALLEL LINE INTERFACES DO YOU HAVE [D R:0.-16.]: φ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

* ENTER VECTOR ADDRESS OF THE NEXT DAl1-B [O R:60-774 D:124]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172414]:

; THE DL11-E SERIES OF ASYNCHRONOUS SINGLE LINE INTERFACES HANDLE
; FULL OR HALF DUPLEX COMMUNICATION BETWEEN A WIDE VARIETY OF
; SERIAL COMMUNICATION CHANNELS AND A PDP-11 COMPUTER.

* HOW MANY DL11-E ASYNC. LINE INTERFACES DO YOU HAVE? [D R:0.-16.]: φ

* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: Y

; THE VECTOR ADDRESS FOR THE DL11-E IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT DL11-E [O R:300-774]: ?

; THE CSR ADDRESS FOR THE DL11-E IS ASSIGNED FROM THE ADDRESS
; SPACE STARTING AT 175610. CONSULT FIELD SERVICE TO DETERMINE
; THE LOCATION IF UNKNOWN.

* WHAT IS ITS CSR ADDRESS? [O R:175610-177700]: ?

* IS IT A HALF DUPLEX LINE? [Y/N]: N

* HOW MANY SYNC CHAR.S ARE REQUIRED IN A SYNC LEADER? [D R:3.-14.]: 6

twice

SYSGEN DIALOGUE DETAILS

A typical response is 4-6. If the line is to run at high speeds or the expected system load is to be heavy, then specify a greater number of sync characters.

If the reply to the query for the number of DL11-Es was greater than 1, this query is repeated for each DL11-E. Note that the queries for interrupt vector, CSR, half duplex, and sync leader occur one after the other for each DL11-E. The repeat sequence repeats all four queries.

; THE DM11 IS A FULL-DUPLEX, SERIAL COMMUNICATIONS LINK WHICH
; IMPLEMENTS THE DDCMP LINE PROTOCOL USING A HIGH SPEED
; MICROPROCESSOR. DATA MESSAGES ARE TRANSFERRED WITH MINIMAL
; PROCESOR OVERHEAD USING THE DMA FACILITIES OF THE PDP-11.

* HOW MANY DM11 SYNC. LINE INTERFACES DO YOU HAVE? [D R:0.-16.]: ϕ
* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

; THE VECTOR ADDRESS FOR THE DM11 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT DM11 [O R:300-774]:

; THE CSR ADDRESS FOR THE DM11 IS ASSIGNED FROM THE FLOATING
; ADDRESS SPACE STARTING AT 160010. CONSULT FIELD SERVICE TO
; DETERMINE LOCATION IF UNKNOWN.

* WHAT IS ITS CSR ADDRESS? [O R:160010-177700]:
* IS IT A HALF DUPLEX LINE? [Y/N]:

The vector address, CSR address, and half duplex questions are repeated for each DM11 specified.

If the answer to the half duplex question is negative, the next query is omitted.

; WHEN THE DM11 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.

* IS IT THE PRIMARY STATION? [Y/N]:

; THE DP11 PROVIDES A DOUBLE-BUFFERED PROGRAM INTERRUPT INTERFACE
; BETWEEN A PDP-11 AND A SERIAL SYNCHRONOUS LINE.

; THE DP11 INTERFACE HANDLES A WIDE VARIETY OF TERMINALS AND LINE
; DISCIPLINES (I.E., LINE CONTROL PROCEDURES AND ERROR CONTROL
; TECHNIQUES). A PROGRAMMER CAN VARY SYNC CHARACTER, CHARACTER
; SIZE, AND MODEM CONTROL LEADS. AUTOMATIC SYNC CHARACTER
; STRIPPING AND AUTOMATIC IDLING ARE ALSO PROGRAM SELECTABLE.
; WHILE IDLING, THE DP11 TRANSMITS THE CONTENTS OF THE SYNC BUFFER.

* HOW MANY DP11 SYNC LINE INTERFACES DO YOU HAVE? [O R:0.-16.]: ϕ

; THE VECTOR ADDRESS FOR THE DP11 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT DP11 [O R:300-774]:

* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:174770]:

* IS IT A HALF DUPLEX LINE? [Y/N]:

* HOW MANY SYNC CHAR.S ARE REQUIRED IN A SYNC LEADER? [D R:3.-14.]:

SYSGEN DIALOGUE DETAILS

A typical response is 4-6. If the line is to run at high speeds or the expected system load is to be heavy, then specify a greater number of sync characters.

If the reply to the query for the number of DP11s was greater than 1, this query is repeated for each DP11. Note that the queries for interrupt vector, CSR, half duplex, and sync leader occur one after the other for each DP11. The repeat sequence repeats all four queries.

; THE DQ11 IS A HIGH-SPEED, DOUBLE BUFFERED COMMUNICATIONS DEVICE
; DESIGNED TO INTERFACE THE PDP-11 PROCESSOR TO A SERIAL
; SYNCHRONOUS COMMUNICATION LINE. USING THE DIRECT-MEMORY-ACCESS
; FACILITIES OF THE PDP-11, IT IS CAPABLE OF TRANSFERRING BLOCKS
; OF DATA AT HIGH DATA RATES WITH MINIMAL PROCESSOR OVERHEAD.

* HOW MANY DQ11 SYNC. LINE INTERFACES DO YOU HAVE? [D R: 0.-16.]: ϕ
* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

; THE VECTOR ADDRESS FOR THE DQ11 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT DQ11 [O R:300-774]:

; THE CSR ADDRESS FOR THE DQ11 IS ASSIGNED FROM THE FLOATING
; ADDRESS SPACE STARTING AT 160010. CONSULT FIELD SERVICE TO
; DETERMINE LOCATION IF UNKNOWN.

* WHAT IS ITS CSR ADDRESS? [O R:160010-177700]:
* IS IT A HALF DUPLEX LINE? [Y/N]:
* DOES IT HAVE THE ERROR DETECTION EXPANDER UNIT? [Y/N]:
* DOES IT HAVE THE CHARACTER DETECTION EXPANDER UNIT? [Y/N]:
* HOW MANY SYNC CHAR.S ARE REQUIRED IN A SYNC LEADER? [D R:3.-14.]:

A typical response is 4-6. If the line is to run at high speeds or the expected system load is to be heavy, then specify a greater number of sync characters.

If the reply to the query for the number of DQ11s was greater than 1, this query is repeated for each DQ11. Note that the queries for interrupt vector, CSR, half duplex, error detection, character detection, and sync leader occur one after the other for each DQ11. The repeat sequence repeats all six queries.

; THE D111 PROVIDES A DOUBLE-BUFFERED PROGRAM INTERFACE BETWEEN A
; PDP-11 AND A SERIAL SYNCHRONOUS LINE.

; THE D111 PROVIDES A FLEXIBLE INTERFACE IN THAT THE PROGRAMMER
; CAN SPECIFY THE SYNC AND CHARACTER SIZE. MODEM CONTROL
; CAPABILITY ALLOWS THE USE OF THE D111 IN SWITCHED OR DEDICATED
; APPLICATIONS. THE INTERFACE PROVIDES STRIP SYNC AND IDLE SYNC
; FEATURES TO SIMPLIFY PROGRAMMING AND REMOVE PROCESSOR OVERHEAD.

* HOW MANY D111 SYNC. LINE INTERFACES DO YOU HAVE? [D R:0.-16.]: ϕ
* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:

; THE VECTOR ADDRESS FOR THE D111 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

* ENTER VECTOR ADDRESS OF THE NEXT D111 [O R:300-774]:

SYSGEN DIALOGUE DETAILS

; THE CSR ADDRESS FOR THE DULL IS ASSIGNED FROM THE FLOATING
; ADDRESS SPACE STARTING AT 160010. CONSULT FIELD SERVICE TO
; DETERMINE LOCATION IF UNKNOWN.

- * WHAT IS ITS CSR ADDRESS? [O R:160010-177700]:
- * IS IT A HALF DUPLEX LINE? [Y/N]:
- * HOW MANY SYNC CHAR.S ARE REQUIRED IN A SYNC LEADER? [D R:3.-14.]:

A typical response is 4-6. If the line is to run at high speeds or the expected system load is to be heavy, then specify a greater number of sync characters.

If the reply to the query for the number of DULLs was greater than 1, this query is repeated for each DULL. Note that the queries for interrupt vector, CSR, half duplex, and sync leader occur one after the other for each DULL. The repeat sequence repeats all four queries.

; THE DUP11 PROVIDES A DOUBLE-BUFFERED PROGRAM INTERFACE BETWEEN A
; PDP-11 AND A SERIAL SYNCHRONOUS LINE.

; THE DUP11 PROVIDES A FLEXIBLE INTERFACE IN THAT THE PROGRAMMER
; CAN SPECIFY THE SYNC AND CHARACTER SIZE. MODEM CONTROL
; CAPABILITY ALLOWS THE USE OF THE DUP11 IN SWITCHED OR DEDICATED
; APPLICATIONS. THE INTERFACE PROVIDES STRIP SYNC AND IDLE SYNC
; FEATURES TO SIMPLIFY PROGRAMMING AND REMOVE PROCESSOR OVERHEAD.

- * HOW MANY DUP11 SYNC. LINE INTERFACES DO YOU HAVE? [D R:0.-16.]: ϕ
- * DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]: \times

; THE VECTOR ADDRESS FOR THE DUP11 IS ASSIGNED FROM THE FLOATING
; VECTOR SPACE STARTING AT 300. CONSULT FIELD SERVICE TO
; DETERMINE THE LOCATION IF UNKNOWN.

- * ENTER VECTOR ADDRESS OF THE NEXT DUP11 [O R:300-774]: \uparrow

; THE CSR ADDRESS FOR THE DUP11 IS ASSIGNED FROM THE FLOATING
; ADDRESS SPACE STARTING AT 160010. CONSULT FIELD SERVICE TO
; DETERMINE LOCATION IF UNKNOWN.

- * WHAT IS ITS CSR ADDRESS? [O R:160010-177700]:
- * IS IT A HALF DUPLEX LINE? [Y/N]: \bullet
- * HOW MANY SYNC CHAR.S ARE REQUIRED IN A SYNC LEADER? [D R:3.-14.]: \bullet

A typical response is 4-6. If the line is to run at high speeds or the expected system load is to be heavy, then specify a greater number of sync characters.

The vector address, CSR address, half duplex, and sync character questions are repeated for each DUP11 specified.

END PERIPHERAL OPTIONS

There is a significant delay at this point while device tables are generated for the null device and network device (if selected) and tables for all of the standard pseudo-devices.

;
; AT THIS POINT WE RENAME THE ASSEMBLY COMMAND FILE
; AND THE SYSTEM BUILD COMMAND FILE TO [11,2x]

SYSGEN DIALOGUE DETAILS

;
PIP [11,2x]/RE=RSXASM.COMD;* ,RSXBLD.COMD;*

SGN runs under UIC [11,10] and produces five files which are recorded in the [11,10] file directory. Command files are conventionally stored in [11,20] or [11,24]. The preceding PIP commands, only one of which is actually issued, puts the command files into the proper directory.

* DID YOU ANSWER THE SYSGEN QUESTIONS TO YOUR SATISFACTION? [Y/N]: Y

If, for any reason, the query section dialogue included responses that would result in a user-tailored Executive which did not reflect the user's intentions, an N response to this query causes the files created by the query section to be deleted and the query section restarted. If the response is N, the following lines are displayed:

;
; IF YOU HAVE A REASONABLY GOOD UNDERSTANDING OF RSX-11M AND THE
; SYSGEN PROCESS (AIDED BY LISTING OF SGNEXEC, SGNPER, AND SGNTT)
; YOU CAN CORRECT MOST MINOR ERRORS BY EDITING THE FOLLOWING FILES:
; [11,10]RSXMC.MAC - EXECUTIVE OPTIONS, PERIPHERAL COMPONENTS
; [11,10]SYSTB.MAC - PERIPHERAL'S DATA BASES (DCB'S,UCB'S,SCB'S)
; [11,2X]RSXASM.COMD - TO CHANGE LISTING DEVICE, ETC.
; [11,2X]RSXBLD.COMD - TO CHANGE MAP DEVICE, ETC.
;

;
; NOTE THAT CORRECTING ICS/ICR-11 AND UDC ERRORS BY EDITING IS NOT
; RECOMMENDED.
;

;
; THE ALTERNATIVE TO EDITING THESE FILES IS TO RUN THROUGH THE ENTIRE
; QUERY SECTION AGAIN.
;

* DO YOU WANT TO RESTART THE QUERY SECTION? [Y/N]:

If you do not want to restart the query section, SYSGEN displays

; WE WILL PAUSE SO YOU CAN EDIT THE FILES.

Otherwise, the query section is restarted.

If no errors occurred during the running of the three query files, SYSGEN processing continues here.

;
; IF YOU ARE BUILDING A SPECIALIZED SYSTEM YOU
; MAY WISH TO EDIT THE FILES WHICH ARE PRODUCED
; BY THE QUERY SECTION.
;

* DO YOU WANT TO EDIT ANY OF THE QUERY SECTION OUTPUT FILES? [Y/N]:

If the answer is Y, SYSGEN will pause to let you edit the output files. When you are finished editing, type RES AT. to continue SYSGEN.

If LP:, NL:, or SY: was specified as the listing device, the next section is bypassed.

In the following lines it is assumed that DK1: was specified as the listing device.

* IS DK1: ALREADY INITIALIZED AND MOUNTED? [Y/N]:

SYSGEN DIALOGUE DETAILS

If it has been, the queries concerning it are skipped.

ALL DK1:

DMO DK1:

```
;
; PLACE A FORMATTED DISK IN DK1: (WRITE-ENABLED).
;
* IS THE DISK READY IN DK1:? [Y/N]
```

This question causes the indirect file processor to suspend itself until the disk reaches operating speed. When the disk is ready, the user answers Y to this question.

```
* IS THE DISK IN DK1: INITIALIZED AS A FILES-11 VOLUME? [Y/N]:
```

```
* WHAT IS ITS LABEL? [S]:
```

If the disk is not initialized, an N answer will cause the disk to be initialized by the following commands, which install task INI, initialize the disk, and then remove INI. If the disk is already initialized, processing continues with the Mount (MOU) command.

```
INS [1,5y]INI
INI DK1:LIST/BAD=[AUTO]
REM INI
```

Whether or not the disk needs to be initialized, DK1: processing continues at this point.

```
MOU DK1:LIST
MOU DK1:/OVR
INS [1,5y]UFD
SET /UIC=[1,1]
UFD DK1:[11,3x]
REM UFD
```

```
* WAS DK1: MOUNTED SUCCESSFULLY? [Y/N]:
* WAS THE UFD CREATED (OR ALREADY ON THE DISK)? [Y/N]:
```

If any error messages appeared when the MOU and UFD commands were issued, the user answers N to this question, and processing resumes with the SYSGEN prompt IS DK1: INITIALIZED AND MOUNTED, as given above.

Processing continues at this point.

```
;
; NOW WE ASSEMBLE THE EXECUTIVE
;
INS $MAC
INS $BIGMAC/PAR=PAR14K
```

The proper version of MACRO-11 is installed, according to whether or not the host system has at least 24K of memory. BIGMAC is the assembler of choice in this case, and is always chosen when at least 24K of memory is available.

```
; ASSEMBLING THE EXECUTIVE TAKES ANYWHERE FROM 20
; MINUTES (ON AN 11/70) TO 2 HOURS (ON AN 11/10).
; TAKE A BREAK.
```


SYSGEN DIALOGUE DETAILS

```
SET /UIC=[11,2x]
TIM
MAC @RSXASM
TIM
UNL LP:
```

The SET command establishes the default UIC. MACRO-11 is requested to run with RSXASM as an indirect command file. Note that MACRO-11 is running under [11,20] or [11,24] and, since RSXASM is part of an indirect file request, .CMD is the default file type. The assembly will require from 20 minutes to 2 hours to complete, depending upon the hardware available and the configuration of the target system.

If the DSS-11 and/or UDC-11 or ICS/ICR-11 was selected for the target system, the following text and commands are displayed:

```
;
; NOW WE ASSEMBLE THE MODULES NECESSARY FOR TASKS TO ACCESS
; UDC-11, DSS-11 OR ICS/ICR-11 I/O MODULE REGISTERS WITHIN
; THE I/O PAGE. I/O MODULE TYPES ACCESSED DIRECTLY ARE:
;
;
; ICS/ICR-11:
;
;         DIGITAL INPUT
;         COUNTER INPUT
;
; DSS-11 INPUTS
;
; UDC-11:
;
;         ANALOG OUTPUTS
;         SINGLE SHOT DIGITAL OUTPUTS
;         DIGITAL INPUTS
;         COUNTER INPUTS
```

If the ICS/ICR-11 was selected, the following question is asked:

* IS DIRECT ACCESS TO ICS/ICR-11 I/O MODULES REQUIRED? [Y/N]: Y

If the UDC-11 was selected, the following question is asked:

* IS DIRECT ACCESS TO UDC-11 I/O MODULES REQUIRED? [Y/N]:

If either of these questions is answered Y or if DSS-11 support was included, the following text is displayed:

```
;
; IN AN UNMAPPED SYSTEM ACCESS TO I/O MODULES IS
; THROUGH UNRESTRICTED REFERENCE TO THE I/O PAGE
; OR VIA A GLOBAL COMMON BLOCK THAT OCCUPIES THE SET
; OF PHYSICAL LOCATIONS RESERVED FOR THE DEVICE REGIS-
; TERS. IF YOU WISH TO ACCESS THE DEVICE THROUGH THE
; COMMON BLOCK, YOU MUST EDIT THE FILE RSXMC.MAC UNDER
; UFD [11,10], AS SHOWN IN THE FOLLOWING EXAMPLE:
;
```

Note, if you include the FORTRAN callable process I/O routines (See the RSX-11M I/O Drivers Reference Manual), the global common block is required. These are also required on an unmapped system.

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For ICS/ICR-11::

```
; *PL I$$C11
; I$$C11=0
; *I I$$COM=0
;
```

for DSS-11:

```
; *T
; *PL I$$S11
; I$$S11=1
; *I I$$SCM=0
;
```

FOR UDC11

```
; *PL U$$D11
; U$$D11=0
; *I U$$DCM=0
```

Finally:

```
; *ED
```

In either case, the following question is asked:

* DO YOU HAVE TO EDIT FILE RSXMC.MAC? [Y/N]: N

If this question is answered Y, the following commands are issued:

```
INS [1,5y]EDI
EDI [11,10]RSXMC.MAC
```

You should now perform the required edits. The Line Text Editor (EDI) is then removed and the correct modules assembled.

REM EDI

```
MAC [11,2x]ICTAB.ICR,[11,3x]ICTAB/-SP=[11,10]ICTAB
MAC [11,2x]ICOM.ICR,[11,3x]ICOM/-SP=[11,10]RSXMC,ICOM
MAC [11,2x]UDCOM.UDC,[11,3x]UDCOM/-SP=[11,10]RSXMC,UDCOM
MAC [11,2x]ISCOM.IDS,[11,3x]ISCOM/-SP=[11,10]RSXMC,ISCOM
MAC [11,2x]DSSDI.IDS,[11,3x]DSSDI/-SP=[11,10]RSXMC,DSSDI
```

Whether or not DSS-11 and/or UDC-11 or ICS/ICR-11 support is selected, all processing continues here.

REM MAC

The disk for Exec listings is dismounted.

DMO DK1:

```
;
; NOW WE BUILD THE CONCATENATED OBJECT MODULE FILE
; FOR THE EXECUTIVE.
;
```

The assembly of the Executive results in the creation of a number of individual object module files. These individual files can be concatenated into a single file with a substantial savings in disk space. Later, during the build

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phase, the Task Builder processes a library produced from this concatenated file to create the task image of the user-tailored Executive.

```
PIP RSX.OBS=*.OBJ
PIP RSX11M.OBJ/RE=RSX.OBS
PIP RSX11S.OBJ/RE=RSX.OBS
```

All existing object files cataloged under the default UFD are concatenated as a result of this command. The file RSX.OBS is then renamed RSX11M.OBJ if an RSX-11M system is being generated, or RSX11S.OBJ if an RSX-11S system is being generated.

At this point, processing of SYSGEN.CMD is dependent on the type of distribution kit you are using. For those using the single RK05 distribution kit, the queries and text under the heading SECONDARY STORAGE FOR SINGLE RK05 are applicable. For those using the dual RK05 distribution kit, the queries and text under the heading DUAL RK05 TRANSFER are applicable. Those using any other distribution kit are asked the next question, since all files, needed are on the disk.

* DO YOU WANT TO GO DIRECTLY TO THE NEXT PHASE OF THIS SYSGEN? [Y/N]:

Since all files needed for a SYSGEN reside on an RK06, RL01, RM03, or an RP disk, it is possible to invoke SYSGEN phase 2 immediately. If this question is answered Y, the SYSGEN phase 2 command file will be entered.

For RSX-11M SYSGEN, the command file selected will be [200,200]SYSGEN2.CMD. For RSX-11S SYSGEN, the command file selected will be [200,200]11SGEN.CMD. After phase 2, the command file will exit.

```
; WHEN THIS COMMAND FILE IS FINISHED, YOU MAY CONTINUE WITH
; THE NEXT PHASE OF THIS SYSGEN WITH THE FOLLOWING COMMAND:
;
; @SYSGEN2
; @11SGEN
```

If SYSGEN phase 2 on RP disk is not selected, it may be done manually at a later time by following the directions given at the end of the SYSGEN command file. At this point, RP processing terminates and the command file will exit.

```
*****SECONDARY STORAGE*****
***FOR***
*****SINGLE RK05*****
```

For purposes of SYSGEN using the single RK05 distribution kit, the following section is necessary to determine the secondary storage device. Secondary storage devices can be one of the following:

1. An RK05 disk
2. A cassette tape
3. A DECTape

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4. A magtape

5. An RX01 floppy disk

Questions are asked until one of these configuration types is established. For disk-tape configurations, two files, RSXBLD.CMD and RSX11M.OBJ, must be copied to backup tape for later restoration to the object disk. In addition, if the UDC-11 was included, the common block module UDCOM.UDC must be copied. If the ICS/ICR-11 was included, the files ICOM.ICR and ICTAB.ICR must be copied.

```
;  
; NOW WE COPY THE BUILD COMMAND FILE, THE ASSEMBLY PREFIX  
; FILE, THE UDC, DSS OR ICS/ICR FILES AND THE CONCATENATED  
; OBJECT MODULES TO SECONDARY STORAGE.  
;
```

```
SET /UIC=[1,2x]
```

* IS YOUR SECONDARY STORAGE DEVICE AN RK05 DISK? [Y/N]:

The following instructions and commands are executed if the system has as a secondary storage device an RK05 disk.

* ENTER DEVICE FOR SECONDARY DISK [S]:

For the following commands, it is assumed as an example, that DK1: is the device entered.

```
;  
; PUT THE UNMAPPED OBJECT DISK IN DK1:  
; PUT THE MAPPED OBJECT DISK IN DK1:  
; AND MAKE SURE THAT THE DRIVE IS WRITE ENABLED.  
;
```

* IS THE DISK IN DK1: READY? [Y/N]:

```
MOU DK1:MAPOBJ  
MOU DK1:UNMOBJ  
PIP DK1:/NV=[11,2x]RSXBLD.CMD,RSX11M.OBJ  
PIP DK1:/NV=[11,2x]RSXBLD.CMD,RSX11S.OBJ  
PIP DK1:/NV=[11,2x]UDCOM.UDC  
PIP DK1:/NV=[11,2x]ICOM.ICR,ICTAB.ICR  
PIP DK1:/NV=[11,2x]ISCOM.IDS,DSSDI.IDS  
PIP DK1:[200,200]/NV=[11,10]RSXMC.MAC  
DMO DK1:
```

```
INS [1,5y]FLX
```

All other configurations, except the RX01, require the File Transfer Program (FLX) to copy the files to the medium. Thus, the proper version of FLX is installed.

* IS YOUR SECONDARY STORAGE DEVICE A CASSETTE TAPE? [Y/N]:

The following instructions and commands are executed if the system has as a secondary storage device cassette tape.

```
;  
; PUT A BLANK CASSETTE IN DRIVE 0  
;  
* IS THE BLANK CASSETTE IN DRIVE 0 READY? [Y/N]:  
LOA CT:  
FLX CT:/ZE  
FLX CT:/VE/BS:512.=[11,2x]RSXBLD.CMD/RS,RSX11M.OBJ  
FLX CT:/VE/BS:512.=[11,2x]RSXBLD.CMD/RS,RSX11S.OBJ
```

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```
FLX CT:/VE/BS:512.=[11,2x]UDCOM.UDC/FB/RS
FLX CT:/VE/BS:512.=[11,2x]ICTAB.ICR/RS/FB,ICOM.ICR/FB
FLX CT:/VE/BS:512.=[11,2x]DSSDI.IDS/RS/FB,ISCOM.IDS/FB
FLX CT:/VE/BS:512.=[11,10]RSXMC.MAC/RS
```

* IS YOUR SECONDARY STORAGE DEVICE A DECTAPE? [Y/N]:

The following instructions and commands are executed if the system has as a secondary storage device a DECTape.

```
;
; PUT A BLANK DECTAPE IN DRIVE 0
;
* IS THE BLANK DECTAPE IN DRIVE 0 READY? [Y/N]:
LOA DT:
FLX DT:/ZE
FLX DT:/DO=[11,2x]RSXBLD.CMD/RS,RSX11M.OBJ
FLX DT:/DO=[11,2x]RSXBLD.CMD/RS,RSX11S.OBJ
FLX DT:/DO=[11,2x]UDCOM.UDC/FB/RS
FLX DT:/DO=[11,2x]ICTAB.ICR/RS/FB,ICOM.ICR/FB
FLX DT:/DO=[11,2x]DSSDI.IDS/RS/FB,ISCOM.IDS/FB
FLX DT:/DO=[11,10]RSXMC.MAC/RS
```

* IS YOUR SECONDARY STORAGE DEVICE A MAGTAPE? [Y/N]:

The following instructions and commands are executed if the system has as a secondary storage device a magtape (TU10, TS03, TU16).

```
;
; MOUNT A MAGTAPE IN DRIVE 0
;
* IS THE MAGTAPE IN DRIVE ZERO READY? [Y/N]:
* IS THE MAGTAPE DRIVE A TU16, TU45, or TE16? [Y/N]:
```

The device mnemonic for TU16 or TU45 magtape is MM. The device mnemonic for TU10 and TS03 is MT. This question is used to select the proper sequence of commands.

In the following commands, MT: will be replaced by MM: if you answered Y to this question.

```
LOA MT:
FLX MT:/ZE
FLX MT:/DO=[11,2x]RSXBLD.CMD,RSX11M.OBJ
FLX MT:/DO=[11,2x]RSXBLD.CMD,RSX11S.OBJ
FLX MT:/DO=[11,2x]UDCOM.UDC/FB/RS
FLX MT:/DO=[11,2x]ICTAB.ICR/RS/FB,ICOM.ICR/FB
FLX MT:/DO=[11,2x]DSSDI.IDS/RS/FB,ISCOM.IDS/FB
FLX MT:/DO=[11,10]RSXMC.MAC/RS
```

* IS YOUR SECONDARY STORAGE DEVICE AN RX01 FLEXIBLE DISK? [Y/N]:

The following instructions and commands are executed if the system has as a secondary storage device a floppy disk.

```
LOA DX:
;
; PLACE A BLANK FLEXIBLE DISK IN DRIVE 0
;
* IS THE FLEXIBLE DISK IN DRIVE 0 READY? [Y/N]:
INS [1,5y]INI
INI DX0:SYSGEN
```

SYSGEN DIALOGUE DETAILS

```

REM INI
MOU DX0:SYSGEN
INS [1,5y]UFD
UFD DX0:[1,2x]
REM UFD
PIP DX:=[11,2x]RSXBLD.CMD,RSX11M.OBJ
PIP DX:=[11,2x]RSXBLD.CMD,RSX11S.OBJ
PIP DX:=[11,2x]UDCOM.UDC
PIP DX:=[11,2x]ICTAB.ICR,ICOM.ICR
PIP DX:=[11,2x]DSSDI.IDS,ISCOM.IDS
PIP DX:=[11,10]RSXMC.MAC
DMO DX0:
;

```

If none of the supported configurations is selected, the following text is displayed and the questions are repeated.

```

;
;          ***  E R R O R  ***
; THE CONFIGURATION YOU ARE RUNNING ON IS NOT
; A STANDARD SYSGEN CONFIGURATION. YOU MUST HAVE ONE OF
; THE COMBINATIONS OF DEVICES SPECIFIED ABOVE. WE WILL
; REPEAT THE CONFIGURATION QUESTIONS.
;

```

Normal processing continues here after specific device processing is completed.

```

REM FLX
REM PIP

```

The FLX and PIP tasks are removed; their function has been completed, and they are removed to bring the system back to its initial state.

```

;
; DISMOUNT THE SYSTEM DISK AND MOUNT THE
; UNMAPPED OBJECT DISK
; MAPPED OBJECT DISK
; IN DRIVE 0 AND BOOT IN THE SYSTEM ON THAT DISK
; WHEN THE SYSTEM IS UP, SET THE TIME AND DATE
; AND INITIATE THE INDIRECT COMMAND FILE
; [200,200]SYSGEN2.CMD. FOR EXAMPLE:
; [200,200]11SGEN.CMD. FOR EXAMPLE:
;
; >TIM 10:20 11/15/77
;
; >@SYSGEN2
; >@11SGEN
;
SET /UIC=[200,200]

```

*****DUAL RK05 TRANSFER*****

The indirect command file SGNXFER.CMD transfers control from SYSGEN.CMD to Sysgen2.cmd. This transfer is necessary because the files SYSGEN and SYSGEN2 are on different disks.

The unit that contains the EXEC SRC disk is dismounted. The following assumes that the EXFC SRC disk was mounted in DK1:

```

DM0 DK1:

```

SYSGEN DIALOGUE DETAILS

```
; REMOVE THE EXECSRC DISK FROM DK1:. BEFORE PROCEEDING TO THE NEXT
; PHASE OF SYSGEN, YOU MUST COPY THE SYSTEM DISK. IF YOU HAVEN'T
; DONE SO ALREADY.
```

```
* HAVE YOU MADE A COPY OF THE SYSTEM DISK? [Y/N]:
```

If you haven't made a copy, SGNXFER exits. To continue with SYSGEN, you must manually re-start [200,200] SGNXFER.CMD on the BASLINE disk.

```
; WE WILL EXIT NOW SO YOU CAN COPY THE SYSTEM DISK. TO
; CONTINUE WITH SYSGEN START [200,200]SGNXFER.CMD ON THE
; BASLINE DISK.
```

If you have already copied the SYSTEM disk, SGNXFER continues. The unit that contained the EXECSRC disk is assigned to the pseudo device SY: and the RK05 unit containing the BASLINE disk is assigned to the pseudo device LB:.

```
ASN DK1: = SY:
ASN DKN: = LB:
```

```
----- If you are generating an RSX-11M system, the following
section is omitted.
```

****RSX-11S ONLY****

Note that if you are generating an RSX-11S system and are using the RSX-11M dual RK05 distribution kit, this section is omitted.

```
; PUT THE 11S KIT DISK IN DK1: AND START IT UP (WRITE PROTECTED).
```

```
* IS THE 11S KIT DISK READY? [Y/N]:
```

This question is repeated until the disk is ready (Y response).

```
MOU DK1: 11SKIT
SET /UIC = [2,20]
PIP LB: [2,20] /UF/NV/FO = SY:[2,20]*.*
DMO DK1:
```

****RSX-11M AND RSX-11S****

```
; PUT THE SYSTEM DISK IN DK1: AND START IT UP (WRITE ENABLED).
```

```
* IS THE SYSTEM DISK READY? [Y/N]:
```

This question is repeated until the disk is ready (Y response).

```
MOU DK1:SYSTEM
```

```
; DELETE MAPPED OR UNMAPPED OBJECT LIBRARIES AND BUILD FILES
```

```
SET /UIC=[1,2x]
```

For a mapped system, the unmapped system files are deleted.

```
PIP [1,20]*.*;*/DE
```

SYSGEN DIALOGUE DETAILS

For an unmapped system, the mapped system files are deleted.

```
PIP [1,24]*.*;*/DE
```

```
SET /UIC=[1,5x]
```

```
PIP @LB:[200,200]COPYTSK
```

```
PIP /CO=LB:BADSYS.*,DSCSYS.*,PRESRV.*
```

```
; COPY SYSTEM OBJECT AND BUILD FILES FROM BASLINE DISK
```

```
SET /UIC=[1,2x]
```

The proper object files are then copied. For an RSX-11S system, the PIP command is

```
PIP /NV=LB:RSXBLD.CMD,RSX11S.OBJ
```

For an RSX-11M system, the PIP command is

```
PIP /NV=LB:RSXBLD.CMD,RSX-11M.OBJ
```

If support for ICS/ICR, UDC-11, or DSS-11 was included, the appropriate PIP commands are issued.

For ICS/ICR, the PIP command is

```
PIP /NV=LB:ICTAB.ICR,ICOM.ICR
```

For UDC-11, the PIP command is

```
PIP /NV=LB:UDCOM.UDC
```

For DSS-11, the PIP command is

```
PIP /NV=LB:DSSDI.IDS,ISCOM.IDS
```

```
PIP [200,200]/NV=LB:[200,200]RSXMC.MAC
```

```
* DO YOU WANT TO CONTINUE WITH THE NEXT PHASE OF SYSGEN! [Y/N]:
```

If you do not wish to continue, instructions for doing so are given and SGNXFER exits. Otherwise, SGNXFER continues.

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

The proper file is then invoked; SYSGEN2 for an RSX-11M system and 11SGEN for an RSX-11S system.

End of SYSGEN phase 1.

3.4 SYSGEN2.CMD FILE DETAILS

The user-tailored Executive is built under the direction of the indirect file SYSGEN2.CMD. At the completion of the assembly and configuration phases, directions were given to the single RK05 user to bootstrap from the proper object disk, set the time, and initiate the indirect file SYSGEN2.CMD. The narrative which follows is a display of the SYSGEN2.CMD file. The conventions used in describing the SYSGEN.CMD file apply.

```
;
```


SYSGEN DIALOGUE DETAILS

```
; SYSGEN PART 2      <VERSION 03.1>
;
; COPYRIGHT (C) 1975, 1976, 1977
; DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
```

```
;          BUILD THE EXECUTIVE AND ALL REQUIRED TASKS
;
; EXPANDED COMMENTS PROVIDE A DESCRIPTION OF EVERY STEP IN THIS
; SYSGEN2 COMMAND FILE. ON THE OTHER HAND, SHORT COMMENTS
; PROVIDE VIRTUALLY NO EXPLANATORY TEXT.
;
* DO YOU WANT EXPANDED COMMENTS FOR SYSGEN PART 2? [Y/N]: Y
```

As in SYSGEN Phase 1, expanded comments provide much descriptive text which the experienced user may wish to dispense with.

If you are using the single RK05 distribution kit, you must copy the files from secondary storage to your object disk. The following text and queries are not displayed if you are using other than the single RK05 kit.

SINGLE RK05 KIT ONLY

```
;
; THIS COMMAND FILE WILL PRODUCE THE TARGET SYSTEM ON THE DISK
; PACK CURRENTLY MOUNTED AS SY:. IT WILL REPLACE THE BASE-LINE
; SYSTEM THAT YOU ARE CURRENTLY RUNNING. YOU MUST SAVE
; THIS DISK BEFORE PROCEEDING ANY FURTHER IF YOU HAVEN'T
; DONE SO ALREADY.
;
* DO YOU WANT TO CONTINUE WITH SYSGEN PART 2? [Y/N]:
```

This question allows the user to exit in order to preserve the disk before modifying it in building the target system.

```
; NOW WE COPY THE EXEC BUILD FILE, THE ASSEMBLY PREFIX FILE, THE
; UDC, DRS11/DSS11 OR ICS FILES AND THE CONCATENATED EXECUTIVE OBJECT
; MODULES FROM THE SECONDARY STORAGE MEDIUM TO THE SYSTEM DISK.
; IF DURING SYSGEN PART 1 YOU ANSWERED THAT YOUR SECONDARY
; STORAGE MEDIUM WAS AN RK DISK CARTRIDGE, THESE FILES
; WERE COPIED TO THE SYSTEM DISK AT THAT TIME.
```

```
* ARE THE FILES ALREADY ON THIS DISK? [Y/N]:
```

If they are not, the indirect command file SYSGEN2A is called to copy them. If they are, SYSGEN2A is deleted. The following dialogue actually comes from SYSGEN2A (it appears only if you have not already copied the required files).

Three files, RSXBLD.CMD, RSX11M.OBJ, and RSXMC.MAC must be on the system disk to complete SYSGEN phase 2. In addition, the files for the UDC, DRS/DSS11, or ICR/ICS-11 common blocks must also be on the system disk if user tasks are going to access the device registers. For all kits except the single RK05, these files are already on the disk and need not be copied. For the single RK05 distribution kit, they must be transferred to the system disk. RSXBLD.CMD is the command file that directs the Task Builder in constructing the user-tailored Executive. It was built by the query section. RSX11M.OBJ is the concatenated object module file produced by PIP from the user-tailored Executive object modules during the assembly run following the completion of the dialogue program. RSXMC.MAC is the assembly prefix file produced by the query section. It is

SYSGEN DIALOGUE DETAILS

used to control the assembly of options selected during the running of the query section. They were saved on the backup medium and now must be copied onto the object disk where they will be used to build the user-tailored Executive. For RP or RK06 system disks, this question will not be issued; instead, control will pass immediately to the point where the three files are purged and the Executive library is created (under the leading All Kits).

* IS YOUR SECONDARY STORAGE DEVICE A CASSETTE TAPE? [Y/N]:

If the host system is an RK05-cassette system, the following commands will copy the required files from cassette to the system disk.

;
; MOUNT THE CASSETTE FROM SYSGEN PART 1 IN DRIVE 0

;
* IS THE CASSETTE IN DRIVE 0 READY? [Y/N]:

LOA CT:
INS \$FLX
FLX SY:=CT:RSX11M.OBJ,RSXBLD.CMD
FLX SY:=CT:ICTAB.ICR/FB,ICOM.ICR/FB
FLX SY:=CT:UDCOM.UDC/FB
FLX SY:=CT:ISCOM.IDS/FB,DSSDI.IDS/FB
FLX SY:[200,200]=CT:RSXMC.MAC
UNL CT:

End of RK05-cassette commands. Control passes to the point where the files are purged (under the leading ALL KITS).

* IS YOUR SECONDARY STORAGE DEVICE A DECTAPE? [Y/N]:

If the host system is an RK05-DEctape system, the following commands will copy the specified files from DEctape to the system disk.

;
; MOUNT THE DECTAPE FROM SYSGEN PART 1 IN DRIVE 0

;
* IS THE DECTAPE IN DRIVE 0 READY? [Y/N]:

LOA DT:
INS \$FLX
FLX SY:=DT:RSX11M.OBJ,RSXBLD.CMD
FLX SY:=DT:ICTAB.ICR/FB,ICOM.ICR/FB
FLX SY:=DT:UDCOM.UDC/FB
FLX SY:=DT:ISCOM.IDS/FB,DSSDI.IDS/FB
FLX SY:[200,200]=DT:RSXMC.MAC
UNL DT:

End of RK05-DEctape commands. Control passes to the point where the files are purged (under the leading ALL KITS).

* IS YOUR SECONDARY STORAGE DEVICE A MAGTAPE? [Y/N]:

If the host system is an RK05-magtape system, the following commands will copy the specified files from magtape to the system disk.

;
; MOUNT THE MAGTAPE FROM SYSGEN PART 1 IN DRIVE 0

;
* IS THE MAGTAPE IN DRIVE 0 READY? [Y/N]:

* IS THE MAGTAPE DRIVE A TU16, TE16 OR TU45? [Y/N]:

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If the magtape is a TE16, TU16 or TU45, the following commands are issued:

LOA MM:
INS \$FLX
FLX SY:=MM:RSX11M.OBJ,RSXB LD.CMD
FLX SY:=MM:ICTAB.ICR/FB,ICOM.ICR/FB
FLX SY:=MM:UDCOM.UDC/FB
FLX SY:=MM:ISCOM.IDS/FB,DSSDI.IDS/FB
FLX SY:[200,200]=MM:RSXMC.MAC
UNL MM:

If the magtape is a TE10, TU10 or TS03, the following commands are issued:

LOA MT:
INS \$FLX
FLX SY:=MT:RSX11M.OBJ,RSXB LD.CMD
FLX SY:=MT:ICTAB.ICR/FB,ICOM.ICR/FB
FLX SY:=MT:UDCOM.UDC/FB
FLX SY:=MT:ISCOM.IDS/FB,DSSDI.IDS/FB
FLX SY:[200,200]=MT:RSXMC.MAC
UNL MT:

End of RK05-magtape commands. Control passes to the point where the files are purged (under the leading ALL KITS).

* IS YOUR SECONDARY STORAGE DEVICE AN RX01 FLEXIBLE DISK? [Y/N]:

If the host system is an RK floppy disk system, the following commands will copy the specified files from floppy disk to the system disk.

LOA DX:
;
; MOUNT THE FLEXIBLE DISK FROM SYSGEN PART 1 IN DRIVE 0
;
* IS THE FLEXIBLE DISK IN DRIVE 0 READY? [Y/N]:
MOU DX:SYSGEN
PIP SY:/NV=DX:RSX11M.OBJ,RSXB LD.CMD
PIP SY:/NV=DX:ICTAB.ICR,ICOM.ICR
PIP SY:/NV=DX:UDCOM.UDC
PIP SY:/NV=DX:ISCOM.IDS,DSSDI.IDS
PIP SY:[200,200]/NV=DX:RSXMC.MAC
DMO DX:
UNL DX:

End of RK05-RX01 commands. Control passes to the point where the files are purged (under the heading ALL KITS).

If none of the supported configurations is specified, the following error message is issued and the questions are repeated to determine the secondary storage medium used during SYSGEN phase 1.

;
;
; *** ERROR ***
;
; YOU HAVE NOT CHOSEN ONE OF THE STANDARD SYSGEN SECONDARY
; STORAGE DEVICES. WE WILL REPEAT THE QUESTIONS.
;
* WERE THE FILES COPIED SUCCESSFULLY? [Y/N]:

SYSGEN DIALOGUE DETAILS

If not, you may repeat the questions or pause so that you may copy the files yourself. If successful, SYSGEN2.CMD continues.

****ALL KITS****

Note, if you are using the dual RK05 distribution kit, you must identify the RK05 units that contain the BASLINE and SYSTEM disks. Control passes to this location after the files RSXBLD.CMD, RSX11M.OBJ, RSXMC.MAC and, conditionally, ICTAB.ICR, ICOM.ICR, ISCOM.IDS, DSSDI.IDS, and UDCOM.UDC, are copied to the system disk; or, in the case of RP, RK06, or dual RK05 disk systems, control passes to this location immediately on determining the system type.

* HAVE YOU ALREADY BUILT THE EXEC? [Y/N]:

This question asks whether or not the Executive has been linked together by the Task builder. SYSGEN phase 1 does not link the Executive, it only assembles it. Therefore, the first time you encounter this question, it should be answered negatively.

Typically, before a partition can be laid out, the user needs a Task Builder map of the newly built user-tailored Executive. This occurs later in SYSGEN2.CMD and may require a lengthy off-line analysis of partition layout for the target system. After analyzing the partition layout, SYSGEN2.CMD can be re-initiated. If, at this point, an affirmative answer is typed, the process of building the user-tailored Executive is skipped, and SYSGEN2.CMD advances to the dialogue for the partitioning phase of system generation.

; DELETE ALL BUT THE LATEST VERSIONS OF THE TASK IMAGE
; FILES FOR PIP, EDI, TKB, BIGTKB, VMR, AND BOO.

SET /UIC = [1,5x]
PIP PIP.TSK/PU EDI,TKB,BIGTKB,VMR,BOO

SYSGEN2 may, at a later stage, call SYSGEN3 to build new versions of the task PIP, EDI, TKB, BIGTKB, VMR and BOO. After having done so, SYSGEN2 must be able to install the versions of these tasks which are, at this stage, the latest versions. The PIP command above is executed to make a later identification of those versions possible.

INS \$LBR

If you are using an RL01 or either of the RK05 distribution kits, the file 11SGEN.CMD is deleted.

PIP 11SGEN.CMD;*/DE

If ICS/ICR, DSS, or UDC support was not selected previously, the next question is omitted.

* DO YOU WANT TO BUILD THE UDC, DSS OR ICS/ICR DEVICE COMMON BLOCK? [Y/N]:

; AS DISTRIBUTED ON THE OBJECT DISK, THE SYSTEM OBJECT
; LIBRARY (SYSLIB) DOES NOT CONTAIN THE FORTRAN RUN TIME
; SYSTEM MODULES FOR THE LPS-11 MODULES, THE PURDUE ISA MODULES
; FOR THE UDC, DSS11/DRS11 OR ICS SUBSYSTEMS. THEY MUST BE
; ADDED IF YOU PLAN TO USE THESE ROUTINES IN YOUR TARGET SYSTEM.

SET /UIC = [1,1]

SYSGEN DIALOGUE DETAILS

* DO YOU WISH TO ADD THE UDC/LPS/ICS/DSS ROUTINES TO SYSLIB? [Y/N]: Y

If the answer to this question is N, the next section is bypassed.

* DOES YOUR TARGET SYSTEM HAVE THE UDC-11 SUBSYSTEM? [Y/N]: N

LBR SYSLIB/RP=PURUDC

* DOES YOUR SYSTEM HAVE THE DRS/DSS-11 DIGITAL I/O SUBSYSTEM? [Y/N]: N

* DOES YOUR SYSTEM HAVE THE ICS/ICR-11 SUBSYSTEM? [Y/N]: Y

* DOES YOUR SYSTEM HAVE THE DSR11/DSS11 SUBSYSTEM? [Y/N]: N

LBR SYSLIB/RP = PURICR

* DOES YOUR TARGET SYSTEM HAVE THE LPS-11 OR AR-11 SUBSYSTEMS? [Y/N]: N

LBR SYSLIB/RP = LPS

* DO YOU WANT TO ADD THE PURDUE ISA ROUTINES TO SYSLIB? [Y/N]: Y

The following command is issued only if you wish to add these routines.

LBR SYSLIB/RP = PURISA

The next command is issued only if you are using the RL01 or either of the RK05 distribution kits.

PIP PURISA.OBJ;*/DE,PURUDC;*,PURICR;*,LPS;*,LPA;*

SET /UIC = [1,2X]

REM LBR

;

; DELETE ALL BUT LATEST VERSION OF EXEC BUILD COMMAND FILE,
; ASSEMBLY PREFIX FILE, AND ALL EXEC OBJECT LIBRARIES IF ANY.

;

PIP RSXBLD.CMD/PU

PIP RSX11M.OLB;*/DE

PIP [200,200]RSXMC.MAC/PU

If a previous SYSGEN was not done on this disk, the file RSX11M.OLB will not exist. PIP will issue a warning message to this effect.

;

; NOW WE BUILD THE EXEC LIBRARY

;

Following the assembly of the user-tailored Executive, the individual object modules were concatenated into a single file named RSX11M.OBJ. Concatenation was performed to save space on the secondary medium. This file must be transformed into a library file for processing by the Task Builder (TKB).

INS \$LBR

LBR RSX11M/CR:80.:640.:128.=RSX11M.OBJ

PIP RSX11M.OBJ;*/DE !DELETE OBJECT MODULE FILE

The preceding commands create a library file named RSX11M.OLB from the concatenated object file, and delete the no-longer-needed concatenated object file, thus freeing disk space.

SYSGEN DIALOGUE DETAILS

However, if the distribution kit is other than an RL01 or either of the RK05 kits, the last command above is replaced by the command

```
PIP RSX11M.OBJ/PU      !DELETE ALL BUT LATEST OBJECT MODULE FILE
```

in order to preserve the latest object module file.

```
REM PIP
```

```
* DO YOU WISH TO ADD USER WRITTEN DRIVER(S) TO THE EXEC? [Y/N]:(N)?
```

As part of the SYSGEN process, the user's own specialized drivers can be included in the Executive. An affirmative answer to this question will guide the user in assembling the driver and device table modules, inserting them into the Executive object library, and modifying the Executive build command file to include the driver when the Executive is built. See the RSX-11M Guide to Writing an I/O Driver for additional information on writing drivers and including them in the system.

If the response to the above question is affirmative, the following is displayed.

If you do not wish to add user written drivers to the Executive, the next display appears under the heading ALL SYSTEMS.

USER WRITTEN DRIVERS ONLY

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

```
;  
; WE WILL PAUSE WHILE YOU ASSEMBLE YOUR DRIVER(S) AND USRTB  
; MODULE. THE EXEC ASSEMBLY PREFIX FILE RSXMC.MAC IS ALREADY  
; LOCATED UNDER UFD [200,200]. ASSUMING YOUR DRIVER(S) NAME IS  
; XXDRV, WHERE XX IS THE DEVICE NAME (E.G., DK), THE FOLLOWING  
; COMMANDS WILL ASSEMBLE THE DRIVER(S) AND THE USRTB MODULE.  
;  
; >RUN $MAC  
; >RUN $BIGMAC  
; MAC>XXDRV=[1,1]EXEMC/ML,[200,200]RSXMC,XXDRV  
; MAC>USRTB=[1,1]EXEMC/ML,[200,200]RSXMC,USRTB  
; MAC>^Z  
;
```

At this point, the indirect file will pause while the user assembles the drivers and user device tables.

```
;  
; NOW YOU MUST ADD YOUR DRIVER(S) AND USRTB MODULE  
; TO THE EXEC OBJECT MODULE LIBRARY. THE FOLLOWING IS AN EXAMPLE:
```

```
;  
; LBR>RSX11M/RP=[200,200]XXDRV,USRTB  
; LBR>^Z  
;
```

```
SET /UIC=[1,2x]
```

```
LBR
```

When the Librarian prompts for input, the user should type in a command to include the drivers and device table.

```
REM LBR
```

```
;  
; YOU MUST NOW ADD COMMANDS TO INCLUDE YOUR DRIVER(S) AND USRTB
```

SYSGEN DIALOGUE DETAILS

```
; MODULE INTO THE EXEC BY EDITING THE EXEC TASK BUILD COMMAND FILE.  
; TO ADD DRIVER(S) INSERT COMMANDS OF THE FORM:  
;  
;     RSX11M/LB:XXDRV  
;  
; INTO THE COMMAND FILE IN THE PLACE WHERE THE OTHER DRIVERS ARE  
; REFERENCED. XXDRV REPRESENTS THE NAME OF YOUR DRIVER(S).
```

The next three lines are displayed only if you answered Y to loadable driver support. A loadable driver must not be specified in the TKB Command file to build the executive.

```
; NOTE: FOR THOSE DRIVERS WHICH YOU WANT TO BE LOADABLE,  
; DO NOT INCLUDE CORRESPONDING COMMANDS TO ADD THEM TO  
; THE EXECUTIVE.
```

The next two lines are displayed regardless of whether you specified loadable driver support or not.

```
; THEN LOCATE THE LINE IN WHICH THE MODULE SYSTB IS REFERENCED  
; AND ADD THE ENTRY FOR YOUR USRTB MODULE IMMEDIATELY AFTER IT. EG:
```

```
;     [1,2x]RSX11M/LB:LOADR:NULTK:SYSTB:USRTB:SYTAB:INITL  
;-----  
;
```

```
; FINALLY, LOCATE THE LINE:
```

```
;     GBLDEF=$USRTB:0  
;
```

```
; AND DELETE IT.  
;
```

```
INS $EDI  
EDI RSXBLD.CMD  
REM EDI
```

When the Line Text Editor (EDI) prompts, the user should perform the required edits.

```
; YOUR NON-LOADABLE DRIVERS WILL AUTOMATICALLY BE LINKED  
; WITH THE EXECUTIVE YOU ARE BUILDING.  
;
```

ALL SYSTEMS

Whether or not the user is adding a driver to the Executive, processing continues at this point. The word NON-LOADABLE is omitted if you did not specify loadable driver support.

```
INS $BIGTKB  
INS $TKB
```

Only one of the above commands is issued to install the proper task builder.

```
SET /UIC=[1,2x]  
;  
; NOW WE BUILD THE EXECUTIVE  
;  
TKB @RSXBLD
```

The correct version of the Task Builder is installed and used to build the Executive. The Task Builder (TKB) is controlled by the command file RSXBLD.CMD, which is created during the running of SGN (and possibly modified to include other drivers).

SYSGEN DIALOGUE DETAILS

* DID THE EXECUTIVE BUILD SUCCESSFULLY? [Y/N]:

If the reply indicates that it did not, the following is displayed.

```
;
; WE WILL PAUSE NOW SO THAT YOU CAN CORRECT THE PROBLEM.  AFTER
; RESUMING, WE WILL BUILD THE EXECUTIVE AGAIN.
```

The following text is displayed only when the UDC11, DSS11, or ICS/ICR-11 is being included in the user's target system and the device common block is to be built.

```
;
; NOW WE BUILD THE UDC, DSS OR ICS/ICR DEVICE
; COMMON BLOCKS.  A DEVICE COMMON BLOCK RESIDES
; ON THE I/O PAGE AND IS REFERENCED WHENEVER A TASK
; DIRECTLY ACCESSES ANY I/O MODULES.
```

```
;
TKB @UDCBLD
TKB @ICBLD
```

```
;
; YOU MUST EDIT THE RESIDENT LIBRARY BUILD FILE
; FOR THE DSS11 COMMON BLOCK TO SET THE BASE OF
; THE 32-WORD BOUNDARY AT OR IMMEDIATELY BELOW
; THE FIRST DSS11 BUS ADDRESS SPECIFIED DURING
; SYSGEN PHASE 1.
```

```
;
; EXAMPLE OF EDITING COMMANDS TO SET
; THE BASE ADDRESS OF THE COMMON BLOCK:
```

```
;
; IF THE BASE PHYSICAL BUS ADDRESS OF THE
; DSS11 MODULES IS 160010 AND ONE MODULE
; IS INSTALLED, THE EDITING COMMANDS ARE:
```

```
;
;           *L PAR
;           PAR=ISCOM:XXXXXX:400   ;
;           *R PAR=ISCOM:160000:100
;           *ED
```

```
;
INS $EDI
EDI [1,20]ISBLD.CMD
REM EDI
```

The EDI example and command appear only if you have specified that DSS-11 support is desired, and the target system is unmapped. When EDI prompts, the user should perform the required edits.

```
TKB @ISBLD
```

The TKB command occurs only if DSS-11 support is required.

```
REM TKB
SET /UIC=[1,1]
INS $LBR
```

```
LBR SYSLIB/RP=[1,20]ICOM.ICR
LBR SYSLIB/RP=[1,20]UDCOM.UDC
LBR SYSLIB/RP=[1,20]ISCOM.IDS
LBR SYSLIB/RP=[1,2x]ICTAB.ICR
LBR ISLIB/RP=[1,2x]DSSDI.IDS
LBR SYSLIB/RP=[1,2x]DSSDI.IDS
```


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Of the last two lines, only 1 will actually appear. The first command is executed if you have specified support for DSS-11 and UDC. The second command is executed if you specified support for DSS-11 only, or with ICR/ICS-11.

```
INS $PIP
PIP [1,2x]*.ICR;*/DE
PIP [1,2x]*.UDC;*/DE
PIP [1,2x]*.IDS;*/DE
```

Whether or not the UDC, DSS-11, or ICS/ICR-11 is being included in the target system, processing continues at this point.

```
REM LBR
INS $PIP
UNL LP:
PIP [1,2x]ICBLD.CMD;*/DE,UDCBLD.CMD;*,ISBLD.CMD;*
```

The TKB command files to build the device common blocks are deleted, unless your distribution kit is other than an RL01 or either of the RK05s.

```
;
; YOU NOW NEED THE MAP OF THE EXECUTIVE TO LAYOUT
; THE PARTITIONS IN YOUR NEW SYSTEM.
;
* DO YOU HAVE THE MAP ALREADY? [Y/N]:
LOA LP:
PIP LP:=[1,3x]RSX11M.MAP
UNL LP:
;
```

At this point, the user must find the symbol \$SYTOP in the map. The symbol \$SYTOP provides the value of the highest memory location occupied by the user-tailored Executive and is used for partition layouts. In an unmapped system, tasks are linked to the physical base address of the partition in which they run. To create an unmapped user-tailored system, the task-build command files for FCP, MCR, and TKTN must be edited if \$SYTOP is above 30100(8). If \$SYTOP is above 40000(8), all other task-build command files must be edited, and the associated tasks must be rebuilt. In a mapped system, tasks are linked to a virtual base address rather than a physical base address and, thus, do not depend on the physical base address of the partition.

```
;
; LOOK IN THE MAP OF THE EXEC FOR THE SYMBOL $SYTOP WHICH
; INDICATES THE LAST ADDRESS ALLOCATED TO THE EXEC. USER
; PARTITIONS MAY START AT ANY LOCATION BEYOND THIS ADDRESS
; AS LONG AS THEY FALL ON A 64 BYTE BOUNDARY. SEE THE
; SYSGEN MANUAL FOR A DESCRIPTION OF HOW TO SET UP PARTITIONS.
; YOU MAY WISH TO STOP AT THIS TIME TO LAY OUT YOUR PARTITIONS.
;
* DO YOU WANT TO CONTINUE AND BUILD THE TASKS NOW? [Y/N]: N
```

If the user wishes to consider the partition layout, it is possible, at this point, to interrupt the SYSGEN phase 2 process. See Chapter 4 for information on laying out partitions. At a later time, the user may restart SYSGEN2.CMD and pass control directly to the point where the system tasks are built. If the user specifies an exit from

SYSGEN DIALOGUE DETAILS

SYSGEN phase 2 at this time, the following text is displayed.

```
;
; WE WILL EXIT NOW. WHEN YOU ARE READY TO RESUME
; THE BUILDING OF THE SYSTEM, EXECUTE THIS INDIRECT COMMAND FILE
; AND ANSWER Y TO THE FOLLOWING QUESTION:
;
;     >* HAVE YOU ALREADY BUILT THE EXEC? [Y/N]: Y
;
```

The SYSGEN process will shut down, allowing the user to lay out the partitions. After laying out partitions, the SYSGEN process can be resumed by rebootsrapping the system (if necessary) and starting SYSGEN2.CMD again.

If the user elects to continue with the SYSGEN, processing continues at this point.

```
INS $EDI
INS $PIP
```

```
;
; WE WILL NOW EDIT THE TASK BUILD COMMAND FILES
; AND BUILD THE REQUIRED TASKS.
;
```

If a mapped system is being generated, the following text is displayed.

```
; MOST OF THE TASKS TO BE BUILT HAVE TASK BUILD
; COMMAND FILES WHICH SPECIFY EITHER PARTITION
; SYSPAR OR GEN. SYSPAR IS A PARTITION WHICH IS
; ASSUMED TO BE 10000(8) BYTES LONG
; GEN IS A PARTITION WHICH IS 40000(8) BYTES LONG
```

If an unmapped system is being generated, the following text is displayed.

```
; MOST OF THE TASKS TO BE BUILT HAVE TASK BUILD
; COMMAND FILES WHICH SPECIFY EITHER PARTITION
; SYSPAR OR GEN. SYSPAR IS A PARTITION WHICH IS
; ASSUMED TO BE 7700(8) BYTES LONG
; AND IS ASSUMED TO BE BASED AT 30100(8).
; GEN IS A PARTITION WHICH IS 40000(8) BYTES LONG
; AND IS ASSUMED TO BE BASED AT 40000(8).
;
```

The privileged tasks must always be rebuilt when the Executive has been rebuilt. The privileged tasks are linked to the Executive symbol table file and map into the Executive address space so that they may access various system lists and data structures. If the Executive is changed, these addresses change; thus, the tasks have to be rebuilt.

The Line Text Editor (EDI) may be used to examine the PAR command line in each file that may require modification. Every file in question must be checked, since a Partitions command which does not reflect the requirements of the user-tailored system can produce tasks which will not run. A typical sequence as it would appear on the console is:

```
>EDI BOOBLD.CMD
[PAGE 1]
*L PAR=
```

SYSGEN DIALOGUE DETAILS

```
PAR=GEN:40000:40000
*KILL
EDI>^Z
[EXIT]
```

For an unmapped system, tasks built to run in SYSPAR have the Task Builder command:

```
PAR=SYSPAR:30100:7700
```

Those built to run in the GEN subpartition specify:

```
PAR=GEN:40000:40000
```

For mapped systems, the respective commands are:

```
PAR=SYSPAR:0:10000
PAR=GEN:0:40000
```

If alteration is necessary, the change may be accomplished as shown below. Suppose, for example, the GEN subpartition is to start at 50000(8). The above sequence would be changed to:

```
>EDI BOOBLD.CMD
[PAGE 1]
*L PAR
PAR=GEN:40000:40000
*C/4/5
PAR=GEN:50000:40000
*EX
[EXIT]
```

```
SET /UIC=[1,2x]
```

If loadable driver support has not been included and if you are using an RL01 or either of the RK05 distribution kits, the next command is issued to delete unnecessary files.

```
PIP LOA.OLB;*/DE,LOADBLD.CMD;*,UNLBLD;*
```

If you did not include LPA-11 support and if you are using an RL01 or either of the RK05 distribution kits, the next command is issued to delete the LPA-11 files.

```
PIP LAINIT.OLB;*/DE,[200,200]BLDLAINIT.CMD;*
```

```
;
; IT IS POSSIBLE TO BUILD 3 VERSIONS OF THE FILE SYSTEM:
;   1) 2K NON-MULTI-HEADER
;   2) 2.5K MULTI-HEADER
;   3) 5.5K FAST MULTI-HEADER
; THE NON-MULTI-HEADER FILE SYSTEM RESTRICTS FILES TO A
; MAXIMUM OF 26,112 BLOCKS OF 512 BYTES. THE MULTI-HEADER
; FILE SYSTEMS DO NOT ENFORCE THIS RESTRICTION. IF YOU
; ARE BUILDING A 16K SYSTEM, YOU MUST ALWAYS BUILD THE 2K
; FCP. FOR SYSTEMS WITH RP02/03/04/05/06 DISKS IT IS
; RECOMMENDED THAT YOU BUILD THE 5.5K FCP. BIGFCP IS
; STRUCTURED SO THAT IT STORES AS MANY FILE CONTROL BLOCKS
; (FCBS) IN ITS TASK IMAGE AS POSSIBLE BEFORE OVERFLOWING
; INTO THE DYNAMIC STORAGE REGION. AS DISTRIBUTED, THE
; BUILD COMMAND FILE ALLOCATES SPACE FOR 24. FCB'S. YOU
; MAY CHANGE THIS LIMIT BY EDITING THE BUILD COMMAND FILE.
```

```
* DO YOU WISH TO BUILD THE BIG (5.5K) AND FASTER FILE SYSTEM? [Y/N]: Y
```

SYSGEN DIALOGUE DETAILS

* DO YOU WANT TO BUILD THE 2.5K MULTIHEADER FCP? [Y/N]: N

It is possible to build different file systems: one 2K in size, with file size limited to 26,112 blocks, and relatively heavily overlaid; one 2.5K in size with no file size limit and heavily overlaid; and one a default of 5.5K in size, which is less overlaid, has a file size limited only by the capacity of the disk, and provides faster processing of file access requests. Note that the smallest (2K) file system does not support RMS record locking. (See Chapter 4 for details of the three versions of FCP.) As a result of the answer to these questions, one of the following three questions is asked.

;
; BIGFCP'S BUILD FILE SELECTS PARTITION FCPPAR
; WHICH STARTS AT 100000(8) AND IS
; 26000(8) LONG. IN MOST CASES, THESE LIMITS WILL
; HAVE TO BE ALTERED FOR YOUR SYSTEM.

For a mapped system partition FCPPAR starts at 0(8).

* DO YOU HAVE TO EDIT THE 5.5K FCP TASK BUILD COMMAND FILE? [Y/N]: N

The default partition for the 5.5K FCP is FCPPAR, which is 26000(8) bytes long.

;
; THE 2.5K FCP WILL BUILD TO RUN IN PARTITION
; SYSPAR, WHICH FOR THIS VERSION OF FCP MUST
; BE AT LEAST 10500 OCTAL BYTES BIG.
; IN MOST CASES, YOU HAVE TO EDIT THE BUILD FILE.
;

* DO YOU NEED TO EDIT THE TASK BUILD COMMAND FILE FOR FCP? [Y/N]: N

The default partition for the 2.5K FCP is SYSPAR, which (for this version of FCP) has to be 10500(8) bytes long. For unmapped systems, it starts at 30100(8). You will almost certainly want to change this.

;
; THE 2K FCP WILL BUILD TO RUN IN
; PARTITION SYSPAR AS DEFINED ABOVE.
; YOU MUST EDIT THE BUILD COMMAND
; FILE IF YOU WANT TO CHANGE ITS PARTITION
;

* DO YOU NEED TO EDIT THE TASK BUILD COMMAND FILE FOR FCP? [Y/N]: N

The default partition for the 2K FCP is SYSPAR, which is 7700(8) bytes long. For unmapped systems, it starts at 30100(8).

Depending on the answer to the appropriate preceding question, one of the following three commands may be issued to allow editing of the correct task-build command file.

EDI BIGFCPBLD.CMD
EDI FCPBLD.CMD
EDI FCPNMHBLD.CMD

;
; THE TASKS MCR, MCRMU, AND TKTN NORMALLY RUN
; IN PARTITION SYSPAR. IF YOU WISH TO CHANGE THE PARTITION NAME,
; PUT ANY OF THESE TASKS IN OTHER PARTITIONS,



SYSGEN DIALOGUE DETAILS

SYSPAR
MCRMU
TKTN

For a mapped system

; OR CHANGE THE LENGTH OF SYSPAR FROM 10000(8),

For a unmapped system

; OR CHANGE THE BASE ADDRESS OR LENGTH OF SYSPAR,

For both mapped and unmapped systems

; YOU MUST EDIT THE TASK BUILD COMMAND FILES.

;

; THERE ARE TWO VERSIONS OF MCR AVAILABLE -- A SINGLE USER

; VERSION AND A MULTI-USER VERSION. THE SINGLE USER MCR

; PROCESSES ALL COMMANDS SERIALY AND RUNS IN PARTITION

; SYSPAR. THE MULTI-USER VERSION CONSISTS OF TWO TASKS,

; MCRMU AND SYS. TASK MCRMU RECEIVES ALL COMMANDS IN

; THE NORMAL SERIAL MANNER, BUT IT PASSES MOST ON TO

; TASK SYS FOR PROCESSING. SINCE MULTIPLE COPIES OF

; SYS MAY BE RUNNING (ONE FOR EACH TERMINAL) A DEGREE

; OR PARALLELISM IS ACHIEVED. TASK MCRMU RUNS IN

; PARTITION SYSPAR WHILE TASK SYS RUNS IN GEN.

;

* DO YOU WANT TO BUILD THE MULTI-USER VERSION OF MCR? [Y/N]: Y

If the previous question was answered affirmatively, the following question will be displayed. The EDI command will depend on the answer to the edit question.

NOTE

This sequence of two questions and an EDI command is repeated many times further on in the command file. The operation is always the same; therefore, a description will not be given for each successive one.

* DO YOU HAVE TO EDIT THE TASKBUILD FILE FOR MCRMU AND SYS? [Y/N]: N
EDI MCRMUBLD.CMD

Note that MCRMUBLD.CMD controls the task-build of both MCRMU and SYS.

If you do not want the multi-user version of MCR, the following question is asked:

* DO YOU HAVE TO EDIT THE TASK BUILD FILE FOR MCR? [Y/N]:
EDI MCRBLD.CMD

* DO YOU HAVE TO EDIT THE TASK BUILD COMMAND FILE FOR TKTN? [Y/N]: N
EDI TKNBLD.CMD

The default partition for TKTN is SYSPAR.

If support for ANSI format magtape was not selected during SYSGEN phase 1, the next section is bypassed.

; THE TASK MTAACP IS THE ANSI MAGTAPE FILE SYSTEM
; AND MUST BE BUILT IF YOU WISH SUPPORT FOR ANSI FORMAT
; MAGTAPE. THE TASK MTAACP WILL BUILD TO
; RUN IN PAR4K WHICH IS BASED AT
; 130000(8) AND REQUIRES ONLY 13000(8) BYTES.

SYSGEN DIALOGUE DETAILS

; THE TASK FLLMSG IS THE MAGTAPE MESSAGE TASK, AND
; ISSUES MESSAGES FROM THE MAGTAPE ACP. IT WILL BUILD
; TO RUN IN SYSGEN AS DESCRIBED ABOVE.
;

If the target system is mapped, MTAACP will build to run in partition GEN, which is based at 0(8) and requires only 13000(8) bytes.

* DO YOU HAVE TO EDIT THE TASK BUILD COMMAND FILE FOR MTAACP? [Y/N]: Y
EDI MTABLD.CMD
* DO YOU HAVE TO EDIT THE TASK BUILD COMMAND FILE FOR FLLMSG? [Y/N]: N
EDI FLLMSGBLD.CMD

PAR416 4K part

Processing continues here whether ANSI magtape support was selected or not.

; THE FOLLOWING TASKS PROCESS ADDITIONAL MCR COMMANDS:
; BOO, DMO, AT., INI, INS, LOA, MOU, SAV, UFD, AND UNL.
; THEIR TASK BUILD COMMAND FILES SPECIFY PARTITION GEN, WHICH IS
; 8K WORDS (OCTAL 40000 BYTES) LONG. IF YOU WISH TO CHANGE THE
; PARTITION IN WHICH ANY OF THEM RUN, YOU MUST EDIT THE
; APPROPRIATE BUILD FILE.
; IN ADDITION, FOR UNMAPPED SYSTEMS PARTITION GEN
; IS ASSUMED TO START AT 40000. IF IN YOUR TARGET
; SYSTEM GEN'S BASE ADDRESS HAS CHANGED, YOU MUST
; EDIT THE BUILD COMMAND FILES FOR ALL OF THESE TASKS.
; IF THE ALTER-PRIORITY DIRECTIVE WAS NOT INCLUDED IN THE
; EXECUTIVE, YOU MUST EDIT THE COMMAND FILE FOR TASK AT.

* DO YOU HAVE TO EDIT ANY FILES FOR MCR TASKS? [Y/N]: N

If the previous question is answered affirmatively, the following questions are displayed; depending on the user's response, the EDI command may or may not be issued.

* DO YOU WANT TO EDIT TASK BOO'S BUILD COMMAND FILE? [Y/N]:
EDI BOOBLD.CMD
* DO YOU WANT TO EDIT TASK DMO'S BUILD COMMAND FILE? [Y/N]:
EDI DMOBLD.CMD
* DO YOU WANT TO EDIT TASK AT.'S BUILD COMMAND FILE? [Y/N]:
EDI INDBLD.CMD
* DO YOU WANT TO EDIT TASK INI'S BUILD COMMAND FILE? [Y/N]:
EDI INIBLD.CMD
* DO YOU WANT TO EDIT TASK INS'S BUILD COMMAND FILE? [Y/N]:
EDI INSBLD.CMD
* DO YOU WANT TO EDIT TASK MOU'S BUILD COMMAND FILE? [Y/N]:
EDI MOUBLD.CMD
* DO YOU WANT TO EDIT TASK SAV'S BUILD COMMAND FILE? [Y/N]:
EDI SAVBLD.CMD
* DO YOU WANT TO EDIT TASK UFD'S BUILD COMMAND FILE? [Y/N]:
EDI UFDLBD.CMD

The next two questions are displayed only if you selected support for loadable drivers.

* DO YOU HAVE TO EDIT TASK LOA'S BUILD COMMAND FILE? [Y/N]: N
EDI LOABLD.CMD
* DO YOU HAVE TO EDIT TASK UNL'S BUILD COMMAND FILE? [Y/N]: N
EDI UNLBDL.CMD

The following text is always displayed.

SYSGEN DIALOGUE DETAILS

; THE TASKS HELLO AND BYE PROVIDE LOGIN/LOGOUT SUPPORT FOR
; MULTI-USER SYSTEMS. IF YOU SELECTED MULTI-USER PROTECTION
; SUPPORT DURING SYSGEN PART1, YOU MUST BUILD HELLO AND BYE.
; THE ACCOUNT FILE MAINTENANCE PROGRAM ACNT MUST ALSO BE
; BUILT TO CREATE AND MAINTAIN THE PASSWORD FILE. IN
; ADDITION, TWO OPTIONAL TASKS ARE AVAILABLE:
; BRO - BROADCAST MESSAGE TO TERMINALS
; SHUTUP - PERFORM ORDERLY SYSTEM SHUTDOWN.
; ALL OF THE DISTRIBUTED COMMAND FILES SPECIFY THAT THE
; TASKS RUN IS PARTITION GEN.

* DO YOU WANT TO BUILD THE MULTI-USER PROTECTION TASKS? [Y/N]: Y
* DO YOU WANT TO BUILD THE MULTI-USER UTILITIES? [Y/N]: Y
* DO YOU WANT TO EDIT THE BUILD FILES FOR HELLO, BYE, AND ACNT? [Y/N]: Y

If you do not wish to build the multiuser protection tasks
and are using an RL01 or either of the RK05 distribution
kits a PIP command is issued to delete the unused files.

PIP MLTUSR.OLB;* ,ACNTBLD.*;* ,BYEBLD.*;* ,HELBLD.*;* /DE

Similar commands are issued to delete other unused files.
For brevity, these are omitted.

; IF YOUR TARGET SYSTEM DOES NOT HAVE A LINE PRINTER, YOU MUST
; EDIT THE BUILD FILE FOR ACNT TO REMOVE THE ASSIGNMENT TO LP:.

* DO YOU HAVE TO EDIT THE BUILD FILES FOR HELLO, BYE, AND ACNT? [Y/N]: N

EDI ACNTBLD.CMD
EDI BYEBLD.CMD
EDI HELBLD.CMD

* DO YOU HAVE TO EDIT THE BUILD FILES FOR BRO AND SHUTUP? [Y/N]: N
EDI BROBLD.CMD
EDI SHUTUPBLD.CMD

If you want to build any of the multi-user protection tasks,
you must edit the appropriate task-build command file under
one of the following conditions: the target system is
unmapped and the GEN partition is not at 40000, or you want
to change the partition.

; THE TASKS ERL AND ERF SUPPORT ERROR LOGGING. ERL IS THE
; ERROR LOGGER TASK, ERF TURNS ERROR LOGGING OFF. THEY MUST
; BE BUILT IF YOU SELECTED ERROR LOGGING SUPPORT DURING SYSGEN
; PART ONE. THE TASK BUILD COMMAND FILES BUILD BOTH TASKS TO
; RUN IN PARTITION GEN.

;
* DO YOU WANT TO BUILD THE ERROR LOGGING TASKS? [Y/N]: Y
* DO YOU HAVE TO EDIT THE BUILD FILES FOR ERL AND ERF? [Y/N]: Y

The remaining error logging tasks (PSE and SYE) are not
privileged and, therefore, are not built during SYSGEN phase
2. If you want to build the tasks PSE and SYE, you must do
so at a later time (initiate SYSGEN phase 3 at the
appropriate time).

EDI ERFBLD.CMD
EDI ERLBLD.CMD

; THE TASK ACS ALLOCATES/DEALLOCATES THE CHECKPOINT FILE
; IF YOU SELECTED SUPPORT FOR DYNAMIC ALLOCATION OF
; CHECKPOINT SPACE DURING SYSGEN PART 1, YOU MUST BUILD
; THIS TASK. IT WILL BUILD TO RUN IN PARTITION GEN.
;

SYSGEN DIALOGUE DETAILS

* DO YOU WANT TO BUILD TASKS ACS? [Y/N]: **Y**
 * DO YOU HAVE TO EDIT TASK ACS'S BUILD COMMAND FILE? [Y/N]: **N**
 EDI ACSBLD.CMD

Again, edit task-build command files for tasks you want to build, if the GEN partititon start address has changed, or you want to change the partition.

```

;
; TASK PMD IS THE POST-MORTEM AND SNAP DUMP PROCESSOR.
; IT IS A PRIVILEGED TASK AND FOR CORRECT OPERATION IT SHOULD
; RUN IN A PARTITION WITH ONLY CHECKPOINTABLE TASKS.
; THE TASK BUILD COMMAND FILE BUILDS THE TASK FOR PARTITION
; PAR4K WHICH IS 20000(8) LONG
; AND IS ASSUMED TO START AT 130000(8). (Only displayed for unmapped
; systems)
    
```

* DO YOU WANT TO BUILD TASK PMD? [Y/N]: **Y**
 * DO YOU HAVE TO EDIT PMD'S BUILD COMMAND FILE? [Y/N]: **N**
 EDI PMDBLD.CMD

The task SHF..., referred to below, may only run in a mapped system. Therefore, the text associated with it will only be displayed during the building of mapped systems.

```

;
; TASK SHF IS THE SYSTEM CONTROLLED PARTITION TASK
; COMPACTION ROUTINE. IT WILL AGGLOMERATE FREE SPACE
; IN A SYSTEM CONTROLLED PARTITION ON REQUEST FROM
; THE EXECUTIVE. YOU MUST HAVE SELECTED DYN. MEM. ALLOC.
; DURING SYSGEN PART 1 FOR THIS TASK TO BE CALLED BY
; THE EXECUTIVE. IT NORMALLY RUNS IN PARTITION SYSPAR.
; THE PARTITION IT RUNS IN MUST NOT BE SYSTEM CONTROLLED.
* DO YOU WANT TO BUILD TASK SHF? [Y/N]: Y
* DO YOU HAVE TO EDIT TASK SHF'S BUILD COMMAND FILE? [Y/N]: N
EDI SHFBLD.CMD
    
```

```

;
; THE TASK RMDemo DISPLAYS SYSTEM STATUS ON A VT05 OR VT52.
; IT DISPLAYS THE ACTIVE TASK, POOL STATUS, PARTITION
; LAYOUT, AND TASKS RESIDENT IN MEMORY. IT WILL BUILD
; FOR PARTITION GEN BUT ONLY REQUIRES 4K TO RUN AND
; USES LUN1 AS THE DISPLAY DEVICE.
;
* DO YOU WANT TO BUILD TASK RMDemo? [Y/N]: Y
* DO YOU WANT TO BUILD IT FOR A VT05? [Y/N]: N
* DO YOU WANT TO BUILD IT FOR A VT52? [Y/N]: Y
* DO YOU HAVE TO EDIT TASK RMDemo'S BUILD COMMAND FILE? [Y/N]: N
EDI RMD05BLD.CMD
EDI RMD52BLD.CMD
    
```

```

;
; THE PRINT SPOOLER IS NOT DISTRIBUTED AS A TASK IMAGE. IF YOU
; WISH TO USE A PRINT SPOOLER IN YOUR TARGET SYSTEM, YOU MUST
; EXPLICITLY BUILD IT. THE TASK BUILD COMMAND FILE
; SPECIFIES PARTITION SPLPAR WHICH IS 10000(8) LONG
; AND IS ASSUMED TO START AT 130000(8).
    
```

The last line of the text above appears only if you are generating an unmapped system.

If you wish to build the print spooler, you must answer affirmatively to the next question.

* DO YOU WANT TO BUILD TASK PRT (PRINT SPOOLER)? [Y/N]: **Y**

SYSGEN DIALOGUE DETAILS

The command file specifies that PRT be a checkpointable task; its performance can be improved by making it non-checkpointable. The command file also builds PRT to delete all spooled files after printing; this attribute can be altered. If either of these changes to PRT is desired, answer Y to the following question.

```
; THE DEFAULT PRINT SPOOLER WILL ONLY DELETE FILES NAMED  
; LP.LST, LP.MAP, *.PMD, AND *.DMP. IF YOU WANT THE SPOOLER  
; TO DELETE ALL FILES, YOU MUST EDIT THE BUILD COMMAND FILE.
```

The criteria for user-selectable file deletion in PRT is discussed in Chapter 4.

```
* DO YOU WANT TO EDIT TASK PRT'S BUILD COMMAND FILE? [Y/N]: Y p.4-19  
EDI PRIBLD.CMD  
;  
; NOW WE BUILD THE PRIVILEGED AND MCR TASKS.  
;  
INS $TKB  
INS $BIGTKB  
INS $PIP  
SET /UIC=[1,2x]  
PIP *.CMD/PU
```

The SYSGEN procedure selects the proper version of the Task Builder, if the Task Builder is not already installed. This could be the case if SYSGEN2.CMD was terminated after building the Executive. The PIP command deletes all but the latest versions of the command files.

```
* DO YOU WANT TO GENERATE THE MAPS FOR THE ABOVE TASKS? [Y/N]: N
```

In most cases, these maps are of little use to the user and are not needed. Therefore, a negative response is usually given.

If, however, the maps are desired, the following is displayed.

```
; FOR THE SINGLE RK05, DUAL RK05 OR RL01 DISTRIBUTION KITS, RUNNING  
; STANDALONE, YOU MAY DIRECT THE TASK BUILDER MAPS TO THE LINE  
; PRINTER, OR ANOTHER DISK OF THE SAME TYPE AS YOUR KIT. NOTE THAT  
; THE MAPS WILL NOT FIT ON THE DISTRIBUTION DISKS FOR THE ABOVE.  
;  
; FOR OTHER DISTRIBUTION KITS, YOU MAY SPECIFY THE LINE PRINTER,  
; THE DISTRIBUTION KIT DISK (SY0) OR A SECOND DISK OF THE SAME TYPE.  
;  
; FOR ALL ONLINE SYSGENS, YOU MAY SPECIFY ANY DISK WITH AT LEAST  
; 1400 FREE BLOCKS NOTE THAT SYSGEN WILL NOT LOAD THE DRIVER FOR  
; THIS DISK.
```

```
* WHAT IS TO BE THE MAP DEVICE? [DDU] [S]:
```

The response is then assigned to the logical device MP:. The following assumes DK1: is to be the map device.

```
ASN DK1:=MP:
```

If you do not wish to print the maps, they are assigned the null device.

```
ASN NL:=MP:
```

SYSGEN DIALOGUE DETAILS

TKB @BOOBLD
PIP BOO.OLB;*/DE, BOOBLD.CMD;*/DE

The previous two commands build the task and delete the unused files. The unused files are deleted only if you are using an RL01 distribution kit or either of the RK05 distribution kits. Similar commands will now be issued for all tasks that were selected to be built in the preceding sections.

TKB @DMOBLD
PIP DMOBLD.CMD;*/DE

TKB @FCPBLD
TKB @FCPNMHBLD
TKB @BIGFCPBLD

The selected version of the file control primitives is built.

PIP FCP.OLB;*,FCPBLD.CMD;*,BIGFCPBLD.*;*/DE
TKB @INDBLD
PIP IND.OLB,INDBLD.*;*/DE
TKB @INIBLD
PIP INIBLD.*;*/DE
TKB @INSBLD
PIP INS.OLD;*,INSBLD.*;*/DE
TKB @MCRBLD
TKB @MCRMUBLD
PIP MCRBLD.*;*/DE
PIP MCRMUBLD.*;*,SYSBLD.*;*/DE
TKB @MOUBLD
PIP MOU.OLB;*,INI.OLB;*,MOUBLD.*;*/DE

If ANSI magtape support was selected, the next two commands are issued.

TKB @FllMSGBLD
PIP FllMSG.OLB;*,FllMSGBLD.OLD;*,.CMD;*/DE
TKB @MTABLD
PIP MTA.OLB;*,MTABLD.*;*/DE
TKB @SAVBLD
PIP SAV.OLB;*,SAVBLD.*;*/DE
TKB @TKNBLD
PIP TKNBLD.CMD;*/DE
TKB @UFDBLD
PIP UFD.OLB;*,UFDBLD.CMD;*/DE

The next two commands are issued only if loadable device driver support was selected.

TKB @LOABLD
TKB @UNLBLD
PIP LOABLD.CMD;*,UNLBLD;*,LOA.OLB;*/DE

The next command is issued only if the Post-mortem and Snap Shot Dump task was selected to be built.

TKB @PMDBLD
PIP PMD.OLB;*,PMDBLD.*;*/DE

One of the next two commands is issued only if the system status display task RMDEMO was selected to be built.

SYSGEN DIALOGUE DETAILS

TKB @RMD05BLD
TKB @RMD52BLD
PIP RMD05.OBJ;* ,RMD05BLD.CMD;*/DE
PIP RMD52.OBJ;* ,RMD52BLD.CMD;*/DE

The next command is issued only when the memory compaction routine was selected to be built.

TKB @SHFBLD
PIP SHUFL.OBJ;* ,SHFBLD.CMD;*/DE

The next 2 commands are issued only if the print spooler was selected to be built.

TKB @PRTBLD
PIP PRT.OLB;* ,PRTBLD.ODL;* ,PRTBLD.CMD;*/DE

The next set of commands are issued only if the multi-user protection tasks were selected to be built.

TKB @ACNTBLD
PIP ACNTBLD.*;*/DE
TKB @BYEBLD
PIP BYEBLD.CMD;*/DE
TKB @HELBLD
PIP HELBLD.CMD;*/DE

The next set of commands are issued only if the multi-user utility tasks were selected to be built.

TKB @BROBLD
PIP BROBLD.CMD;*/DE
TKB @SHUTUPBLD
PIP MLTUSR.OLB;*/DE

The next command is issued only if the checkpoint space allocation task was selected to be built.

TKB @ACSBLD
PIP ACSBLD.CMD;*/DE
PIP MCR.OLB;*/DE ,SYSROT.OBJ;*

The next 3 commands are issued only if the error logging tasks were selected to be built.

TKB @ERFBLD.CMD
TKB @ERLBLD.CMD
PIP ERF.OBJ;*/DE ,ERL.OLB;*

The following is displayed only if LPA-11 support was included.

If you have not included LPA-11 support, the next queries appear under the heading ALL SYSTEMS.

LPA-11 SUPPORT ONLY

* DO YOU WANT THE MAPS FOR THE MICRO CODE LOADER TASKS? [Y/N]:

The proper version of the task builder is then installed.

INS \$TKB
INS \$BIGTKB
SET /UIC=[1,2x]

SYSGEN DIALOGUE DETAILS

```

;
; THE LPA-11 MAY BE LOADED WITH ONE OF THREE VERSIONS
; OF THE MICRO CODE:
;
; 0      MULTI-REQUEST MODE
; 1      DEDICATED MODE A/D INPUT
; 2      DEDICATED MODE D/A OUTPUT
;

```

* ENTER MICRO CODE VERSION DESIRED FOR LPA-11 #N[0 R:0-2 D:1]:

Note that N above is replaced by the unit being referenced (for example, the first time the question is asked, N is replaced by 0 and so on).

* IS THE LAB I/O ON THIS LPA-11 AN AR11? [Y/N]:

The above two queries are repeated for each LPA-11 unit specified.

* DO YOU WANT TO EDIT THE LOADER TASK BUILD COMMAND FILES? [Y/N]:

Editing the command file is necessary if you wish to change the partition name or, on an unmapped system, the partition base. The indirect command file [200,200]BLDLAINIT.COMD contains further details.

If you want to edit the command files, EDI is installed to allow you to do so.

```

INS $EDI
EDI LAINIXBLD.COMD
EDI LAINITBLD.COMD
REM EDI

```

The proper task builder commands are then issued.

```

TKB @LAINIXBLD
TKB @LAINITBLD

```

PIP is then installed to delete the LPA-11 files.

```

INS $PIP
PIP LAINIXBLD.COMD;*/DE,LAINITBLD;*

```

```

REM PIP
REM TKB

```

```

;
; IN ORDER FOR THE LPA-11 MICRO CODE LOADER TO FUNCTION PROPERLY,
; ON POWERFAIL RECOVERY OR DRIVER LOAD YOU MUST HAVE THE
; FOLLOWING TASKS INSTALLED:
;

```

```

;      LAINIT - THE MICRO CODE LOADER
;      LAIN0  - LOADER REQUESTOR FOR LPA-11 UNIT 0
;      LAIN1  - LOADER REQUESTOR FOR LPA-11 UNIT 1
;      .
;      .
;      LAIN17 - LOADER REQUESTOR FOR LPA-11 UNIT 17(8)
;

```

```

; SYSGEN2, WHEN IT CREATES INSTALL.COMD, ONLY INSTALLS LAINIT AND
; LAIN0. YOU MUST EDIT INSTALL.COMD TO INCLUDE THE OTHER REQUESTOR
; TASKS. IF THE REQUIRED TASKS ARE NOT INSTALLED, THE
; LPA-11 MICROCODE WILL NOT BE LOADED AUTOMATICALLY.

```

ALL SYSTEMS

SYSGEN DIALOGUE DETAILS

PIP [200,200]BLDLAINIT.CMD;*/DE,LAINIT.OLB;*

At this point, all tasks have been built. If the host system is running on an RK05 disk, all object module libraries, task-build command files, and overlay description files are deleted, except for the Executive object library and task-build command file.

PIP [200,200]/RE=RSXBLD.CMD,RSX11M.OLB
PIP *.*;*/DE
PIP [1,2x]/RE=[200,200]RSXBLD.CMD,RSX11M.OLB

If maps were printed on the line printer, the next command unloads the LP driver.

UNL LP:

The next question is displayed only if loadable device driver support was selected.

* DO YOU WANT TO BUILD ANY LOADABLE DRIVERS NOW? [Y/N]: Y

If the answer is Y, the following questions and commands from the file BLDDRV.CMD are issued.

If loadable drivers were not selected or if you do not wish to build them, the next display appears under the heading ALL SYSTEMS.

BUILDING LOADABLE DRIVERS ONLY

SET /UIC=[200,200]

;
; YOU MAY NEED THE TASK BUILD MAPS FOR THE DRIVER(S) FOR
; YOUR PARTITION LAYOUT.
;
* DO YOU WANT THE MAPS? [Y/N]: Y

If the answer to this question is N, no maps will be generated for the loadable drivers. Otherwise, the maps will be output on the line printer if the system has one, or on the console terminal. One of the following three messages is displayed.

;
; THE MAPS WILL BE SPOOLED TO THE LINEPRINTER
; THE MAPS WILL BE PRINTED ON THE LINEPRINTER
; THE MAPS WILL BE PRINTED ON THE CONSOLE TERMINAL

If maps are directed to the line printer, the next command is issued to load the LP driver.

LOA LP:
SET /UIC=[1,2x]

;
; WHEN ALL DRIVERS ARE BUILT, STRIKE CARRIAGE RETURN WHEN ASKED
; FOR DEVICE MNEMONIC.
;
* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC? [S]:

CR
MM
LP
PR
PP
OLIVE ?

GK
VT
RE
PE

SYSGEN DIALOGUE DETAILS

The answer should be the 2-character device mnemonic for the (next) loadable driver to build; e.g., MT, followed by carriage return. If a single carriage return is answered, the driver build section is terminated.

* WHAT IS THE DRIVER PARTITION NAME? [S]:

The answer should be a 1- to 6-character partition name where the driver is intended to run.

* WHAT IS ITS PARTITION BASE ADDRESS? [S]:

This question is displayed only if an unmapped system is being generated. The answer should be the base address (octal bytes) for the driver partition.

TKB @[200,200]XXDRVBLD

This command builds the specified driver for the specified partition. XX is the driver mnemonic entered in response to a previous question.

PIP [200,200]XXDRVBLD.CMD;*/DE

The command above deletes the command file that was used to build the driver.

Processing now resumes with the DEVICE MNEMONIC question, and the previous sequence is repeated to build the next driver.

If no more drivers are selected to be built, the driver build section terminates. If maps were directed to the line printer, the following command unloads the LP driver.

ALL SYSTEMS

Whether or not loadable drivers were built, BLDDRV.CMD exits and processing will resume here in SYSGEN2.CMD.

INS \$PIP

If a new line printer driver was built, the following is performed before the line printer is unloaded. Otherwise, it is omitted.

```
; BECAUSE UNLOAD WILL BE CONFUSED BY THE NEW LP DRIVER,  
; WE WILL RENAME IT. BEFORE WE RUN VMR, WE WILL CHANGE  
; IT BACK.
```

```
SET /UIC=[1,5x]  
PIP LPNEW.TSK/NV/RE=LPDRV.TSK  
PIP LPNEW.STB/NV/RE=LPDRV.STB
```

Whether or not a new driver was built, the line printer is unloaded.

```
UNL LP:  
REM TKB
```

If support for ANSI magtape was not selected, the next section is bypassed.

```
SET /UIC=[1,1]  
INS $LBR
```

SYSGEN DIALOGUE DETAILS

If the system disk is an RK05 or RL01, the FCS routines that handle ANSI magtape will now be inserted in SYSLIB.

; AS DISTRIBUTED, SYSLIB DOES NOT CONTAIN THE FILE CONTROL SERVICES SUBROUTINES FOR ANSI MAGTAPE SUPPORT. WE WILL NOW INSERT THEM INTO SYSLIB.

; NOTE: THESE ROUTINES CAUSE AN INCREASE IN THE SIZE OF MOST TASKS BUILT WITH THEM AS COMPARED TO THE NON-ANSI VERSION OF FCS.

* DO YOU WANT ANSI MAGTAPE SUPPORT IN SYSLIB? [Y/N]: Y

LBR SYSLIB/RP=FCSMTA
PIP FCSMTA.OBJ;*/DE

On the other hand, if the system disk is an RP or RK06 disk, an alternative version of SYSLIB will be created, called ANSLIB.

; AS DISTRIBUTED, SYSLIB DOES NOT CONTAIN THE FILE CONTROL SERVICES SUBROUTINES FOR ANSI MAGTAPE SUPPORT. WE WILL NOW CREATE AN ALTERNATIVE VERSION OF SYSLIB, WITH THE FILE NAME "[1,1]ANSLIB", THAT CONTAINS THE ANSI SUPPORT ROUTINES. THIS LIBRARY SHOULD BE INCLUDED AS INPUT TO THE TASK BUILDER WHENEVER YOU BUILD A TASK THAT REQUIRES ANSI SUPPORT.

; NOTE: THESE ROUTINES CAUSE AN INCREASE IN THE SIZE OF MOST TASKS BUILT WITH THEM AS COMPARED TO THE NON-ANSI VERSION OF FCS.

* HAS ANSLIB ALREADY BEEN CREATED BY A PREVIOUS SYSGEN? [Y/N]: N

The following three commands are issued if this question was answered with an N.

PIP ANSLIB.OLB;*/DE
PIP ANSLIB.OLB/CO=SYSLIB.OLB
LBR ANSLIB/RP=FCSMTA

For all systems with ANSI magtape support, the next command is issued.

REM LBR

Whether ANSI magtape support was selected or not, processing continues here.

; THE UTILITY TASKS (MAC, PIP, TKB ETC.) ARE ALREADY BUILT TO RUN IN PARTITION GEN (EXCEPT BIGMAC AND BIGTKB WHICH ARE BUILT TO RUN IN PAR14K). IF YOU WISH TO CHANGE THE PARTITION IN WHICH ANY OF THEM RUN YOU MUST EDIT THE APPROPRIATE TASK'S BUILD COMMAND FILE AND REBUILD THE TASK.

The following note appears only when building mapped systems.

; NOTE: FOR MAPPED SYSTEMS IT ISN'T NECESSARY TO REBUILD ANY OF THESE TASKS SINCE YOU MAY EXPLICITLY SPECIFY THE PARTITION IN WHICH THEY RUN AT INSTALL TIME.

all to GEN

SYSGEN DIALOGUE DETAILS

```
;  
; SINCE YOU HAVE SELECTED SUPPORT FOR ANSI MAGTAPE,  
; YOU WILL PROBABLY WANT TO REBUILD PIP AND POSSIBLY  
; OTHER UTILITY TASKS TO BE ABLE TO HANDLE ANSI MAGTAPES.  
;  
; THE USER MODE DIAGNOSTICS ARE NOT DISTRIBUTED AS TASK IMAGES.  
; IF YOU WANT THEM, YOU HAVE TO BUILD THEM.  
;
```

If you are using an RL01 or either of the RK05 distribution kits, there is not enough disk space to rebuild any utility tasks or user mode diagnostics.

The following is displayed if you are using the dual RK05 distribution kit.

```
;  
; IF YOU WANT TO REBUILD THE UTILITY OR DIAGNOSTIC TASKS  
; AND THE SYSTEM YOU ARE GENERATING HAS AT LEAST 24K OF  
; MEMORY AND IT WILL RUN THE DISTRIBUTED TASKS, IT IS  
; SUGGESTED THAT YOU REBUILD THEM USING YOUR SYSTEM DISK  
; INSTEAD OF THE BASLINE DISK, AFTER SYSGEN2 IS COMPLETED.  
; OTHERWISE, ANSWER YES TO THE FOLLOWING QUESTION.
```

The following is displayed if you are using an RL01 or single RK05 distribution kit.

```
;  
; IF YOU WISH TO REBUILD THE UTILITY TASKS AND/OR BUILD THE USER MODE  
; DIAGNOSTICS, YOU MUST DO SO AFTER SYSGEN PART 2 HAS BEEN COMPLETED.  
; AT THAT TIME, MOUNT THE DISK LABELED "UTILITY OBJECTS" AND  
; RUN THE INDIRECT COMMAND FILE [200,200]SYSGEN3.CMD  
;
```

If you are using a distribution kit other than an RL01 or a single RK05, the following question is asked:

* DO YOU WANT TO REBUILD UTILITIES AND/OR BUILD DIAGNOSTICS? [Y/N]: Y ?

If you answer Y, the command file SYSGEN3.CMD (described in Section 3.5) is automatically called. However, if you are using the dual RK05 distribution kit, the indirect command file SGNXFER2.CMD is used to transfer control. The following text, which actually comes from the file SGNXFER2.CMD, is displayed for dual RK05 SYSGENS.

DUAL RK05 KIT

The following assumes that the SYSTEM disk was mounted in DK1:.

DMO DK1:

```
; REMOVE THE SYSTEM DISK FROM DK1: AND REPLACE IT WITH  
; THE UTILOBJ DISK. START UP THE UTILOBJ DISK (WRITE  
; ENABLED).
```

* IS THE UTILOBJ DISK READY? [Y/N]:

The query is repeated until the disk is ready (Y response). The disk is then mounted and control passed to SYSGEN3.CMD (see Section 3.5).

MOU DK1:UTILOBJ2

SYSGEN DIALOGUE DETAILS

When SYSGEN3.CMD is completed, SGNXFER2.CMD continues.

DMO DK1:

```
; REMOVE THE UTILOBJ DISK FROM DK1: AND REPLACE IT  
; WITH THE SYSTEM DISK.
```

* IS THE SYSTEM DISK READY? [Y/N]:

The query is repeated until the disk is ready (Y response).
The disk is then mounted and the new tasks are copied to the
system disk.

MOU DK1:SYSTEM

```
; WE WILL NOT COPY THE NEW TASKS TO THE SYSTEM DISK.  
; PIP IS THEN INSTALLED AND THE TASKS COPIED.
```

ALL KITS

Processing of SYSGEN2.CMD continues here.

```
SET /UIC=[1,5y]  
INS $PIP;-1
```

The following text and questions appear only when building
mapped target systems.

If you are building an unmapped system, the next display
appears under the heading ALL SYSTEMS.

MAPPED SYSTEMS ONLY

```
;  
; YOU NOW MUST SPECIFY WHETHER THE MEMORY SIZE WHICH YOU  
; SPECIFIED FOR YOUR TARGET SYSTEM IN SGN DURING SYSGEN  
; PHASE ONE IS GREATER THAN 32K WORDS  
;  
* IS YOUR TARGET SYSTEM LARGER THAN 32K WORDS? [Y/N]: Y
```

If the answer to this question is affirmative, the following
text is displayed.

If you respond negatively, the next display appears under
the heading ALL SYSTEMS.

```
;  
; IF YOU EVER WISH TO FIX TASKS ABOVE 32K OR LOAD DRIVERS  
; ABOVE 32K AND SAVE THE SYSTEM OR IF THE TASK SAV  
; (WHICH NORMALLY RUNS IN GEN) IS EVER TO BE RUN ABOVE  
; 32K, YOU MUST CREATE A LARGER COPY OF YOUR TARGET SYSTEM  
; WITH PIP AT THIS TIME.
```

```
;  
; NOTE: IT IS NOT POSSIBLE TO BOOT A VIRGIN MAPPED  
; SYSTEM WHICH HAS DRIVERS LOADED ABOVE 27.5K FROM  
; AN UNMAPPED SYSTEM. IT IS, HOWEVER, POSSIBLE TO  
; BOOT A SAVED MAPPED SYSTEM WITH ANY CONFIGURATION  
; FROM ANY UNMAPPED SYSTEM.
```

```
;  
* DO YOU WISH TO CREATE A LARGER COPY OF YOUR SYSTEM? [Y/N]: Y
```

If the answer to this question is affirmative, the following
text is displayed. Otherwise the next display appears under
the heading ALL SYSTEMS.

SYSGEN DIALOGUE DETAILS

```
;
; TO CREATE A SYSTEM IMAGE IN WHICH TASK IMAGES MAY BE FIXED UP
; TO M K WORDS, OR IN WHICH THE TOP OF SAV MAY BE AS HIGH
; AS M K WORDS, YOU MAY CALCULATE THE NUMBER OF BLOCKS (N)
; NEEDED AS FOLLOWS:
;
;     N=(4*M)+2
;
; FOR EXAMPLE A 40K SYSTEM WOULD USE (40.*4)+2=162. BLOCKS
;
;     NOTE:   SAVE IMAGES ON THE 11/70 ARE CURRENTLY
;            SUPPORTED ONLY TO A MAXIMUM OF 124K WORDS
;            (I.E. N=498.) ALSO, THE NUMBER OF BLOCKS
;            IS ASSUMED TO BE OCTAL. TO SPECIFY A
;            DECIMAL NUMBER, APPEND A TRAILING DECIMAL POINT.
;
;            FOR SINGLE RK05 DISTRIBUTION KITS, THE
;            MAXIMUM SYSTEM IMAGE SIZE IS 64K (258.
;            BLOCKS) DUE TO A LACK OF CONTIGUOUS SPACE.
;
; * ENTER THE NUMBER OF BLOCKS FOR YOUR SYSTEM IMAGE FILE [S]: 498.
```

PIP is now invoked to copy the system image file. For example, if the response to this question is 162., the command will be:

```
PIP RSX11M.SYS/CO/NV/BL:162.=RSX11M.TSK
```

The next lines are displayed only if the size of the system is less than 32K or if the user did not want to extend the size of the system image file.

```
;
; WE WILL NOW MAKE A COPY OF YOUR TARGET SYSTEM
;
; PIP RSX11M.SYS/NV=RSX11M.TSK
```

No matter how large the target system is the processing of text and commands continues at this point.

ALL SYSTEMS

```
SET /UIC=[1,5y]
```

```
;
; RSX11M.TSK IS A BACKUP COPY OF THE EXECUTIVE YOU JUST BUILT.
; IF YOU DO NOT WISH TO RETAIN IT, WE WILL DELETE IT NOW.
```

```
;
; * DO YOU WISH TO DELETE THE SYSTEM BACKUP FILE RSX11M.TSK? [Y/N]: N
```

The normal reason (aside from backup) for retaining the RSX11M.TSK file is to be able to set up two or more systems: one for program development, and one for production; or two systems with different partition layouts. If the answer to this question is affirmative, the following command is issued:

```
PIP RSX11M.TSK;0/DE
```

In all SYSGENS, the following text is displayed to guide the user in setting up partitions and installing tasks into the target system Executive.

```
REM PIP
;
```

SYSGEN DIALOGUE DETAILS

```

; YOUR TARGET SYSTEM IS NOW READY TO SET UP PARTITIONS AND INSTALL
; THE REQUIRED TASKS. THE PROCEDURE TO FOLLOW ONCE VIRTUAL MCR
; IS RUNNING IS:
;   ✓1) EXTENDED POOL SPACE TO BASE OF FIRST PARTITION
;   ✓2) SET UP YOUR PARTITIONS
;   ✓2A) SET UP UDC, DSS OR ICS/ICR-11 COMMON BLOCK
;   ✓3) INVOKE THE INDIRECT FILE INSTALL.CMD IN VMR TO
;        INSTALL THE PRIVILEGED TASKS YOU JUST BUILT
;   ✓4) LOAD ANY LOADABLE DRIVERS THAT YOU WANT RESIDENT
;        IN THE SYSTEM IMAGE. IF THE TERMINAL AND/OR SYSTEM DISK
;        DRIVERS ARE LOADABLE, THEY MUST BE LOADED USING VMR.
;   ✓5) EXIT FROM VIRTUAL MCR AND BOOT IN YOUR TARGET SYSTEM
;
* DO YOU WANT A VMR EXAMPLE DISPLAYED? [Y/N]: Y

```

If you answer Y to this question, a VMR example that depicts your system requirements is displayed. Since the example displayed depends on the options you select during SYSGEN, it is omitted here.

```

;
; THE FILE [200,200]INSTALL.CMD CONTAINS COMMANDS
; TO INSTALL ALL THE PRIVILEGED TASKS THAT YOU BUILT
; IN YOUR TARGET SYSTEM.
; YOU MAY WISH TO EDIT INSTALL.CMD TO INCLUDE OTHER TASKS.
; NOTE - IF YOU INSTALL A TASK
; WITH VMR THAT WAS NOT BUILT DURING
; THIS SYSGEN, YOU CANNOT RUN THAT TASK
; IN THE CURRENT SYSTEM!
; THIS IS TRUE FOR BOTH MAPPED AND UNMAPPED
; TARGET SYSTEMS, AND FOR BOTH PRIVILEGED
; AND NON-PRIVILEGED TASKS. THEREFORE,
; BOOT THE NEW SYSTEM IMMEDIATELY
; AFTER SYSGEN HAS FINISHED, OR AVOID
; INSTALLING TASKS WITH VMR THAT WERE
; NOT BUILT DURING THIS SYSGEN.
;
* DO YOU WANT TO EDIT INSTALL.CMD? [Y/N]: probably

```

SYSGEN phase 2 has created the file [200,200]INSTALL.CMD which will be used by VMR to install all the privileged tasks that have been built. If you want to edit that file, answer Y.

```

INS [1,5y]EDI;-1
SET /UIC=[200,200]
EDI INSTALL.CMD
SET /UIC=[1,5y]
REM EDI
;
; NOW WE WILL RUN VIRTUAL MCR SO THAT YOU MAY INITIALIZE
; YOUR SYSTEM.
;
INS $BOO;-1
INS $VMR;-1
ASN SY:=LB:
VMR
;
; WHEN THE INDIRECT FILE EXITS, BOOT IN YOUR TARGET SYSTEM,
; SET THE DATE AND TIME, AND SAVE THE SYSTEM WITH A BOOTSTRAP.
; WHEN YOUR SYSTEM REBOOTS ITSELF, PURGE THE OLD TASK FILES.
;
; E.G.,
; >BOOT RSX11M

```

SYSGEN DIALOGUE DETAILS

```
;
;   RSX11M V03.1 BL22
;   >TIM 1/1/77 12:00:00
;   >SAV /WB
;
;   RSX11M V03.1 BL22   28K
;   >RED DK0:=SY:
;   >MOU DK0:UNMOBJ
;   >@[1,2]STARTUP
;   >* PLEASE ENTER TIME AND DATE (HH:MM MM/DD/YY) [S]:
;   >TIM 1/1/77 12:01
;   >@ <EOF>
;   >SET /UIC=[1,50]
;   >RUN $PIP
;   PIP>*.*/PU
;   PIP>^Z
;
;
;
```

If you selected multiuser protection, the following reminder is displayed.

→; DON'T FORGET TO CREATE ACCOUNTS AFTER SAVING YOUR SYSTEM

The user should bootstrap the user-tailored Executive, using the previous commentary as a model.

3.5 SYSGEN3.CMD FILE DETAILS.

SYSGEN part 3 builds selected utility tasks, and/or user mode diagnostic tasks. For SYSGENS using any distribution kit except the RL01 or single RK05, SYSGEN3 is performed as part of SYSGEN2, if the following question is answered with a Y.

* DO YOU WANT TO REBUILD UTILITIES AND/OR BUILD DIAGNOSTICS? [Y/N]: Y

If you are using an RL01 kit or the single RK05 kit, there is not enough on-line disk storage to do SYSGEN3 during SYSGEN2, and the previous question does not appear during SYSGEN2. In such systems, SYSGEN3 must be invoked manually after SYSGEN2 has finished using the Utility Object Disk (which is part of all distribution kits) as the system disk. The appropriate command is then:

```
>SET /UIC=[200,200]
>@SYSGEN3
```

This section describes details of the SYSGEN3 procedure.

```
;
;   SYSGEN PART 3 <VERSION 03.1>
;
;   COPYRIGHT (C) 1976, 1977
;   DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;
;   BUILD SELECTED UTILITY TASKS AND/OR USER MODE
;   DIAGNOSTICS.
;
;   EXPANDED COMMENTS PROVIDE A DESCRIPTION OF EVERY STEP IN THIS
;   SYSGEN3 COMMAND FILE. ON THE OTHER HAND, SHORT COMMENTS
;   PROVIDE VIRTUALLY NO EXPLANATORY TEXT.
;
```

SYSGEN DIALOGUE DETAILS

* DO YOU WANT EXPANDED COMMENTS FOR SYSGEN PART 3? [Y/N]: Y

The following section of the dialogue establishes certain parameters concerning the current system and the target system. If SYSGEN3 has been called from SYSGEN2, after answering Y to the question

* DO YOU WANT TO REBUILD UTILITIES AND/OR BUILD DIAGNOSTICS? [Y/N]: Y

These parameters are already known, and the following section is bypassed.

* ARE YOU RUNNING ON A MACHINE WITH AT LEAST 24K WORDS? [Y/N]: Y

If the current system has less than 24K words of memory, the utility tasks cannot be built. The following message is displayed and SYSGEN3 terminates.

```
;
; SORRY, YOU CANNOT BUILD ANY UTILITIES WITH A MACHINE
; SMALLER THAN 24K WORDS!
;
```

-----If the system has enough memory, processing continues here.

* ARE YOU BUILDING A MAPPED SYSTEM? [Y/N]: Y

The following questions are asked to determine the distribution kit you are using. An affirmative answer suppresses further distribution kit queries.

* DO YOU HAVE THE SINGLE RK05 DISTRIBUTION KIT? [Y/N]: N

If not, the next question is asked.

* DO YOU HAVE THE DUAL RK05 DISTRIBUTION KIT? [Y/N]: N

If you have this kit, you must then identify the RK05 units that contain the BASLINE and UTILOBJ disks.

If you do not have the dual RK05 kit, the next two queries are omitted.

* IN WHICH RK05 UNIT IS THE BASLINE DISK MOUNTED?:

* IN WHICH RK05 UNIT IS THE UTILOBJ DISK MOUNTED?:

These are then assigned to LB: and SY:.

* DO YOU HAVE THE RL01 DISTRIBUTION KIT? [Y/N]: N

* ARE YOU RUNNING ON A MACHINE WITH A LINEPRINTER? [Y/N]: Y
* WAS ANSI MAGTAPE SUPPORT SELECTED IN SYSGEN PART 1? [Y/N]: Y

Processing continues here if SYSGEN3 was called automatically from SYSGEN2.

* WAS USER MODE DIAGNOSTIC SUPPORT SELECTED IN SYSGEN PART 1? [Y/N]: N?

Since SYSGEN3 may be called to build either utility tasks or user mode diagnostic tasks or both, the following two questions are asked to determine further action. (The second question is asked only if user mode diagnostic support was selected in SYSGEN part 1.)

SYSGEN DIALOGUE DETAILS

* DO YOU WANT TO REBUILD ANY UTILITY TASKS? [Y/N]: Y

If user mode diagnostic support was not selected in part 1, you cannot build the user mode diagnostics. Therefore, if not selected previously, the next question is omitted.

* DO YOU WANT TO BUILD ANY USER MODE DIAGNOSTICS? [Y/N]: Y

The responses to the above queries determine which of the following sections will be displayed.

If you wish to rebuild any of the utility tasks and none of the user mode diagnostics, only those queries under the heading UTILITY TASKS are displayed. The queries under the heading USER MODE DIAGNOSTICS are omitted.

If you wish to build user mode diagnostics (provided that user mode diagnostic support was selected in part 1) and not rebuild any utility tasks, only those queries under the heading USER MODE DIAGNOSTICS are displayed. The queries concerning rebuilding utility tasks are omitted.

If you wish to rebuild utility tasks and also build user mode diagnostics, both sections are displayed.

UTILITY TASKS

```
;
; IN ORDER FOR THE UTILITY TASKS TO USE ANSI FORMAT TAPE
; THEY MUST BE BUILT WITH THE ANSI FCS ROUTINES. THESE
; ROUTINES MAY CAUSE CERTAIN TASKS TO INCREASE BEYOND THE
; NORMAL 8K SIZE.
;
; IF YOU WANT TO BUILD THE UTILITY TASKS WITH
; ANSI MAGTAPE SUPPORT, YOU HAVE TO EDIT THE TASK
; BUILD COMMAND FILES FOR THESE TASKS.
;
```

The task-build command file for a particular utility task has to be edited only if the task size turns out to be above 8K words. This means that SYSGEN3 may have to be run a second time.

```
; YOU MUST ALSO INCLUDE THE FILE CONTROL SERVICES ROUTINES
; FOR ANSI MAGTAPE SUPPORT IN SYSLIB.
```

As described above, you must include the ANSI magtape FCS routines in SYSLIB, if you have selected ANSI magtape support. It is possible that these changes to SYSLIB have already been made by a previous SYSGEN3 on this disk. If so, answer Y to the next question.

* IS SYSLIB ALREADY CORRECT FROM A PREVIOUS RUN OF THIS FILE? [Y/N]: N

If the answer to this question is Y, the next section is bypassed. Otherwise the following commands create a new version of SYSLIB.

```
INS $PIP
INS $LBR
```

If you are using the dual RK05 kit, the RK05 unit containing the BASLINE disk is assigned to the pseudo device SY:.

SYSGEN DIALOGUE DETAILS

ASN DKn:=SY:

SET /UIC=[1,1]

If you are using an RL01 kit or either of the RK05 kits, the following command is issued.

PIP SYSLIB.OLB;*/DE
PIP SYSLIB.OLB=SYSLIB.VIR

If you want the utility tasks to support ANSI magtape, answer Y to the next question, and the following command is executed to include the FCS routines in SYSLIB.

* DO YOU WANT THE UTILITY TASKS TO SUPPORT ANSI MAGTAPE? [Y/N]: Y
LBR SYSLIB/RP=FCSMTA

Further processing for an RK05 system continues with the REM PIP command below.

For systems with an RP, RK06, RM03 as system disk, if ANSI magtape support was selected, the special version of SYSLIB called ANSLIB containing the ANSI routines, was created during SYSGEN part 2. Furthermore, the ARITH module in both SYSLIB and ANSLIB is already the correct one.

Therefore, processing for RP, RK06, RM03 systems needs to ask only the following question.

INS \$PIP
INS \$LBR
SET /UIC=[1,1]

* DO YOU WANT THE UTILITY TASKS TO SUPPORT ANSI MAGTAPE? [Y/N]: Y

If the answer to this question is Y, the following command is issued to temporarily rename ANSLIB to SYSLIB, for use during the task-builds to come. It will later be renamed back to SYSLIB. As a result of this, two passes are needed if you are building the utilities with or without ANSI support.

PIP SYSLIB.OLB/NV=ANSLIB.OLB

Processing continues here for systems with ANSI magtape support, whatever the system disk is.

REM PIP
REM LBR

Processing continues here for all systems whether ANSI magtape support was selected or not.

;
; MOST OF THE TASKS TO BE BUILT HAVE TASK BUILD
; COMMAND FILES WHICH SPECIFY PARTITION GEN OR
; PAR14K. GEN IS ASSUMED TO BE 40000(8) BYTES LONG
; AND IS ASSUMED TO BE BASED AT 40000(8).
; PAR14K IS A PARTITION WHICH IS 70000(8) BYTES LONG
; AND IS ASSUMED TO BE BASED AT 40000(8).
;

For a mapped system, no physical base addresses are required for partitions, and the corresponding two lines above are suppressed.

SYSGEN DIALOGUE DETAILS

```

;
; TASK FTB IS A FAST TASK BUILDER WITH LIMITED FUNCTIONALITY.
; IT DOES NOT SUPPORT OVERLAYS OR GLOBAL CROSS-REFERENCE
; BUT IT IS THREE TIME FASTER THAN BIGTKB. IT REQUIRES
; A 20K PARTITION TO RUN IN AND IS NOT DISTRIBUTED IN TASK
; IMAGE FORM. YOU MUST BUILD IT IF YOU INTEND TO USE IT.
;
; THE TASK DSC IS THE DISK SAVE AND COMPRESS UTILITY. IT IS
; DISTRIBUTED AS A STANDALONE SYSTEM ON ALL DISTRIBUTION SYSTEMS
; AS DSCSYS.SYS. IT MAY ALSO BE BUILT AS A TASK, BUT IS NOT
; DISTRIBUTED IN THAT FORM. IT REQUIRES A 16K PARTITION TO RUN IN.
;
; ALL OF THE TASK BUILD COMMAND FILES BUILD CHECKPOINTABLE
; TASKS FOR USE WITH SYSTEMS WITH DYNAMIC ALLOCATION OF
; CHECKPOINT SPACE. IF YOUR SYSTEM DOES NOT SUPPORT
; THIS OPTION, INSTALL WILL DEFAULT THEM TO NON-CHECKPOINTABLE.
; IF YOU WISH YOU MAY BUILD TASKS WHICH ARE CHECKPOINTABLE
; AND WHICH ALLOCATE SPACE IN THEIR TASK IMAGE BY CHANGING
; THE /CP SWITCH TO THE /AL SWITCH IN THE BUILD COMMAND FILE.
;     NOTE: TASKS WHICH ALLOCATE CHECKPOINT SPACE IN THEIR
;     TASK IMAGE REQUIRE MORE DISK SPACE THAN TASKS THAT DON'T.
; NOTE THAT THE TASKS TEC, VTEC, RNO, AND SRD ARE NOT SUPPORTED
; PRODUCTS. THEY HAVE BEEN ADDED TO THE SYSGEN3 PROCEDURE
; FOR YOUR CONVENIENCE.
SET /UIC=[1,2x]
INS $EDI
* DO YOU WANT TO BUILD TASK MAC? [Y/N]: N
* DO YOU WANT TO EDIT TASK MAC'S BUILD COMMAND FILE? [Y/N]:
EDI MACBLD.CMD

```

The previous three lines serve the following purposes:

1. to decide whether to build task MAC
2. if MAC is to be built, to edit the build command file, if desired

If the first question is answered with N, the two following lines do not appear. If the first question is answered with Y, and the second with N, the EDI command is not issued.

In the following, a similar sequence is performed for each utility task.

```

* DO YOU WANT TO BUILD TASK BIGMAC? [Y/N]: Y
* DO YOU WANT TO EDIT TASK BIGMAC'S BUILD COMMAND FILE? [Y/N]: N
EDI BIGMACBLD.CMD
* DO YOU WANT TO BUILD TASK TKB? [Y/N]: N
* DO YOU WANT TO EDIT TASK TKB'S BUILD COMMAND FILE? [Y/N]:
EDI TKBBLD.BMD
* DO YOU WANT TO BUILD TASK BIGTKB? [Y/N]: Y
* DO YOU WANT TO EDIT TASK BIGTKB'S BUILD COMMAND FILE? [Y/N]: N
EDI BIGTKBBLD.CMD
* DO YOU WANT TO BUILD TASK PIP? [Y/N]: Y
* DO YOU WANT TO EDIT TASK PIP'S BUILD COMMAND FILE? [Y/N]: N
EDI PIPBLD.CMD
* DO YOU WANT TO BUILD TASK FLX? [Y/N]: Y
* DO YOU WANT TO EDIT TASK FLX'S BUILD COMMAND FILE? [Y/N]: N
EDI FLXBLD.CMD
* DO YOU WANT TO BUILD TASK VFY? [Y/N]: Y
* DO YOU WANT TO EDIT TASK VFY'S BUILD COMMAND FILE? [Y/N]: N
EDI VFYBLD.CMD
* DO YOU WANT TO BUILD TASK DMP? [Y/N]: Y

```

how many are built or installed

SYSGEN DIALOGUE DETAILS

* DO YOU WANT TO EDIT TASK DMP'S BUILD COMMAND FILE? [Y/N]: N
 EDI DMPBLD.CMD
 * DO YOU WANT TO BUILD TASK EDI? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK EDI'S BUILD COMMAND FILE? [Y/N]:
 EDI EDIBLD.CMD
 * DO YOU WANT TO BUILD TASK SLP? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK SLP'S BUILD COMMAND FILE? [Y/N]:
 EDI SLPBLD.CMD
 * DO YOU WANT TO BUILD TASK LBR? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK LBR'S BUILD COMMAND FILE? [Y/N]:
 EDI LBRBLD.CMD
 * DO YOU WANT TO BUILD TASK TEC? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK TEC'S BUILD COMMAND FILE? [Y/N]:
 EDI TECBLD.CMD
 * DO YOU WANT TO BUILD TASK VTEC? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK VTEC'S BUILD COMMAND FILE? [Y/N]:
 EDI VTECBLD.CMD
 * DO YOU WANT TO BUILD TASK PSE? [Y/N]: Y
 * DO YOU WANT TO EDIT PSE'S BUILD COMMAND FILE? [Y/N]:
 EDI PSEBLD.CMD
 * DO YOU WANT TO BUILD TASK SYE? [Y/N]: Y
 * DO YOU WANT TO EDIT SYE'S BUILD COMMAND FILE? [Y/N]:
 EDI SYEBLD.CMD
 * DO YOU WANT TO BUILD TASK CRF? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK CRF'S BUILD COMMAND FILE? [Y/N]:
 EDI CRFBLD.CMD
 * DO YOU WANT TO BUILD TASK ZAP? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK ZAP'S BUILD COMMAND FILE? [Y/N]:
 EDI ZAPBLD.CMD
 * DO YOU WANT TO BUILD TASK BAD? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK BAD'S BUILD COMMAND FILE? [Y/N]:
 EDI BADBLD.CMD
 * DO YOU WANT TO BUILD TASK VMR? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK VMR'S BUILD COMMAND FILE? [Y/N]:
 EDI VMRBLD.CMD
 * DO YOU WANT TO BUILD TASK RNO? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK RNO'S BUILD COMMAND FILE? [Y/N]:
 EDI RNOBLD.CMD
 * DO YOU WANT TO BUILD TASK SRD? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK SRD'S BUILD COMMAND FILE? [Y/N]:
 EDI SRDBLD.CMD
 * DO YOU WANT TO BUILD TASK FTB? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK FTB'S BUILD COMMAND FILE? [Y/N]: ✓
 EDI FTBBLD.CMD
 * DO YOU WANT TO BUILD TAS CMP? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK CMP'S BUILD COMMAND FILE? [Y/N]:
 EDI CMPBLD.CMD
 * DO YOU WANT TO BUILD TASK PAT? [Y/N]: Y
 * DO YOU WANT TO EDIT TASK PAT'S BUILD COMMAND FILE? [Y/N]:
 * DO YOU WANT TO BUILD TASK DSC? [Y/N]: Y ✓
 * DO YOU WANT TO EDIT TASK DSC'S BUILD COMMAND FILE? [Y/N]:
 EDI DSCBLD.CMD
 * DO YOU WANT TO BUILD TASK CDA? [Y/N]: Y ✓
 * DO YOU WANT TO EDIT CDA'S BUILD COMMAND FILE? [Y/N]:
 EDI CDABLD.CMD
 * DO YOU WANT TO BUILD TASK EDT? [Y/N]: Y
 * DO YOU WANT TO EDIT EDT'S BUILD COMMAND FILE? [Y/N]:
 EDI EDTBLD.CMB

If you are using the single RK05 distribution kit, you cannot build the RMS utilities. The RMS utilities can only be built when using any of the other kits, hence the following queries, pertinent to RMS, are not displayed in SYSGEN using the single RK05 kit.

SYSGEN DIALOGUE DETAILS

* DO YOU WANT TO BUILD THE RMS UTILITIES? [Y/N]: Y

If you answer affirmatively, the following queries, pertinent to RMS utilities, are displayed. Otherwise, they are omitted.

* DO YOU WANT TO BUILD TASK RMSBCK? [Y/N]: Y

* DO YOU WANT TO EDIT TASK RMSBCK'S BUILD COMMAND FILE? [Y/N]:

EDI RMSBCKBLD.CMD

* DO YOU WANT TO BUILD TASK RMSCNV? [Y/N]: Y

* DO YOU WANT TO EDIT TASK RMSCNV'S BUILD COMMAND FILE? [Y/N]:

EDI RMSCNVBLD.CMB

* DO YOU WANT TO BUILD TASK RMSDEF? [Y/N]: Y

* DO YOU WANT TO EDIT TASK RMSDEF'S BUILD COMMAND FILE? [Y/N]:

EDIT RMSDEFBLD.CMD

* DO YOU WANT TO BUILD TASK RMSDFN? [Y/N]: Y

* DO YOU WANT TO EDIT TASK RMSDFN'S BUILD COMMAND FILE? [Y/N]:

EDI RMSDFNBLD.CMD

* DO YOU WANT TO BUILD TASK RMSDSP? [Y/N]: Y

* DO YOU WANT TO EDIT TASK RMSDSP'S BUILD COMMAND FILE? [Y/N]:

EDI RMSDSPBLD.CMD

* DO YOU WANT TO BUILD TASK RMSRST? [Y/N]: Y

* DO YOU WANT TO EDIT TASK RMSRST'S BUILD COMMAND FILE? [Y/N]:

EDI RMSRSTBLD.CMD

INS [1,5y]PIP

INS [1,5y]BIGTKB

* DO YOU WANT TO PRINT THE MAPS FOR THE UTILITY TASKS? [Y/N]: N

The maps for the utility tasks are of little use, and this question is normally answered with an N, in which case no maps are generated.

;
; THE TASK MAPS WILL BE PRINTED ON
; YOUR TERMINAL
; THE LINE PRINTER
LOA LP:

The next display is dependent upon the distribution kit you are using.

If you are using an RL01 distribution kit or either of the RK05 distribution kits, you must make some preparations prior to building the utility tasks. Read the section pertinent to your distribution kit.

If you are using a distribution kit other than an RL01, single RK05, or dual RK05, no preparations are necessary.

Single RK05 and RL01 Kits

; DEPENDING ON THE SECONDARY STORAGE MEDIUM AND THE NUMBER
; OF TASKS TO BE COPIED, YOU MAY HAVE TO MOUNT A BLANK MEDIUM
; IN THE DRIVE AFTER COPYING A TASK. THE RECOMMENDED NUMBER OF FILES
; PER MEDIUM IS:
; RK05, RL01 AND MAGTAPE (TS03, RU10, TU16, TU45) - ALL TASKS WILL FIT
; FLOPPY DISK AND DECTAPE - 4 TASKS PER DISK OR TAPE
; CASSETTE - 1 TASK PER CASSETTE
;
; IF YOUR SECONDARY STORAGE IS OTHER THAN RK05, RL01 OR MAGTAPE,

SYSGEN DIALOGUE DETAILS

; AFTER COPYING A TASK, YOU WILL BE ASKED IF YOU WISH TO MOUNT
; A NEW MEDIUM. IF SO THE INDIRECT FILE PROCESSOR WILL
; PAUSE TO ALLOW TIME TO MOUNT IT.
;

; THE FOLLOWING ARE LEGAL SECONDARY STORAGE DEVICES:
; DK (RK05 DISK, FOR RK05 DISTRIBUTION KITS ONLY)
; DL (RL01 DISK, FOR RL01 DISTRIBUTION KITS ONLY)
; DX (RX01 FLOPPY DISK)
; CT (TU60 CASSETTE TAPE)
; DT (TU56 DECTAPE)
; MT (TS03, TE10, OR TU10 MAGTAPE)
; MM (TU16, TE16, OR TU45 MAGTAPE)

* ENTER DEVICE FOR SECONDARY STORAGE [DDU] [S]:

The next query displayed is dependent on your secondary storage device.

DK: or DL: as Secondary Storage Device

The following assumes DK: was entered as the secondary storage device.

; PUT YOUR TARGET SYSTEM DISK IN DK:

* IS DK: READY? [Y/N]:

This query is repeated until the device is ready (Y response).

* ENTER VOLUME LABEL OF DK: [S]:

The device is then mounted using this volume label.

MOU DK: label

DX: as Secondary Storage Device

If DX: is not loaded, the MCR LOA command is issued.

LOA DX:

CT:,DT:,MT:, or MM:, as Secondary Storage

The following assumes DT: was entered as the secondary storage device.

If the secondary storage device is not loaded, the MCR LOA command is issued.

LOAD DT:

Dual RK05 Kits

* DO YOU HAVE AN EMPTY RK05 REMOVABLE DRIVE AVAILABLE? [Y/N]:

If not, instructions are given for copying the task image files from secondary storage to the system disk.

If an empty drive is available, you are asked to identify the unit number.

* WHAT IS THE UNIT NUMBER OF THE EMPTY DRIVE? [O R:0-3]:

SYSGEN DIALOGUE DETAILS

The following assumes that DK2: is the empty drive.

```
; PLACE THE SYSTEM DISK IN DK2: AND START IT UP (WRITE  
; ENABLED). WE WILL COPY THE TASKS DIRECTLY TO THE SYSTEM DISK.
```

```
* IS THE SYSTEM DISK READY? [Y/N]:
```

This question is repeated until the disk is ready (Y response). When ready, the disk is mounted.

```
MOU DK2:SYSTEM
```

```
* WAS THE SYSTEM DISK MOUNTED SUCCESSFULLY? [Y/N]:
```

If not, the MOU command is issued again.

```
;  
; NOW WE BUILD THE REQUESTED UTILITY TASKS  
;  
ASN LP:=MP:  
ASN TT:=MP:  
ASN NL:=MP:  
SET /UIC=[1,20]
```

The selected utility tasks are now built.

If you are using the RL01 distribution kit or either of the RK05 distribution kits, the build files are copied to your secondary storage device and the old versions are deleted. Depending on your secondary storage device, either PIP or FLX is used to accomplish this (PIP for DL:, DK:, or DX: as secondary storage and FLX for CT:, DT:, MM:, MT: as secondary storage). The appropriate command is issued following the task builder directive. The following is an example of the display for a dual RK05 SYSGEN using an RK05 (DK:) for secondary storage.

```
TKB @[1,2x] MACBLD  
PIP DK:[1,5x]/NV=[1,5x]MAC.TSK  
* WAS MAC COPIED SUCCESSFULLY? [Y/N]:  
PIP [1,5x]MAC.TSK;0/DE
```

For brevity, the PIP and/or FLX commands, which appear only if you are using an RL01 kit or either of the RK05 kits, are omitted here.

Note that all commands are suppressed for a specific task if that task was not selected to be rebuilt. The following displays all of the tasks.

Similar commands are issued to build each of the selected utility tasks. In some cases, the old versions are purged (PIP.../PU), leaving the most recent version, instead of being deleted (PIP.../DE). The reason for this is to keep tasks that may be required at later stages during SYSGEN.

```
TKB @[1,2x]MACBLD  
TKB @[1,2x]BIGMACBLD  
TKB @[1,2x]TKBBLD  
TKB @[1,2x]BIGTKBBLD  
TKB @[1,2x]PIPBLD  
TKB @[1,2x]FLXBLD  
TKB @[1,2x]VFYBLD  
TKB @[1,2x]DMPBLD
```

SYSGEN DIALOGUE DETAILS

```
TKB @[1,2x]EDIBLD
TKB @[1,2x]SLPBLD
TKB @[1,2x]LBRBLD
TKB @[1,2x]PSEBLD
TKB @[1,2s]SYEBLD
TKB @[1,2x]CRFBLD
TKB @[1,2x]ZAPBLD
TKB @[1,2x]BADBLD
TKB @[1,2x]VMRBLD
TKB @[1,2x]PATBLD
TKB @[1,2x]CDABLD
TKB @[1,2x]CMPBLD
TKB @[1,2x]FTBBLD
TKB @[1,2x]DSCBLD
TKB @[1,2x]RNOBLD
TKB @[1,2x]TECBLD
TKB @[1,2x]SRDBLD
TKB @[1,2x]EDTBLD
TKB @[1,2x]RMSBCKBLD
TKB @[1,2x]RMSCNVBLD
TKB @[1,2x]RMSDEFBLD
TKB @[1,2x]RMSDFNBLD
TKB @[1,2x]RMSDSPBLD
TKB @[1,2x]RMSRTIBLD
TKB @[1,2x]VTECBLD
```

The task-builds are complete.

If user mode diagnostics were to be built, control passes to the indirect command file BLDUMD.CMD (see Section x.x.x). The task image files that have been built (utilities and/or user mode diagnostics) will now be transferred to secondary storage.

```
;
; WE WILL PAUSE NOW TO ALLOW YOU TO COPY
;   - ANY FILES THAT WERE NOT SUCCESSFULLY TRANSFERRED
;   - THE DIAGNOSTIC TASKS
; WHEN THE DIAGNOSTIC TASKS HAVE BEEN COPIED, YOU
; MAY DELETE THEM FROM THIS DISK.
; WHEN DONE, RESUME AT. AS SHOWN BELOW.
```

If only user mode diagnostics were selected to be built and no utility task, an example of how to do the transfers is displayed like the one below.

```
;
; (PUT A BLANK MEDIUM IN MT0:)
; >REM PIP
; >INS [1,54]FLX;-1
; >FLX MT0:/ZE
; >FLX MT0:/DO=RK05.TSK/RS,TS03.TSK,TERM.TSK
; >RES ...AT.
;
```

AT. -- PAUSING. TO CONTINUE TYPE "RES ...AT."

At this time, you may manually copy any files that were not successfully transferred by the previous commands, and/or the user mode diagnostics if they were selected to be built.

```
DMO DX0:
UNL DX0:
```

SYSGEN DIALOGUE DETAILS

The secondary storage is dismounted and the driver unloaded.

If you have a dual-RK05 system, the task image files are now resident on the target system disk. Otherwise, the following section of text is displayed to guide you in transferring the task image files to the target system disk.

```
;  
; TO COPY THE TASK IMAGE FILES FROM THE SECONDARY  
; STORAGE MEDIUM TO THE SYSTEM DISK, PROCEED AS FOLLOWS  
; AFTER SYSGEN3 HAS TERMINATED:  
;
```

If your secondary storage is DX, the following example is displayed (u is replaced by the actual unit number):

```
;  
; (BOOT THE SYSTEM DISK)  
; >SET /UIC=[1,5x]  
; >INS PIP  
; >LOA DX:  
;  
; ! REPEAT FROM HERE...  
; >MOU DXu:TASKX ! REPLACE "TASKX" BY  
; ! ACTUAL VOLUME LABEL  
; >PIP =DXu:*. *  
; >DMO DXu: ! ...TO HERE FOR ALL VOLUMES  
; ! USED FOR TRANSFER  
; >UNL DX:  
; >REM PIP  
;
```

If your secondary storage is MT, MM, CT or DT, the following example is displayed (dd is replaced by the actual device mnemonic, and u is replaced by the actual unit number):

```
;  
; (BOOT THE SYSTEM DISK)  
; >SET /UIC=[1,5x]  
; >INS FLX  
; >LOA dd:  
;  
; ! REPEAT FROM HERE...  
; >FLX =ddu:*. *  
; ! ...TO HERE FOR ALL VOLUMES  
; ! USED FOR TRANSFER  
; >UNL dd:  
; >REM FLX  
; >INS PIP;-1  
; >@MTSKCO ! MAKE TASK FILES CONTIGUOUS  
; ! A SERIES OF PIP COMMANDS FOLLOW  
; >@ <EOF>  
; >PIP MTSKCO.CMD;0/DE  
; >REM PIP  
;
```

```
REM FLX  
REM INI  
REM UFD  
REM PIP
```

USER MODE DIAGNOSTICS

Due to space limitations and the physical locations of files on the RK05 distribution kits, the user mode diagnostics are built in slightly differing ways. Read the section pertinent to your distribution kit.

SYSGEN DIALOGUE DETAILS

SET /UIC=[1,20]

****Single RK05 and RL01 Kits****

; NOW WE BUILD AND COPY THE TASKS TO THE SECONDARY
; STORAGE MEDIUM.
; DEPENDING ON THE SECONDARY STORAGE MEDIUM AND THE NUMBER
; OF TASKS TO BE COPIED, YOU MAY HAVE TO MOUNT A BLANK MEDIUM
; IN THE DRIVE AFTER COPYING A TASK. THE RECOMMENDED NUMBER OF FILES
; PER MEDIUM IS:
; RK05,RL01 AND MAGTAPE (TS03,TU10,TU16,TU45) - ALL TASKS WILL FIT
; FLOPPY DISK AND DECTAPE - 4 TASKS PER DISK OR TAPE
; CASSETTE - 1 TASK PER CASSETTE
;
; IF YOUR SECONDARY STORAGE IS OTHER THAN RK05, RL01 OR MAGTAPE,
; AFTER COPYING A TASK, YOU WILL BE ASKED IF YOU WISH TO MOUNT
; A NEW MEDIUM. IF SO THE INDIRECT FILE PROCESSOR WILL
; PAUSE TO ALLOW TIME TO MOUNT IT.
;
; THE FOLLOWING ARE LEGAL SECONDARY STORAGE DEVICES:
; DK (RK05 DISK, FOR RK05 DISTRIBUTION KITS ONLY)
; DL (RL01 DISK, FOR RL01 DISTRIBUTION KITS ONLY)
; DX (RX01 FLOPPY DISK)
; CT (TU60 CASSETTE TAPE)
; DT (TU56 DECTAPE)
; MT (TS03, TE10, OR TU10 MAGTAPE)
; MM (TU16, TE16, OR TU45 MAGTAPE)

* ENTER DEVICE FOR SECONDARY STORAGE [DDU] [S]:

The next query displayed is dependent on your secondary storage device.

DK: or DL: as Secondary Storage Device

The following assumes DK: was entered as the secondary storage device.

; PUT YOUR TARGET SYSTEM DISK IN DK:

* IS DK: READY? [Y/N]:

This query is repeated until the device is ready (Y response).

* ENTER VOLUME LABEL OF DK: [S]:

The device is then mounted using this volume label.

MOU DK:volume label

Control then passes to the indirect command file BLDUMD.CMD (see that Section).

DX: as Secondary Storage Device

If DX: is not loaded, the MCR LOA command is issued.

LOA DX:

; TO COPY THE TASK IMAGE FILES FROM THE SECONDARY
; STORAGE MEDIUM TO THE SYSTEM DISK, PROCEED AS FOLLOWS
; AFTER SYSGEN3 HAS TERMINATED:
;

SYSGEN DIALOGUE DETAILS

```

; Z
;
; (BOOT THE SYSTEM DISK)
; >SET /UIC = [1,5x]
; >INS $PIP
; >LOA DX:
;
;
; !REPEAT FROM HERE...
; >MOU DX:TASKX ! REPLACE "TASKX" BY
; ! ACTUAL VOLUME LABEL
;
; >PIP = DX:*. *
; >DMO DX:
; !...TO HERE FOR ALL VOLUMES
; !USED FOR TRANSFER
; >UNL DX:

```

Control then passes to the indirect command file BLDUMD.CMD (see Section x.x.x).

CT:, DT:, MT:, or MM: as Secondary Storage Device

The following assumes DT: was entered as the secondary storage device.

If the secondary storage device is not loaded, the MCR LOA command is issued.

LOA DT:

```

; TO COPY THE TASK IMAGE FILES FROM THE SECONDARY
; STORAGE MEDIUM TO THE SYSTEM DISK, PROCEED AS FOLLOWS
; AFTER SYSGEN3 HAS TERMINATED:
;
; (BOOT THE SYSTEM DISK)
; >SET /UIC = [1,5x]
; >INS $FLX
; >LOA DT:
;
; ! REPEAT FROM HERE...
; >FLX = DT:*. *
; ! ... TO HRE FOR ALL VOLUMES
; ! USED FOR TRANSFER
; >UNL DT:

```

; >REM FLX

Control then passes to the indirect command file BLDUMD.CMD (see Section xxx).

Dual RK05 Kits

* DO YOU HAVE AN EMPTY RK05 REMOVABLE DRIVE AVAILABLE? [Y/N]:

If not, instructions are given for copying the task image files from secondary storage to the system disk.

If an empty drive is available, you are asked to identify the unit number.

* WHAT IS THE UNIT NUMBER OF THE EMPTY DRIVE? [0 R:0-3]:

The following assumes that DK2: is the empty drive.

; PLACE THE SYSTEM DISK IN DK2: AND START IT UP (WRITE ENABLED). WE WILL COPY THE TASKS DIRECTLY TO THE SYSTEM DISK.

SYSGEN DIALOGUE DETAILS

* IS THE SYSTEM DISK READY? [Y/N]:

This question is repeated until the disk is ready (Y response). When ready, the disk is mounted.

MOU DK2:SYSTEM

* WAS THE SYSTEM DISK MOUNTED SUCCESSFULLY? [Y/N]:

If not, the MOUNT command is issued again.

If mounted successfully, control passes to the indirect command file BLDUMD.CMD (see Section x.x.x).

****All Kits Except RL01 Kit and RK05 Kits****

Control is passed directly to the indirect command file BLDUMD.CMD (see Section x.x.x).

End of SYSGEN part 3.

3.6 BLDUMD.CMD FILE DETAILS

BLDUMD is the indirect command file to task-build all or selected User Mode Diagnostics. BLDUMD is called from SYSGEN part 3 if the corresponding question is answered appropriately. It may also be called manually at any time with the following command:

```
>@[200,200]BLDUMD
```

The following is a detailed description of all the steps in BLDUMD.

```
;
; BLDUMD <VERSION 03.1>
;
; COPYRIGHT (C) 1976, 1977
; DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;
; BUILD ALL OR SELECTED USER MODE DIAGNOSTICS.
;
;
* ARE YOU RUNNING ON A MACHINE WITH AT LEAST 24K WORDS? [Y/N]: Y
;
```

If the answer is N, the following text is displayed and BLDUMD terminates.

```
;
; SORRY, YOU CANNOT BUILD (OR RUN) THE USER MODE DIAGNOSTICS
; ON A MACHINE WITH LESS THAN 24 K WORDS!
;
```

Otherwise, processing continues here.

As in the previous sections of SYSGEN, you must identify your distribution kit.

* DO YOU HAVE THE DUAL RK05 DISTRIBUTION KIT? [Y/N]: N

If you do, you are asked to identify the RK05 drives that contain the UTILOBJ and BASLINE disks. The UTILOBJ disk is then assigned to SY: and the BASLINE disk is assigned to LB:.

SYSGEN DIALOGUE DETAILS

* IN WHICH RK05 DRIVE IS THE UTILOBJ DISK MOUNTED? [O R:0-3]:

* IN WHICH RK05 DRIVE IS THE BASLINE DISK MOUNTED? [O R:0-3]:

The following assumes DK0: for the UTILOBJ disk and DK1:
for the BASLINE disk.

ASN DK0:=SY:
ASN DK1: =LB:

If you replied negatively to the dual RK05 query, the next
query displayed is

* IS THE CURRENT SYSTEM DISK AN RP02/03/04/05/05 OR RK06? Y

* DO YOU WANT EXPANDED COMMENTS FOR THE UMD BUILD PROCEDURE? [Y/N]: Y

Expanded comments provide a lot of descriptive text that the
experienced user might want to dispense with.

;
; DIAGNOSTIC TASKS CAN BE BUILT FOR THE FOLLOWING DEVICES:

;
; MNEMONIC DEVICE DIAGNOSTIC NAME

;
; DB: RJP04/RWP04 RP04
; DB: RJP05/RWP05 RP05
; DB: RJP06/RWP06 RP06
; DF: RF11/RS11 RF11
; DK: RK11/RK05 RK05
; DM: RK611/RK06 RK06
; DP: RP11/RP02 RP02
; DP: RP11/RP03 RP03
; DP: RP11E/RPR02 RPR02
; DS: RJS03/RWS03 RS03
; DS: RJS04/RWS04 RS04
; DT: TC11/TU56 TU56
; MM: TJU16/TWU16 TU16
; MM: TJU16/TWU45 TU45
; MT: TM11/TU10 TU10
; MT: TM11/TS03 TS03
; TT: TERMINAL TERM

;
* DO YOU WANT DIAGNOSTICS FOR A MAPPED SYSTEM? [Y/N]: Y

;
SET UIC=[1,2x]

If you are using other than a dual RK05 distribution kit,
the task image files will be generated on the system disk,
and the next section is bypassed.

;
; THE DIAGNOSTIC TASKS WILL BE STORED ON THE SYSTEM DISK BY DEFAULT.
; IF YOUR SYSTEM DISK IS AN RK05 YOU MAY BE REQUIRED TO STORE THE
; DIAGNOSTICS ON A SEPARATE DISK TO AVOID ALLOCATION PROBLEMS.

;
; IF YOU HAVE THE DUAL RK05 RELEASE KIT, YOU SHOULD SPECIFY
; THAT THE DIAGNOSTICS BE STORED ON ANOTHER DISK. IF YOU HAVE
; A THIRD RK05 PUT THE PRIVOBJ DISK IN IT AND STORE THE DIAGNOSTICS
; ON IT. OTHERWISE, STORE THEM ON LB0:.

SYSGEN DIALOGUE DETAILS

* DO YOU WANT THE DIAGNOSTICS STORED ON ANOTHER DISK? [Y/N]:

If this question is answered with an N, the next section is bypassed. Otherwise, you are asked for the device mnemonic and unit number of the disk where to store the diagnostics.

* ENTER THE OUTPUT DEVICE NAME AND UNIT NUMBER (E.G. DK1) [S]:

It is assumed in the following lines that you answered this question with DK1.

```
;
; THE COMMAND BUILD FILE WILL NOW PAUSE WHILE YOU MOUNT DK1:
; YOU MUST CREATE THE UFD'S [1,3x] AND [1,5x] ON THE DISK
; (THE FORMER ONLY IF YOU WANT THE TASK BUILD MAPS) IF THEY
; DO NOT ALREADY EXIST.
```

; EXAMPLE:

```
; >INIT DK1:DIAGNOSTICS
; >MOUNT DK1:DIAGNOSTICS
; >UFD DK1:[1,3x]
; >UFD DK1:[1,5x]
```

AT. -- PAUSING. TO RESUME TYPE "RES ...AT."

Whatever the system disk type is, processing continues here.

```
;
; DIAGNOSTICS ARE GENERALLY RUN WITH THE FOLLOWING ATTRIBUTES:
```

```
;
; PARTITION = GEN
; BASE ADDRESS = 40000
; SIZE = 40000
```

The last two lines appear only if you are building diagnostics for an unmapped system.

```
;
; IF YOUR SYSTEM IS DIFFERENT ANSWER YES TO THE FOLLOWING QUESTION.
```

* DO YOU WANT TO ALTER THE DEFAULT PARTITION ATTRIBUTES? [Y/N]:

The following three questions are bypassed if you answered this question with an N.

* ENTER THE PARTITION NAME (DEFAULT=GEN) [S]:

The following question is asked only if you are building diagnostics for an unmapped system.

* ENTER THE PARTITION BASE ADDRESS (DEFAULT=40000) [S]:

* ENTER THE PARTITION SIZE (DEFAULT=40000) [S]:

```
;
; THE DIAGNOSTIC TASKS ARE NORMALLY BUILT TO TRANSFER DATA VIA
; A 2000 OCTAL BYTE DATA BUFFER. YOU MAY SPECIFY A DIFFERENT
; BUFFER SIZE BY ANSWERING THE NEXT QUESTION.
```

* ENTER THE BUFFER SIZE IN OCTAL BYTES (DEFAULT=2000) [S]:

```
;
; NORMALLY DIAGNOSTIC TASK BUILD MAPS ARE NOT REQUIRED.
; IN THE UNLIKELY EVENT YOU NEED THEM, ANSWER "YES" TO THE
; FOLLOWING QUESTION.
```

* DO YOU WANT TASK BUILD MAPS? [Y/N]:

* DO YOU WANT THE MAPS LISTED ON THE LINEPRINTER? [Y/N]:

SYSGEN DIALOGUE DETAILS

If you answered Y to the first question and N to the second of the two questions above, the maps will be directed to UFD [1,3x] on the output disk.

;
; NORMALLY YOU ENTER EACH DIAGNOSTIC NAME REQUIRED FOR YOUR SYSTEM.
; AN ALTERNATE METHOD IS PROVIDED WHICH ALLOWS BUILDING ALL
; AVAILABLE DIAGNOSTICS. THIS METHOD REQUIRES ABOUT 500 BLOCKS OF
; DISK SPACE ON THE OUTPUT DEVICE. THE DIAGNOSTICS THAT DO NOT APPLY
; CAN BE DELETED AT A LATER TIME.
;
* DO YOU WANT TO BUILD ALL AVAILABLE DIAGNOSTICS? [Y/N]:
* HAVE ALL QUESTIONS BEEN ANSWERED TO YOUR SATISFACTION? [Y/N]:

If you answered these questions with N, processing will restart at the beginning of BLDUMD. Otherwise, if you want to build all diagnostics, the next section that asks for diagnostic names is bypassed.

;
; ENTER THE NAME OF THE DIAGNOSTIC TASKS TO BUILD, ONE AT
; A TIME. WHEN DONE, ENTER A SINGLE CARRIAGE RETURN.
;
; THE FOLLOWING IS A LIST OF VALID DIAGNOSTIC NAMES:
; RP04,RP05,RP06,RF11,RK05,RK06,RP02,RP03,RPR02,RS03
; RS04,TU56,TU16,TU45,TU10,TS03,TERM
;
; HERE IS A SAMPLE DIALOGUE TO BUILD THE RJP04/RWP04 DISK AND THE
; TMail/TS03 MAGTAPE DIAGNOSTICS (<CR> = CARRIAGE RETURN) :

;
; NAME [S]:RP04<CR> RP06 <CR>
; NAME [S]:TS03<CR> TU16 <CR>
; NAME [S]:<CR> TERM <CR>
; <CR>

The next question requires as a response, the name of the next diagnostic to build, out of the list shown above.

* NAME [S]:

If an invalid name is entered (for example "XX"), the following message is displayed, and the question is repeated.

;***** "XX" DIAGNOSTIC IS NOT AVAILABLE*****

The question "* NAME [S]:" is repeated to allow you to enter the names of all diagnostics to be built. When done, answer with a single carriage return.

If you chose to build all the diagnostics, or when you have entered the names of all the desired diagnostics, processing continues here.

;
; NOW WE TASK BUILD THE SELECTED DIAGNOSTICS
;
INS \$BIGTKB
TKB @UMDBLD

The command above builds the selected diagnostics, according to specifications defined by the previous sections.

SYSGEN DIALOGUE DETAILS

REM TKB

End of UMDBLD.

The following sample dialogue builds diagnostics for RK05, TU16, and terminals to run on an unmapped system. The GEN partition in that system starts at 50000. The task image files are directed to the target system disk which is put in drive DK1:.

```
>@[200,200]BLDUMD
>;
>; BLDUMD <VERSION 03.1>
>;
>; COPYRIGHT (C) 1976, 1977
>; DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
>;
>; BUILD ALL OR SELECTED USER MODE DIAGNOSTICS.
>;
>* ARE YOU RUNNING ON A MACHINE WITH AT LEAST 24K WORDS? [Y/N]:Y
>* DO YOU HAVE THE DUAL RK05 DISTRIBUTION KIT? [Y/N]:
>* IS THE CURRENT SYSTEM DISK AN RP02/03/04/05/06 OR RK06? [Y/N]: Y
>* DO YOU WANT EXPANDED COMMENTS FOR THE UMD BUILD PROCEDURE? [Y/N]:
>* DO YOU WANT DIAGNOSTICS FOR A MAPPED SYSTEM? [Y/N]:
>SET /UIC=[1,20]
>* DO YOU WANT THE DIAGNOSTICS STORED ON ANOTHER DISK? [Y/N]:Y
>* ENTER THE OUTPUT DEVICE NAME AND UNIT NUMBER (E.G. DK1) [S]: DK1
>;
>; THE COMMAND BUILD FILE WILL NOW PAUSE WHILE YOU MOUNT DK1:
>; YOU MUST CREATE THE UPD'S [1,30] AND [1,50] ON THE DISK
>; (THE FORMER ONLY IF YOU WANT THE TASK BUILD MAPS) IF THEY
>; DO NOT ALREADY EXIST.
>;
AT. -- PAUSING. TO CONTINUE TYPE "RES ...AT"
>MOU DK1:UNMOBJ
>RES ...AT
AT. -- CONTINUING
>
>* DO YOU WANT TO ALTER THE DEFAULT PARTITION ATTRIBUTES? [Y/N]:Y
>* ENTER THE PARTITION NAME (DEFAULT=GEN) [S]:
>* ENTER THE PARTITION BASE ADDRESS (DEFAULT=40000) [S]: 50000
>* ENTER THE PARTITION SIZE (DEFAULT=40000) [S]:
>* ENTER THE BUFFER SIZE IN OCTAL BYTES (DEFAULT=2000) [S]:
>* DO YOU WANT TASK BULD MAPS? [Y/N]:
>* DO YOU WANT TO BUILD ALL AVAILABLE DIAGNOSTICS? [Y/N]:
>* HAVE ALL QUESTIONS BEEN ANSWERED TO YOUR SATISFACTION? [Y/N]:Y
>;
>; ENTER THE NAME OF THE DIAGNOSTIC TASKS TO BUILD, ONE AT
>; A TIME. WHEN DONE, ENTER A SINGLE CARRIAGE RETURN.
>;
>* NAME [S]: RK05
>* NAME [S]: TU16
>* NAME [S]: TERM
>* NAME [S]:
>;
>; NOW WE TASK BUILD THE SELECTED DIAGNOSTICS
>;
>TKB @UMDBLD
>;
>@ <EOF>
>
```

SYSGEN DIALOGUE DETAILS

3.7 SGN ERROR MESSAGES

The System Generation files issue a message whenever an error in the response to a query is detected. These messages are listed below in alphabetical order. Most messages apply to a number of queries. Those which are specific to a single query are so noted in the explanatory text following the message.

Each message is preceded by *DIAG*--

ILLEGAL VECTOR ADDRESS

The numeric value entered was not on a double word boundary (the last digit was not 0 or 4).

Determine the correct vector address and reenter the value.

INVALID ANSWER

The response to the number of clock interrupts is not evenly divisible into 10,000(10).

Enter a clock rate that evenly divides into 10,000(10).

MODULE xx IS ALREADY IN USE

The specified ICR/ICS or UDC11 module number was used previously.

Reenter the correct module number.

MODULES GREATER THAN 252.

The highest module number for the UDC11 is 252(10).

Reenter the correct module number.

OVERLAPPING MODULES

The ranges specified for the UDC11 modules have at least one overlapping specification.

Check the module range specifications and reenter the correct values.

RSX-11M/S DOES NOT SUPPORT MIXED MASSBUS DEVICES

Only one type of device is allowed on a single MASSBUS controller.

Review your configuration requirements and specify only one device type per MASSBUS controller.

SYSGEN DIALOGUE DETAILS

VECTOR ALREADY IN USE

In the specification of vector addresses, one of the following conditions occurred:

- two resident drivers have duplicate vector address values
- a resident driver and a loadable driver have duplicate vector address values
- a loadable driver and a resident driver have duplicate vector address values

Reenter the correct vector address value.



CHAPTER 4

GENERATING LARGER SYSTEMS

Most of the features discussed in this chapter are intended for use in larger systems. However, some of the features discussed are also extremely useful in obtaining increased flexibility from a small system. Potentially useful in small systems are features such as disk swapping, checkpointing during terminal input, dynamic checkpoint space allocation, and the ACP-Executive interface.

4.1 DEFINING MEMORY PARTITIONS

In a 16K system, you must observe the partition boundaries defined in the Baseline System. Specifically, SYSPAR starts at 30100(8), and GEN starts at 40000(8). The two partitions DSKPAR and SECPAR are partitions for loadable drivers. The system disk driver resides in DSKPAR, and various secondary storage device drivers as well as the line printer driver are loaded into SECPAR. This configuration allows the SYSGEN procedure to be performed on all supported hardware configurations. On a 16K system, you can alter the use of the space dedicated to DSKPAR and SECPAR by building resident drivers instead of loadable drivers, but this may not be done with SYSPAR and GEN. If the system has more than 16K, you have the option of considering a different partition layout. The consequences of this flexibility depend on the size of the user-tailored Executive and whether the system is mapped or unmapped.

4.1.1 Laying Out Partitions - Software Options

Given the case of having more than 16K of memory (this usually means memory in at least 8K multiples), you should be aware of certain DIGITAL-supplied software options before laying out partitions. These options are described below:

- A. There are two versions of the Task Builder and MACRO-11. The standard versions operate with 8K of memory. The larger versions (named BIGTKB and BIGMAC) require a 14K partition, but run considerably faster than the standard versions. In addition, BIGMAC supports the floating point instruction set and storage allocation assembler directives. BIGTKB is required for rebuilding the Task Builder itself. BIGMAC is built by the command file BIGMACBLD.CMD, and BIGTKB is built by the command file BIGTKBBLD.CMD. In addition, if the EXTEND TASK directive is generated for the target system and BIGMAC and BIGTKB are installed in a system controlled partition, both use this feature and extend themselves up to the limit (set by the MCR SET /MAXEXT command) to keep their symbol tables memory resident. If this Executive option is

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not included, both tasks still benefit from being installed in partitions larger than 14K.

- B. The Files-11 ACP (F11ACP) is available in three versions. The first (FCPNMH.TSK) requires 2K of memory and does not support multi-header files or RMS record-locking. The second version (FCP.TSK) supports multi-header files and RMS but requires 2.5K of memory. The third version (BIGFCP.TSK) supports RMS and multi-header files and operates two to three times faster than the smaller version. The minimum size of BIGFCP is 4.5K plus 32 words (22100 octal); however, the standard task-build command file, BIGFCPBLD.COMD, specifies options that increase the memory requirements to 5.5K.
- C. MCR, F11ACP, and TKTN share a partition in a minimum 16K system. If more memory is available, you should consider dedicating a partition to FCP. Depending on the characteristics of the software applications, substantial throughput improvements are possible.

If large disks are being used (RP02/03/04/05/06 or RK06) the system can benefit from the use of more than one file system. Install as many copies of F11ACP as there are disks and mount each disk with its own copy by specifying the /ACP switch on the MOUNT command.

When you generate a system in which MCR shares SYSPAR with the file system (F11ACP), it is important that you build the tasks with a partition size that properly reflects the SYSPAR to be used. This requirement is necessary because the tasks are checkpointable and have checkpoint space allocated in their task image files.

In a standard system where MCR and FCPNMH both reside in a SYSPAR that is 7700(8) bytes long, there is no problem. If, however, the multiheader file system FCP is used, SYSPAR must be increased to 10500(8) bytes. As a result, you must modify the MCR task-build command file to reflect the new partition size.

An alternative approach on a mapped system is to define SYSPAR to be a system-controlled partition. Thus, MCR would not map to the entire partition, but only to the 7700(8) bytes it requires. This has the side-effect of requiring additional Executive dynamic memory. A PCB is permanently allocated for MCR because it always remains active; a PCB is allocated for FCP as long as it remains active (such as when a device is mounted).

NOTE

If SYSPAR is system controlled, the shuffler task, SHF, must not be installed in it.

- D. The tasks AT., CRF, EDI, LBR, MAC, PIP, TKB, and VFY determine the size of the partition in which they are executing, and make use of any additional space for symbol table or additional buffer storage. Thus, they benefit from being installed in a partition larger than 8K. Similarly, BIGTKB and BIGMAC benefit if they are installed in a partition larger than 14K. If, during a task-build, assembly, or library operation, the condition of insufficient

GENERATING LARGER SYSTEMS

dynamic memory is reported, the symbol table space must be expanded by using a larger partition. If these tasks are installed in a system-controlled partition, the amount of space allocated to them can be adjusted using the /INC keyword on the INSTALL command. If the /INC keyword is omitted the tasks occupy 8K; BIGMAC and BIGTKB occupy 14K.

- k
ks
- E. You can generate a multi-user system if enough memory exists to support more than one system task at a time. A multi-user system has several terminals that can be used simultaneously for program development or running other tasks. Given enough memory and a suitable processor, RSX-11M can satisfactorily support from 2 to 24 or more users who are editing, compiling, task-building, debugging, and running production tasks.
- ckp
dit
- F. You can generate multi-user protection for the system. This feature provides protection for the system and users from destructive interference by others. It limits system access to users whose identification codes have been put into an account file by the system administrator. The availability of numerous Executive directives is limited for nonprivileged users, thus preventing destructive interference. Furthermore, certain MCR commands are absolutely privileged, whereas others, which are normally privileged, may be issued by nonprivileged users for initializing, mounting, and dismounting private volumes.
- (2
- G. You can split MCR into two cooperating tasks, MCRMU and SYS. MCRMU is the command dispatcher and executes only a few commands; SYS processes all the remaining commands normally provided by the task MCR. In addition, MCRMU initiates several copies of SYS as needed to process simultaneous requests from multiple terminals.
- cut
tit
- H. There are a number of optional tasks that are not supplied in task-image format, but they add considerable usefulness to the system. The tasks HEL, BYE, and ACNT are required to support multi-user protection systems. BRO and SHUTUP (neither of which require multiuser resources) broadcast messages and shut down the system. PSE, SYE, ERL, and ERF are the tasks which support the error logging features of the Executive. MTAACP and F11MSG supply ANSI format magtape support. The task SHF reallocates memory in system-controlled partitions when requested by the Executive. ACS allocates dynamic checkpoint files for the Executive. PRT is the print spooler that overlaps task execution with printing of files. These all require an 8K (or less) user-controlled partition or a system-controlled partition. FTB is a fast task builder which requires 20K and builds nonoverlaid tasks up to 3-4 times faster than BIGTKB. DSC is the disk save and compress utility that, in task form, requires 14K.
- orit
- I. TKTN ideally runs in a partition in which all tasks are either checkpointable or execute quickly. In the minimum 16K configuration, TKTN shares SYSPAR with MCR and FCPNMH. In this configuration the following situation can occur. A TAS command can be issued with TI: directed to the line printer. If the line printer is offline, TKTN cannot get into memory to print the device-offline message. The result is that the TAS listing does not occur, the printer-not-ready messages do not occur, and the pool can eventually become exhausted by the messages queued to TKTN.

4.1.3 Memory Compaction in a System-Controlled Partition (Shuffler)

The shuffler's algorithm consists of two passes through the system-controlled partition; the steps in each pass are executed iteratively until the partition reaches a stable state.

4.1.3.1 The Shuffler's First Pass - In the first pass, the shuffler starts at the beginning of the system-controlled partition and tries to move (shuffle) all tasks that are sitting above a gap of free space down to the base of the free space. When possible, it also checkpoints any tasks that it encounters, which are waiting for terminal input. Task shuffling occurs in the following steps:

1. The task is blocked from further execution and the shuffler allocates the free space below the task.
2. If necessary, the shuffler waits for the task's outstanding I/O count to reach zero by checking it at intervals of approximately one-eighth of a second. If the task I/O count does not drop to zero in about a half of a second, the shuffler marks the task's partition as having long-outstanding I/O, deallocates the free space below the task, and restarts its first-pass scan of the partition. The Executive clears the task's partition long-outstanding I/O indicator when it reduces the task's I/O count to zero.
3. If the task's I/O count drops to zero within a half of a second, the shuffler moves the task down to the base of the free space. The speed of this move increases if the QIO speed optimizations were included during phase 1 of SYSGEN and a large BLXIO transfer vector was allocated.
4. After the move is complete, the task is unblocked to allow further execution and the free space (now above the task) is deallocated.

When the shuffler has completed its first pass, all free space in the partition has been merged into one hole at the top partition. But, there may be additional holes below tasks which cannot be shuffled.

4.1.3.2 The Shuffler's Second Pass - If the shuffler completes its first pass and some tasks still are actively competing for memory in the partition, the shuffler executes its second pass algorithm. In the second pass, the shuffler creates an ascending, priority-ordered list of the tasks in the partition. It then uses this list to determine if the size of the waiting task is less than the sum of the free space in the partition and the size of one or more of the (lower priority) tasks that may be checkpointed. If the waiting task's size is less than this sum, the lower priority tasks are checkpointed. The shuffler then restarts its first-pass algorithm to accumulate the freed-up space and allocate it to the waiting task. If tasks that cannot be shuffled fragment the system-controlled partition, the second-pass algorithm is executed once for each fragment of the partition.

If the shuffler completes its second pass without finding space for the waiting task, it searches for the next system-controlled partition in the system and exits if there are none.

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When the shuffler is active but not actually executing, i.e., waiting for task I/O or a checkpoint operation to complete, it places itself in a state in which it may be checkpointed by any task. Therefore, the shuffler does efficiently share a partition with other tasks such as MCR or FllACP. However, for large systems the shuffler is more responsive when it is installed (and FIXED in memory) in a dedicated partition. Note that the shuffler requires less than .5K words of memory. The shuffler should never be installed in a system-controlled partition.

RSX-11M's philosophy of checkpointing in system-controlled partitions avoids preempting memory unless it can actually be used. No lower priority task is checkpointed unless it is known beforehand that enough contiguous space can be made available to load the higher priority task. The one exception is a checkpointable task waiting for terminal input. It is swapped out unconditionally to make room for other tasks whenever the shuffler is activated. It is not brought back in until the terminal input request is completed.

4.1.3.3 Unshufflable Tasks - Tasks that have been FIXED in memory can be shuffled. However, the following occupants of a system-controlled partition cannot be shuffled and cause free space to be fragmented in the partition.

1. Loaded device drivers.
2. Tasks that are connected to the ICS/ICR-11 or UDC-11 drivers.
3. A task whose partition was previously marked by the shuffler as having a long-outstanding I/O and whose I/O count has yet to drop to zero. Typical extreme examples of this case are tasks that issued terminal reads and cannot be checkpointed, LPAll or tasks that have synchronous functions being serviced by the AR11, LPS11, or tasks using the Connect to Interrupt Vector directive.
4. Tasks that have been aborted and fixed by the Executive for a memory parity error.
5. Dynamically-created common regions.

4.1.4 Advantages of System-Controlled Partitions

System-controlled partitions are especially useful in multi-user systems. By installing all the user tasks in a system-controlled partition, the Executive allocates space as needed. One user can be running an 8K task, such as PIP, while another user is running a larger task, such as BIGTKB; neither user needs a dedicated partition. In essence, the memory allocation of the system adapts itself to meet its user's requirements.

If a system-controlled partition is the last real memory partition in the system (not including device partitions), the partition's size will be altered dynamically at bootstrap time to reflect the actual amount of memory from the beginning of the partition to the end of physical memory.

Thus, if a system is bootstrapped on a processor having more or less memory than that recorded in the system image, the partition will be adjusted to the proper size. As a result, a system generation is not

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required to make use of memory that may be added to a configuration in the future.

4.1.5 Unmapped System - Executive Less Than 8K

All system tasks for an unmapped system run at specific physical memory addresses and must be rebuilt if they are to run elsewhere. The tasks distributed on the release disks fall into two classes:

1. Those built to run at 30100(8) (SYSPAR partition)
2. Those built to run at 40000(8) (GEN partition)

If, after the creation of the user-tailored Executive, \$SYTOP exceeds 30100(8), but is less than 40000(8), move the SYSPAR partition to avoid rebuilding all of the utility tasks. As a result only the task-build command files for MCR, FCPNMH, and TKTN need to be edited. Figure 4-1 depicts a suggested layout for a 24K system where \$SYTOP lies between 30100(8) and 40000(8).

One way to avoid moving SYSPAR is to generate loadable driver support into the system. Loadable driver support requires less than ten words in an unmapped Executive. However, it allows you to build a selected number of loadable drivers in partitions above GEN, reducing the size of the Executive.

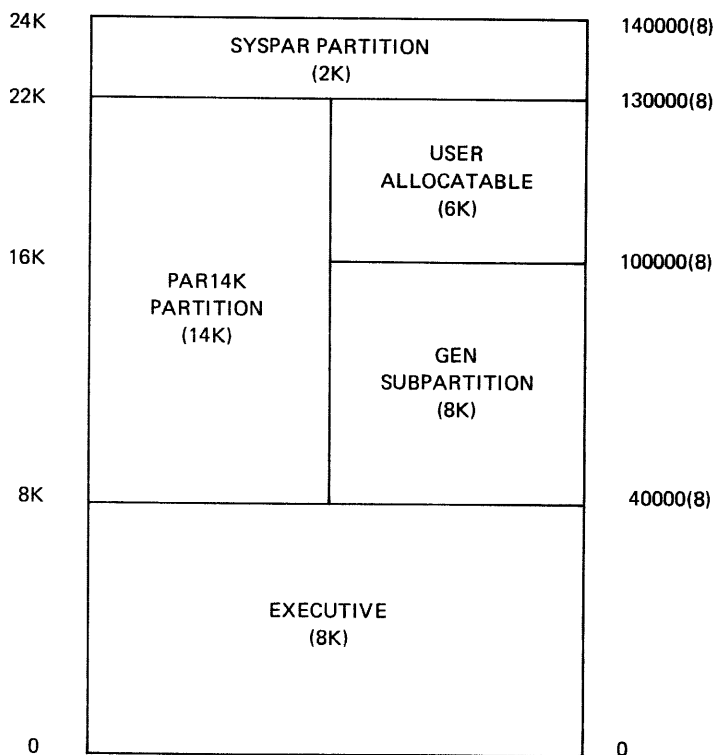


Figure 4-1 Typical Unmapped 24K System

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Figure 4-1 shows that SYSPAR was moved from its location in the baseline system (refer to Figure 2-1). Moving SYSPAR requires the editing of the task-build command files for MCR, FCPNMH, and TKN. The partition PAR14K is now a real partition (rather than a pseudo partition, as was the case in a 16K system) and is correctly placed to run BIGMAC and BIGTKB without rebuilding them. Furthermore, because GEN has not been moved, tasks running in GEN do not need to be rebuilt. Finally, a 6K subpartition is available in PAR14K. You are free to divide this 6K memory block into any configuration of subpartitions that meets local requirements.

Figure 4-2 illustrates a suggested 28K unmapped system. It is identical to Figure 4-1 in its allocation of the 0-24K block of memory. The additional 4K is allocated to main partition PMDPAR that PMD uses. Also, the print spooler can use a 2K subpartition, SPLPAR, leaving an additional 2K to suit your requirements.

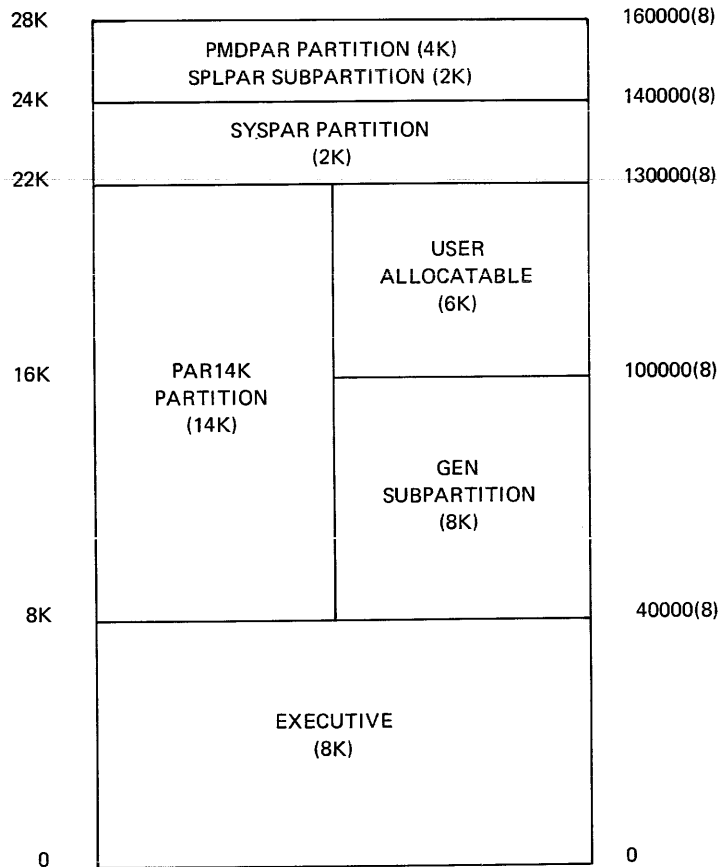


Figure 4-2 Typical Unmapped 28K System

Both of these layouts are attempts to balance SYSGEN requirements with known system software requirements. Local requirements may dictate an alternative scheme. The following system requirements for unmapped systems should, however, be considered:

1. Most DIGITAL nonprivileged software requires an 8K partition. This software assumes that its name is GEN and that it starts at 40000(8).

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2. MCR, FCPNMH, and TKN require a 2K partition. These tasks assume that its name is SYSPAR and that it starts at 30100(8).
3. BIGTKB and BIGMAC require 14K. These tasks assume that the partition is named PAR14K and that it starts at 40000(8).

Changing a starting address requires editing the task-build command files and rebuilding the involved tasks.

Changing the partition's name does not require a rebuild, because the INSTALL command allows you to specify the partition name. However, the base addresses of the new partition and that for which the task was built must be the same.

4.1.6 Unmapped System - Executive Greater Than 8K

If the value of \$SYTOP exceeds 40000(8) on an unmapped system, all privileged and nonprivileged system tasks must be rebuilt. Because TKB must be rebuilt with BIGTKB, a 24K system is, in general, the minimum system for a user-tailored Executive that exceeds 8K.* The layout of partitions becomes a user responsibility, limited only by the stated requirements for system software and application performance goals. Note however, that loadable driver support could reduce the size of the Executive to below 8K.

4.1.7 Mapped Systems

The minimum memory size for a mapped system is 24K. You need not rebuild nonprivileged tasks in a mapped system when physical partition boundaries move. This is true because nonprivileged tasks on a mapped system run at a virtual base address of zero, rather than at a physical base address. Thus, the value of \$SYTOP is much less critical in a mapped system.

You must always rebuild privileged tasks, as with an unmapped system, because they are linked to the Executive symbol table file. You must rebuild nonprivileged tasks only if you change any of the task's attributes such as checkpointability. The Task Builder establishes the attributes when building a task. Consult the RSX-11M Task Builder Reference Manual for a comprehensive discussion of task attributes and associated Task Builder switches.

4.1.8 Example of a Large Mapped System

To realize the highest throughput for a large mapped system, there are a number of configuration options which must be considered. The example addresses a system with the following hardware:

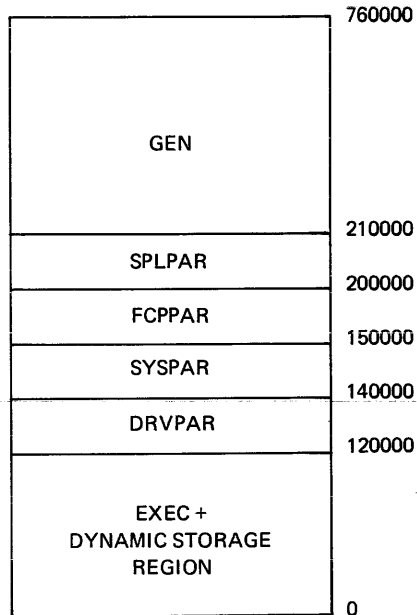
- PDP-11/45 with 124K of memory
- 2 RS04 fixed head disks
- 2 RK05 disks
- 2 RP06 disks

* New systems exist in multiples of 8K, 16K, and 32K memory stacks. Existing systems of 20K could support a user-tailored Executive which exceeded 8K.

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2 TU16 magtape drives
2 TU56 DEctape drives
1 DH11 with 4 remote lines and 12 local lines
1 LP11 printer
1 DL11-A line interface

The following partition layout may be used



DRVPAR is a 4K, system-controlled partition for loadable drivers; this is sufficient for loading all of the device drivers including the terminal driver. SYSPAR is a 2K partition for MCRMU, TKTN, and the shuffler. FCPPAR is a 6K partition for the primary BIGFCP; this is sufficient to allocate approximately 50 file control blocks (FCBs). SPLPAR is a 2K partition for the print spooler. All other tasks run in the system-controlled GEN partition. For increased throughput, a second copy of BIGFCP is installed in GEN to service the second RP06. In addition to providing overlapped operations, this allows FCBs for files accessed on the second RP06 to be stored in the second task image. A third version of the file system should be built and installed with the name DTAACP if you want Files-11 DEctape processing. This version should be the 2K, non-multiheader FCPNMH.

Primary checkpoint space of 1024 blocks is allocated on an RS04 fixed-head disk and secondary space of 2048 blocks is allocated on the first RP06. Under control of the startup file [1,2]STARTUP.CMD, all utility tasks (e.g., BIGMAC, BIGTKB, PIP, EDI, SLP etc.) are copied to an RS04 and the work files for BIGTKB, BIGMAC, and CRF (LUN 8) are assigned to the second RS04. This increases system throughput by providing faster overlay and work file processing.

4.2 BUILDING SYSTEMS FOR RESIDENCE ON OTHER DEVICES

An RSX-11M system can reside on any file-structured device. Thus, in addition to the RK05, RP02, RP03, RP04, RP05, RP06, and RK06 disks, the system may reside on the RF11, RS03/RS04, or RX01 disks, or on DEctape. Because the system, including all privileged and

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nonprivileged tasks, requires approximately 2200 blocks of storage, use of the alternate devices requires careful examination and planning.

It is fairly easy to put a system on another device. The steps are:

1. Format the disk, if necessary.
2. Initialize the disk as a Files-11 volume.
3. Mount the disk and establish the following directories on it:
[1,1], [1,2], [1,4], [1,6], and [1,50] or [1,54]
4. Transfer all files in [1,1], [1,2], and [1,50] or [1,54] from the system disk to the target device, as shown below:

```
>SET /UIC=[1,1]
>PIP DS0:=DK0:*. *
>PIP DS0:[1,2]=DK0:[1,2]*.*
>PIP DS0:[1,50]=DK0:[1,50]*.*
```
5. If the Executive in the system image file RSX11M.SYS, contains installed tasks, create a new system image file by copying the Executive task image contained in RSX11M.TSK. (Thus, in SYSGEN2 you should specify that the Executive backup file be retained.) Follow the procedure used in SYSGEN2 to ensure that the resulting file is contiguous and is sufficiently long.

NOTE

The target system Executive must include support for the device on which it is to reside; otherwise the device driver will not be available to load tasks.

6. Using the MCR ASN command, create the logical device names LB: and SY: and assign them to the target disk, as follows:

```
>ASN DS0:=SY:
>ASN DS0:=LB:
```
7. Run VMR to set up the partitions and install the required tasks. Note that all tasks must be installed from device LB:.
8. Bootstrap the new system and save it with the /WB switch to rewrite the bootstrap block.

```
>BOO DS:[1,50]
RSX-11M V03.1 BL22
>SAV /WB
```

4.3 SUPPORTING MORE THAN ONE SYSTEM ON THE SAME VOLUME

Supporting more than one system on the same device is fairly straightforward. Create a separate directory for the new system, such as [2,50] or [2,54].

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1. Copy (or rename) all files from [1,50] or [1,54] to the new directory. Note that tasks may not be installed in two systems at the same time; therefore, all tasks to be installed concurrently in both systems must have separate task images.
2. Create the file RSX11M.SYS from the RSX11M.TSK file.
3. Run VMR, set up partitions, and install tasks.
4. Bootstrap the system and save it (specifying the /WB switch to write a new bootstrap block, if desired).

There are now two systems on the same volume. If the install-run-and-remove option of the RUN command is to work properly, the default UIC for the task image (specified by \$ in RUN \$xxx) must be set up for the proper UIC. This may be done with the SET /SYSUIC command as in SET /SYSUIC=[2,54].

EXAMPLE:

```
>UFD SY:[2,54]
>SET /UIC=[2,54]
>PIP =[1,54]
>PIP RSX11M.SYS;*/DE
>PIP RSX11M.SYS=RSX11M.TSK
>VMR
ENTER FILENAME: RSX11M
VMR>SET /POOL=400
VMR>SET /MAIN=SYSPAR:400:100:TASK
VMR>SET /MAIN=GEN:500:1100:SYS
VMR>INS FCP
VMR>INS INS
VMR>INS MCR
VMR>INS MOU
VMR>INS SAV
VMR>^Z
>BOO

RSX11M V03.1 BL22
>SET /SYSUIC=[2,54]
>SAV

RSX11M V03.1 BL22 64K MAPPED
>RED DK0:=LB0:
>RED DK0:=SY0:
>MOU DK0:SYSTEM
>@[1,2]STARTUP
><EOF>
```

If disk space is limited, you may alter step 1 above to include only those tasks that are to be statically installed in one or both systems. Typically this means that only one copy of each nonprivileged user task is maintained. These utility tasks may then either be installed by the STARTUP file or always initiated using RUN \$XXX. In this case, if Executives are identical, or no drivers are to be loaded on-line, the system UIC should be the same for both systems.

4.4 INCREASING FILE SYSTEM THROUGHPUT

4.4.1 Building a Faster File System

As distributed, the SYSGEN command files build a 2K, 2.5K, or 5.5K file system. The 5.5K file system is two to three times faster than the smaller versions for certain operations. However, increased speed in directory operations is possible by increasing the number of directory blocks read in at one time. This may become important on large disks, such as the RP02, RP03, RP04, RP05, RP06, RM03, and RK06.

To increase or decrease the number of directory blocks read in at one time, you must edit the file BIGFCPBLD.CMD. The size of BIGFCP can be reduced to 5K by eliminating the additional buffers allocated to directory blocks, or it may be increased by .25K for each additional block. The program section containing the extended directory buffers is \$\$BUF3. To reduce the size of BIGFCP to 5K, delete the line:

```
EXTSCT=$$BUF3:2000
```

To increase the number of blocks read, edit the line to increase the PSECT by the number of additional bytes to be read. Keep in mind that directory blocks are read in multiples of 1000(8) bytes; thus, the PSECT should be altered only by increments of 1000(8). For example, the statement:

```
EXTSCT=$$BUF3:5000
```

allocates buffer space for five additional blocks permitting up to six directory blocks to be read at a time.

NOTE

The file system task should not share a user-partition with any task that performs file-structured I/O. Any other configuration will cause a malfunction of the RSX-11M system. The operation of RSX-11M is heavily dependent on the file system. Nearly all tasks request processing from it. Thus, for a system to operate properly, the file system must be in a partition where it can react promptly. Most tasks request an I/O operation through FllACP, and while this I/O operation is in progress, the tasks cannot be checkpointed. Thus, if FllACP is running in the same partition, it may not be loaded into memory to process the request.

4.4.2 File Control Primitives Dynamic Memory Requirements

4.4.2.1 Directory Least-Recently-Used List - A special feature of the file control primitive (FllACP) task improves the performance of directory operations. However, as many as 54 (decimal) words of dynamic memory may be required for each mounted volume.

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This feature allows directories to be pre-accessed, as follows: the first time a directory operation is performed on a given directory (master file directory or user file directory), the directory is accessed. An 18-word file control block (FCB) is stored in the directory least-recently-used (LRU) list. The LRU list is actually a thread through the FCB list pointed to by the volume control block.

Pre-accessing directories in this way generally saves three disk accesses for every directory operation. The search of the master file directory for the identification of the user file directory is bypassed completely, thus eliminating the read of the MFD file header and MFD data block. Pre-accessing the user file directory also eliminates reading the UFD's file header.

The dynamic memory needed to include this time saving feature may be intolerable for users with limited dynamic memory, because up to three 18-word LRU entries may be required for each mounted volume. The maximum number of directory LRU-list entries that FCP uses is set when the volume is initialized by the /LRU keyword; the default is 3. The LRU value can be overridden when the volume is mounted.

4.4.2.2 File Control Block Allocation - For each open file in the system, a 50(8) byte File Control Block (FCB) is required. The file system uses this control block to maintain critical information about the file. In the 2K FCPNMH and 2.5K FCP, FCBs are allocated from the Executive's dynamic storage region. However, in the 5.5K BIGFCP, FCBs may be allocated from space within FCP's partition before overflowing into the dynamic storage region. PSECT \$\$FRE1 controls the amount of memory allocated to FCBs, which is extended in the build command file BIGFCPBLD.COMD. This feature is especially important for large, multi-user systems because it reduces the load on the dynamic storage region.

4.4.3 Multiple File Systems

For systems with several high-performance disks it is possible to increase file system throughput by mounting each volume with a separate FllACP. This allows a separate pool of FCBs for each disk volume (in each FllACP partition), and allows overlapping of directory requests on each volume.

If Files-11 support for DECTape is desired, a separate FllACP should be installed with the name DTAACP, the primary default file system ACP for mounted DECTapes. This version of FllACP should be the smallest (2K) file system that does not support multi-header files (FCPNMH.TSK).

4.5 INSTALLING AND USING RESIDENT LIBRARIES AND COMMON BLOCKS

RSX-11M supports resident libraries and common blocks which may be shared by several tasks. Resident libraries and common blocks must be installed in common partitions.

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4.5.1 Setting up a Common Partition

Establish a common partition by using the MCR SET command specifying the partition type COM. For example, the following command:

```
>SET /MAIN=FORRES:1000:300:COM
```

sets up a main common partition named FORRES, starting at 100000, that is 30000 bytes long.

To eliminate a common partition, use the SET /NOMAIN or SET /NOSUB command.

4.5.2 Installing a Library or Common Block

Both the task and symbol table files (.TSK and .STB) must be stored under UIC [1,1] on device LB:. Tasks using the common block or resident library must specify its name during task-build. You must install the common block or library before you install a task referencing the library or common block. This is done with the MCR INSTALL command, as shown below:

```
>INS [1,1]FORRES/PAR=FORRES
```

This command causes the library or common block to be loaded into the partition. Note that this is special case processing by Install. Normally, Install only creates Task Control Blocks (TCBs) for tasks without reading executable code. For a common block or library, the common block or library is read into memory. You can then install tasks that reference the library or common block.

4.5.3 Eliminating a Library or Common Block

You can eliminate a common block or library only by using the MCR SET command. For example, the command:

```
>SET /NOMAIN=FORRES
```

eliminates the library FORRES (installed as shown in Section 4.5.2) and the partition FORRES. Use care when eliminating a library or common block to remove any tasks that reference it before eliminating the library.

4.6 BUILDING A FORTRAN OTS RESIDENT LIBRARY

To save memory space, you may want to build a resident (sharable) library containing frequently-used FORTRAN routines.

A MACRO-11 source file that aids you in building a resident FORTRAN library is distributed with RSX-11M. This file, named FORRES.MAC, is under UIC [200,200] on the system disk (on the RK05 kits, the mapped and unmapped object disks). As distributed, this module generates an 8K library for a system with no extended arithmetic support.

While it is not necessary to build the resident library during system generation, memory space for it should be considered at that time. Otherwise, it may be difficult to install the library.

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Building an optimal resident library is an iterative process. The file FORRES.MAC must be edited with consideration for size and program requirements.

For most efficient use of virtual memory, the library should be as close as possible to a 4K boundary, without exceeding that boundary.

The following steps are a guide to tailoring the FORTRAN library to individual system requirements. This process assumes that a system generation has already been done, that all tasks are installed, and that the system has been saved.

1. For easy reference to the MACRO-11 file, a listing of FORRES.MAC may be useful:

```
>SET /UIC=[200,200]
>PIP LP:=FORRES.MAC
```

2. Edit the MACRO-11 file to insert or remove entry points as needed.

3. Assemble the MACRO-11 file:

```
>MAC FORRES,LP:=FORRES
```

4. Task-build the object file, specifying the /-HD and /-PI switches on the symbol table file. The only Task Builder option required is STACK=0. The appropriate command sequence is shown below:

```
TKB>,LP:,SY:FORRES/-HD/-PI=FORRES
TKB>/
ENTER OPTIONS:
TKB>STACK=0
TKB>//
```

5. Examine the Task Builder map to obtain the size of the library (in octal bytes), as shown in the line R/W MEM LIMITS:. If the library does not fit into the partition planned for it, examine the rest of the map to obtain the sizes of individual modules. Remember that the library should be as close as possible to a 4K boundary, without exceeding that boundary.

If the size of the library is not correct, repeat steps 2 through 5.

6. When the library is the desired size, task-build it in UIC [1,1], specifying all output files. In addition to the STACK option, you must use the PAR option, as shown below:

```
>SET /UIC=[1,1]
>TKB
TKB>FORRES,LP:,SY:FORRES/-HD/-PI=[200,200]FORRES
TKB>/
ENTER OPTIONS:
TKB>STACK=0
TKB>PAR=FORRES:base:length
TKB>//
```

The base address for FORRES should be set as high as possible for a mapped system. (For example, if the size of the library is greater than 4K but less than 8K, the base address should be set to 140000.) For an unmapped system, it is the

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actual common block base address. The size of the partition may be assumed to be 8K. After one task-build, a more accurate size can be given.

(If there is a FCS resident library available, the TKB option LIBR=FCSRES:RO may also be used.)

7. Allocate space for the library, as shown below:

```
>SET /MAIN=FORRES:base:length:COM
```

8. Install the library using the following command:

```
>INS FORRES
```

9. Now perform a SAVE, or edit the [1,2] STARTUP.CMD command file to install FORRES when the system is bootstrapped.

4.7 BUILDING AN FCS (POSITION-INDEPENDENT) RESIDENT LIBRARY

To save memory, you may want to produce a position-independent library containing all the FCS modules required by a set of programs that are intended to run simultaneously.

The MACRO-11 source file, [200,200] FCSRES.MAC, aids you in building an FCS resident library. As distributed, this file produces a 4K library and contains every module in FCS. If you want to produce a smaller version of FCSRES you must edit the FCSRES.MAC file, eliminating the .GLOBL references for those modules to be excluded.

It should be understood that the number of FCS modules that are included in a resident library is dependent upon the applications that require the FCS library. An essential point to consider is that a task that links to FCSRES cannot include missing FCS modules from the system object library, SYSLIB.OLB. Such a program cannot link with FCSRES; it must instead link all of FCS from SYSLIB.

To build FCSRES:

1. Edit the FCSRES.MAC file, if desired.
2. Assemble it, as shown below:

```
MAC>FCSRES,LP:=FCSRES
```

3. Task-build it with the following command sequence:

```
>SET /UIC=[1,1]
>TKB
TKB>FCSRES/-HD/PI,LP:.,SY:FCSRES=[200,200]FCSRES
TKB>/
ENTER OPTIONS:
TKB>STACK=0
TKB>PAR=FCSRES:base:size
TKB>//
```

The base address for FCSRES is always 0 for a mapped system. For an unmapped system, it is the actual common block base address. The size of the partition may be assumed to be 4K. After one task-build, a more accurate size can be given.

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4. Allocate space for the library, as shown below:

```
>SET /MAIN=FCSRES:1400:200:COM
```

This example creates a 4K common block (library) at physical address 140000.

5. Install the library using the following command:

```
>INS [1,1]FCSRES
```

6. Save the system or edit the [1,2] STARTUP.CMD command file to install FCSRES when the system is bootstrapped.

If a FORTRAN resident library is required in conjunction with an FCS resident library, first build FCSRES, then include the Task Builder option statement

```
LIBR=FCSRES:RO
```

in the task-build options for FORRES. This results in a considerably smaller FORRES. By properly tailoring the FORTRAN resident library, a flexible 4K FORRES using a 4K FCSRES can be built. In addition, this allows the use of FCSRES by itself when FORRES is not required.

4.8 PRINT SPOOLER (PRT)

A print spooler (PRT) task is provided that you can build to print listings simultaneously with the operation of other tasks. The MACRO-11 assembler, Task Builder, and FORTRAN compilers try to spool all listing or map files generated by them onto disk. If the print spooler is not installed, the files remain on disk. If the spooler is installed, it is started, thus printing any files in its receive list (input queue). Using the print spooler speeds up the operation of MACRO-11, the Task Builder, and compilers, because they do not have to wait for I/O to complete on the relatively slow (compared to disk) line printer.

For optimum operation, the print spooler should be installed in its own 2K partition. It may be built checkpointable or not checkpointable.

Under normal circumstances the spooler deletes only a small class of files after printing. However, it is possible for you to build a deleting print spooler. Do this by editing the task-build command file PRTBLD.CMD during SYSGEN phase 2. When the line text editor (EDI) prompts, enter the following commands:

```
*F GBLPAT=PRT:$DELET  
GBLPAT=PRT:$DELET:0  
*C/0/1  
GBLPAT=PRT:$DELET:1  
*EX
```

The spooler built without this patch deletes only the following files: *.PMD, *.DMP, LP.LST, and LP.MAP.

You may supply an alternative file deletion algorithm and include it in task PRT. The module should define the global entry point \$DELCK. The routine is called with register R0 containing the FDB of the file just printed. On return, R0 must be preserved and the processor status C-bit should be set to indicate that the file is to be deleted.

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Use of this feature bypasses all of PRT's default file deletion logic. To include this module, insert it in the object library PRT.OLB, and edit the task-build command file PRTBLD.CMD, deleting the following line:

```
GBLDEF=$DELCK:0
```

Before a file is printed, an identification page is generated. This page contains the RSX-11M version number; the date and time; and the device, UFD, and name of the file being printed. In addition, the file name is printed in large block letters for readability. Two formats are available, a large one for 132-column printers, and a smaller one for 80-column printers.

You may build PRT to omit the file identification page by modifying a global patch in the task-build command file as follows:

```
*F GBLPAT=PRT:$FLAG
GBLPAT=PRT:$FLAG:1
*C/1/0/
GBLPAT=PRT:$FLAG:0
```

Note that the value specified in the GBLPAT statement is used to determine the number of title pages printed. There are additional options for specifying flag page size and the number of trailing form feed characters to be printed. The task-build command file, PRTBLD.CMD, contains detailed commentary concerning these options.

4.9 BUILDING MULTI-USER SYSTEMS

RSX-11M can support more than one terminal that is running tasks. Such systems are called multi-user systems. Depending on the processor, disks, memory size, and job mix, RSX-11M can support from 2 to 24 or more users simultaneously.

4.9.1 Setting Up a Multi-User System

At system generation, more than one terminal should be generated for the system. These terminals may consist of any combination of DL11s, DJ11s, DH11s, or DZ11s. DH11s and DZ11s may have both local and remote lines.

The system manager has the choice of defining fixed partitions or system-controlled partitions. Support for system-controlled partitions must be included in the Executive during system generation. In a fixed partition system, each user terminal is allocated a dedicated partition in which to run its tasks; all tasks for that terminal must be installed to run in that partition. In a system-controlled partition, the Executive allocates memory to user tasks, as required; all tasks regardless of terminal association may be installed in the same partition. This scheme is much more flexible than a fixed partition scheme, because only the space needed for the current task mix is used. In a fixed partition system, much space could be wasted if partitions are made big enough to run tasks such as BIGTKB and BIGMAC; most work is done using smaller tasks such as EDI or PIP.

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4.9.2 Installing Checkpointable Tasks

4.9.2.1 Systems without Dynamic Allocation of Checkpoint Space - A single task image may be installed any number of times if it is not checkpointable. If the task is checkpointable it can be installed only once because it must checkpoint into the space allocated in its task image file. To install many copies of checkpointable tasks in this system, there must be a corresponding number of task image files.

Checkpointable MCR task image files should be copied and named according to the following conventions. The first three characters of the task name should be the MCR command name that invokes the task. This should be suffixed with the letter T and the unit number of the terminal from which the copy of the task is invoked. The tasks can then be installed with task names constructed in the same manner.

For example, assume the MACRO-11 assembler (MAC) is checkpointable, and copies of its task image file must be made to allow more than one user to run it. In such a case, there should be MACT0.TSK, MACT1.TSK, ..., MACTn.TSK, where the Tn suffix corresponds to a terminal number. Then, the file MACT0.TSK should be installed as task MACT0, MACT1.TSK as MACT1, and MACTn.TSK should be installed as task MACTn.

4.9.2.2 Systems with Dynamic Allocation of Checkpoint Space - On systems with dynamic allocation of checkpoint space and system-controlled partitions, only one copy of an MCR task needs to be installed. The system automatically spawns additional copies of the tasks as needed, and they are checkpointed on demand to the checkpoint file. The spawned tasks are named as described in the previous section.

If the system has only fixed partitions, an MCR task must be installed once for each partition (terminal) using the naming conventions discussed earlier. However, only a single copy of the task image file is required.

4.9.3 Installing Noncheckpointable Tasks

4.9.3.1 Fixed Partition Systems - For fixed partition systems, all MCR tasks should be installed for each partition (terminal) using the naming conventions discussed earlier. However, only a single copy of the task image file is required.

For tasks that are activated by the install-run-and-remove option of the RUN command, the task INS should be installed in each dedicated terminal partition. Tasks started by the install-run-and-remove command are named TTn, where n is the unit number of the terminal from which it was started. The task runs in the partition in which the task INSTn was running. The partition and naming conventions may be overridden by explicitly including the task and partition name in the RUN command.

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4.9.3.2 **System-Controlled Partitions** - For multi-user systems with a system-controlled partition, the Executive names and creates tasks. Only one copy of each task needs to be installed in the system-controlled partition. The default name should be that used in single-user systems (e.g., MACRO-11 is ...MAC).

4.9.4 Task Invocation

When you type the command to invoke an MCR task (e.g., >MAC A,A=B), the system executes the following algorithm, where XXX is the command name:

1. Search for ...XXX in the list of installed tasks. If found and not active, start it, and assign TI: to the terminal which issued the command.

Otherwise:

2. Search for XXXTn in the list of installed tasks. If found and not active, start it, and assign TI: to the terminal which issued the command.

If XXXTn is active, issue TASK ACTIVE message.

Otherwise:

3. If task XXXTn was not found, and task ...XXX was found but was active, and if task ...XXX is installed in a system-controlled partition, then duplicate the task control block entry for task ...XXX, name the task XXXTn, start it, and assign TI: to the invoking terminal. On task exit, deallocate the temporary task control block entry for the XXXTn.
4. If both tasks ...XXX and XXXTn were not found, issue TASK NOT IN SYSTEM message.

For the install-run-and-remove option of the RUN command, the task is always named Tn, where n is the unit number of the terminal from which it was requested. It is installed in the partition that task INS is running in, unless overridden by the /PAR= option.

4.9.5 Disk Swapping

Disk swapping allows more tasks of equal (or close) priority to share an amount of memory into which they cannot be loaded simultaneously. Swapping is accomplished by varying task priorities so that tasks of similar priorities checkpoint each other periodically. Swapping is supported in both mapped and unmapped systems, and in user- and system-controlled partitions; the only required Executive feature is checkpointing. Swapping costs very little in terms of Executive (size and time) overhead. The disk requirements of a swapping system can be greatly reduced by the inclusion of dynamic checkpoint space allocation in the Executive.

Swapping does not affect the basic checkpointing algorithm as described earlier. For example, a task can only checkpoint another task of lower priority, never one of equal or higher priority. However, when swapping is enabled, the priority of tasks resident in memory, with respect only to the allocation of memory, varies with

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time. The task's priority with respect to all of the other system resources DOES NOT CHANGE.

There are two SYSGEN parameters that control the swapping algorithm.

1. 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 a half of a second.
2. 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.

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. The symbol S\$\$WPR is equated to the swapping priority range specified during SYSGEN. In a swapping system, 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 to +S\$\$WPR. On the occurrence of each swapping interval, the swapping priority of each resident task is reduced by one until it reaches -S\$\$WPR. 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 main partition.

When specifying the swapping parameters, consider the following hints.

1. From the time a task is loaded into memory, the average time it takes for it to be checkpointed by a task of the same running priority is roughly equal to the product 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. In a system that supports checkpointing during terminal input, terminal input is also a factor in causing checkpointing to 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 code to service many tasks of equal priority.

4.9.6 Round-Robin Scheduler

You can include an optional round-robin scheduler in the Executive. This scheduler time-slices the CPU among tasks in a specified priority range. It ensures that all tasks of equal priority share the CPU.

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Round-robin scheduling does not affect the standard processor competition by 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 on the Active Task List). Tasks that are checkpointed or in the partition wait queue are not affected.

4.9.7 Checkpointing During Terminal Input Wait

You can select an Executive SYSGEN option that allows tasks that are checkpointable to be displaced from memory while they are waiting for terminal input. This feature allows more copies of terminal I/O-bound tasks (e.g., EDI) to be run than normally could be run in a given amount of memory.

When the terminal driver dequeues a terminal input request for a checkpointable task that has checkpointing enabled, is not at AST state, and has ASTs enabled, the task is stopped from further execution. Thus, even if the task has not entered a wait state for the terminal input, its execution immediately stops when the request is dequeued by the terminal driver.

Normally, a task that has been checkpointed for terminal input is not brought back into memory until its terminal request has been satisfied. This is true even if memory becomes available during the wait. The only way the task can execute further, prior to the completion of the terminal input, is to receive an AST.

When a task is stopped in this manner, its effective priority within its partition drops to zero. (Its actual priority never changes.) Therefore, lower priority tasks ready to run can cause a higher priority task that is waiting for terminal input to be checkpointed. When the terminal input to the checkpointed higher-priority task completes, the Executive removes the stop condition and the task can be brought back into memory. If necessary, the Executive displaces lower priority checkpointable tasks to make room for it.

4.9.8 Dynamic Checkpoint Space Allocation and Task Extension

Memory usage can be improved in large multi-user systems by making all or most of the tasks in the system checkpointable. In doing so, the system disk requirements can be greatly reduced if the system includes dynamic checkpoint space allocation. With this feature, all task checkpointing operations use common system checkpoint files. Thus, tasks can be installed as checkpointable without having to allocate checkpoint space in the task image file. Furthermore, multiple copies of a checkpointable task can be run from a single task image. Coupled with task checkpointing during terminal input, the number of tasks that absolutely require memory residency can be reduced sharply.

System checkpoint files are established and eliminated with the MCR ACS command. 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 multiple ACS commands are issued, the fastest devices should be specified 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

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checkpoint space (200 blocks) can be allocated on the RS04. To ensure that checkpoint allocation failures never occur, additional space (1200 blocks) should be allocated on the RP06. The startup command file would then contain the following two lines:

```
ACS DS:/BLKS=200.      !ALLOCATE PRIMARY CHECKPOINT FILE.  
ACS DB:/BLKS=1200.    !ALLOCATE SECONDARY CHECKPOINT FILE.
```

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. For example, all tasks running in SYSPAR should have preallocated checkpoint space. A task which 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. With this algorithm, the Executive tends to checkpoint a task to the fastest device when a task was installed from a slower device.

Selection of the Extend Task directive during SYSGEN allows tasks to increase or decrease their memory allocation during execution. Although this feature does not require dynamic checkpoint space allocation, its flexibility is limited without it. The system utilities, MACRO and Task Builder, use the Extend Task directive to maintain a memory-resident symbol table until reaching the maximum size as specified by the system manager. In a system that supports the Extend Task directive, these utilities can be installed with an increment as low as 2048 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.

4.9.9 QIO Speed Optimizations

If you select the QIO speed optimizations during SYSGEN, the speed of QIO operations are increased in the following three ways:

1. I/O packets are preallocated
2. BLXIO (block transfer) speed is optimized
3. I/O completion is overlapped.

4.9.9.1 I/O Packet Preallocation - The Executive maintains a LIFO list of preallocated I/O packets; the maximum size of the list is specified by the system manager. When an I/O packet is required, the Executive removes one from this list. If the list is empty, the Executive allocates the packet from dynamic memory; this is a significantly slower operation. When an I/O packet is deallocated, it is linked into the list if the list is not full. Thus, in each non-ACP I/O request, two fast LIFO list operations replace the slower

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core allocations and deallocations, saving several hundred microseconds. Some I/O requests involving ACPs require two I/O packets and therefore benefit twice as much.

In considering the number of I/O packets to preallocate, the number should be considered on the normal fluctuation in the total number of I/O requests, which is always a smaller number than the total number of I/O requests typically outstanding on the system. The storage needed is 18 words per I/O packet.

4.9.9.2 BLXIO (Block Transfer) Speed Optimizations - This feature optimizes the Executive routine \$BLXIO in the module BFCTL for mapped systems only. The optimizations are as follows.

1. The routine decides whether or not it can perform the transfer a word at a time, as opposed to a byte at a time.
2. Vectors of word and byte MOV instructions are allocated (up to a user-specified length) to save time on loop control during the move. For example, if you specify 16 words in each vector, a 36 word transfer causes the loop control to be entered three times as opposed to 36 times if there was a single MOV instruction.

The following users can benefit from this feature:

1. File system ACP (for open and close operations)
2. The shuffler task
3. DECNET

4.9.9.3 Overlapped I/O Completion - This 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 may cause multiple I/O requests to the same device to complete in an order other than the issued order.

4.9.10 Multiuser Protection

The following sections summarize the implications of multiuser protection on various system directives. Refer to the RSX-11M Executive Reference Manual for a detailed description of Executive directives.

4.9.10.1 Abort, Resume, and Cancel Schedule Requests - These directives, when issued from a nonprivileged task, are rejected for a privilege violation if the target task does not have the same TI terminal (i.e., was not initiated from the same terminal). The CANCEL SCHEDULE REQUESTS directive is rejected if the TI address of the nonprivileged issuing task is not CO:.

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4.9.10.2 **Request and Run** - If a nonprivileged task issues a REQUEST directive that specifies a UIC different from its own, only the default UIC of the requested task is set to the UIC specified. The protection UIC of the requested task is the same as that of the requesting task. Because of a data structure size limitation, nonprivileged tasks cannot specify a UIC other than their own in a RUN directive.

4.9.10.3 **Queue I/O Request** - A nonprivileged task cannot issue an I/O request to a privately allocated device unless its TI terminal is the same as the terminal to which the device is allocated (i.e., it owns the device).

4.9.10.4 **Slave Tasks** - Slave tasks perform functions for other tasks on a SEND DATA and REQUEST basis. Examples supplied with RSX-11M are the print spooler and cross-reference tasks. When a slave task issues a RECEIVE DATA directive, it automatically assumes the TI terminal and protection UIC of the sender task. Thus, a slave task always has the same access to files and allocated volumes as its sender tasks. However, when a slave task issues an ASSIGN LUN directive, all logical assignments for the current TI of the slave task (via the MCR ASN command) are ignored. Note that file specifiers to the print spooler and cross-reference tasks always include actual physical device names resolved prior to the issuance of the SEND DATA directive according to the logical device assignments in effect at that time.

4.9.11 Multiple ACPs - Executive Interface

The Executive supports a multiple ACP interface to the ACPs, MCR, Shuffler, and Loader. When these tasks are active, but detect that there is nothing for them to do, they set a bit in their task control block which makes them checkpointable by any other task in the partition, regardless of priority. The Shuffler exits when all system-controlled partitions in the system have reached a stable state (see Section 4.1.4); MCR and the Loader are now always active. The interface provides the following benefits:

1. Multiple ACPs can share the same partition. In fact, the partition may further be shared with MCR, the Shuffler and TKTN if desired.
2. MCR and the Loader never exit, thereby improving the response to these system tasks. Furthermore, if MCR is placed in a dedicated partition, or in a partition with only the Shuffler and TKTN, it tends to remain in memory between commands for even faster response.

4.9.12 ALTER PRIORITY Directive

The ALTER PRIORITY directive allows one task to modify the priority of itself or another task. Any control blocks associated with the task in priority-ordered queues are reordered immediately. This includes such things as the task control blocks and I/O packets. Any I/O packets for the task which are currently being processed by a driver or ACP are not affected. In systems with multi-user protection, a task must be privileged to issue this directive.

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One possible use of the ALTER PRIORITY directive is to implement scheduling algorithms to run in addition to or instead of the Executive's round-robin scheduling and disk swapping algorithms. Such scheduling algorithms could be implemented by a task using the ALTER PRIORITY directive that runs both privileged and at high priority.

Two MCR features use the ALTER PRIORITY directive:

1. The ABORT MCR command elevates a task's priority to 247 when it is being aborted, thus allowing the task to exit the system quickly.
2. The MCR indirect command file processor task AT., alters its priority to 10 whenever waiting for a task to exit. It returns to its installed priority after detecting the task's exit. Thus, with the ALTER PRIORITY directive in the system, the /PRI option of INSTALL may be used to install AT. at a high priority such as 65 to make the processing of indirect command files more responsive. If the Alter Priority directive is not in the system, AT. must be installed with a priority of 10.

CHAPTER 5

VMR COMMANDS

5.1 COMMAND SUMMARY

The Virtual Monitor Console Routine (VMR) commands specified in this chapter are listed below by category. This command summary provides a compact overview of the facilities available through VMR. The detailed descriptions of the VMR commands given in Section 5.6 are presented in alphabetical order, according to command name, for quick reference.

Initialization Commands

ASN	Define or delete a global logical device assignment. List current assignments on user's terminal.
INSTALL	Install a task in the system image.
LOAD	Load a device driver.
REDIRECT	Redirect all I/O requests from one physical device to another.
SAVE	Write the system image of memory onto a secondary media in boot-strappable format.
SET	Set system and terminal characteristics; define partitions; display terminal and partition characteristics on entering terminal.
TIME	Enter time and/or date into the system image; display the time and date on entering terminal.
UNLOAD	Unload a device driver.

Informational Commands

DEVICES	Display on the entering terminal a list of peripheral devices defined in the system image.
LUNS	Display on the entering terminal the list of LUN assignments for an indicated task.
PARTITIONS	Display on the entering terminal the list of partitions defined in the system image.
TASKLIST	Display on the entering terminal a list of all tasks installed in the system image.

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Task Control Commands

ALTER	Alter the priority of a task.
CANCEL	Cancel time-based initiation requests for a task.
FIX	Fix a task in system image.
REASSIGN	Change a task's LUN assignment.
REMOVE	Remove a task from the system image.
RUN	Schedule a task's activation. The task may run after one clock tick, after a delay, or in synchronization with the system clock. Periodic rescheduling is optional.
UNFIX	Unfix a task from the system image.

5.2 MONITOR CONSOLE INTERFACE

5.2.1 Introduction

The Virtual Monitor Console Routine (VMR) is an RSX-11M system program that allows the complete online configuration of RSX-11M and RSX-11S systems. As its name suggests, VMR provides the capability to execute MCR commands that are directed to the disk image of a system.

VMR supports a compatible subset of the MCR commands described in the RSX-11M Operator's Procedures Manual. All supported commands have identical syntax and semantics as their MCR counterpart with the one exception of the SAVE command.

5.2.2 Starting VMR

You have four methods for starting VMR. The first three methods apply when VMR is installed and ready to be executed. The fourth method installs VMR, executes it, and then removes it on exit.

Method 1:

```
>VMR @indirect
```

The system loads VMR, executes the specified indirect command file, and then VMR exits.

Method 2:

```
>VMR
```

The system loads VMR and then VMR responds with the following prompt:

```
ENTER FILENAME:
```

VMR COMMANDS

Method 3:

>RUN VMR

The system loads VMR and then VMR responds with the following prompt:

ENTER FILENAME:

Method 4:

>RUN \$VMR

The system installs VMR from the pseudo device LB: under the system UIC (normally, [1,50] or [1,54]), loads it, and VMR then responds with the following prompt:

ENTER FILENAME:

In all starting methods except method 1, VMR prompts with:

ENTER FILENAME:

At this point, you specify the file that contains the image of the RSX-11M or RSX-11S system to be modified. A symbol table file corresponding to the system image file with the same filename, but with file type .STB, must be under the same UIC. (See exception described for the /IM switch below.) For example, if you entered the file specifier RSX11S.SYS in response to the

ENTER FILENAME:

prompt, a corresponding file, RSX11S.STB, must exist that contains the symbol definitions for the RSX11S.SYS system image.

The system image and symbol table files are in the standard format produced by the RSX-11M Task Builder.

Upon receiving a valid file specifier, VMR opens and reads the symbol table file; it also opens the system image file and verifies that the file is actually a system image. VMR then prompts with

VMR>

and waits for you to enter a command. You may enter any valid VMR command or end VMR by typing CTRL/Z*.

If you used method 1 to start VMR, the specified file contains a series of commands to be executed by VMR. The first record in the file must contain a file specifier for the system image file that is to be modified.

In addition to specifying an indirect file to start VMR, you may also enter

@filespecifier

anytime that VMR is prompting for input. This directs VMR to get input from the specified file until it reaches an end-of-file and to

*CTRL/Z is typed by simultaneously depressing the CTRL and Z keys.

VMR COMMANDS

return to the terminal for further input. This feature of VMR is very useful in cases where a series of INSTALL commands, for example, are to be repeated for several generated systems.

5.3 VMR FILE SPECIFIERS

File specifiers accepted by VMR are in the standard RSX-11M form:

```
dev:[g,m]filename.type;ver/sw
```

where:

dev: is the device-unit on which the volume containing the desired file is mounted, for example, DK0: or DT1:. The name consists of two ASCII characters followed, by an optional 1- or 2-digit octal unit number.

Default: SY0:

[g,m] is the User File Directory (UFD), consisting of a group number and a member number.

Default: the UIC under which VMR is running.

filename is the name of the file. In RSX-11M, a filename can be up to nine alphanumeric characters in length. Filename and type are always separated by a period (.).

Default: none; must be specified.

typ is the the file type, consisting of up to three alphanumeric characters.

Default: SYS for system image files, and CMD for indirect files.

ver is the version number in the range 0 through 7777(8).

Default: highest version.

/sw is a 2-character ASCII name identifying a switch option.

Only one switch option (/IM) is provided with VMR; it is used in conjunction with the Save command to write non-RSX-11M/RSX-11S system images to secondary media in bootstrappable format. The switch may be specified only on the system image file and overrides the requirement for the symbol table file.

When the /IM switch is specified, the only command VMR will accept is the Save command. The /IM switch is useful when RSX-11M is used as a host system to develop and create small, core-only systems that must be loaded from a serial medium such as paper tape.

5.3.1 Command Syntax

It is not necessary to type the entire command name when entering a command. VMR requires only the first three letters of a command name, followed by the command parameters, if any exist. If parameters exist, they must be preceded by at least one blank or tab.

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The following example shows how the Time command can be specified. Note that the square brackets in the example indicate that the "E" is optional; the square brackets are not part of the command name. The angle brackets denote that the enclosed values are not literally part of the command syntax. For example, <CR> indicates that a carriage return terminates the input line.

```
VMR>TIM[E] <CR>
14:00:04 21-NOV-77
```

Thus, either

```
VMR>TIM <CR>
```

or

```
VMR>TIME <CR>
```

is acceptable.

5.3.2 Keywords

Some commands use keywords that generally apply to a command argument. A keyword consists of a slash (/), followed by an ASCII identification, and optionally followed by an equal sign (=) and the value of the keyword, as follows:

```
/Keyword=value
```

Keywords can be entered in any order. As an example of keyword usage, the INSTALL command requires a filename argument specifying the task to be installed. Keywords can be appended to the filename. One such keyword, /TASK, can specify the name under which the task is to be installed. Thus,

```
VMR>INS JIM.TSK/TASK=SUPER
```

causes the task contained in the file named JIM.TSK to be installed with a name of SUPER. Keywords are command-specific and are defined with each command.

5.3.3 Comments

VMR treats a line of text as a comment if the first character in the line is a semicolon (;). In addition, the exclamation mark (!) may be used to delimit comments in a command. The first exclamation mark starts the comment and the next exclamation mark or end of line terminates the comment. All text between the two exclamation marks is ignored. For example:

```
>; THIS LINE IS A COMMENT
```

```
>TAS !THIS IS A COMMENT STRING!
```

Comments are especially useful to clarify commands in VMR indirect command files. (See the RSX-11M Operator's Procedures Manual for further information about indirect command files.)

VMR COMMANDS

5.4 COMMAND NAMES

Command names are at least three characters in length. VMR accepts the first three characters of a command and then searches for a blank, tab, carriage return, or ESCape character. Therefore, embedded blanks are not allowed in a command name. If a command is entered incorrectly, VMR displays an error message at the entering terminal.

Syntactical descriptions of commands and messages described in this chapter observe the following notational conventions:

5.4.1 Lower-Case

Lower-case indicates a variable with an actual value determined when the command is entered or the message is issued. For example, the value of taskname depends on the name of the task associated with the command or message.

5.4.2 Brackets []

Brackets [] enclose optional items. A syntactical element enclosed in brackets (for example, [dt]) is optional; it may or may not be included in the command. One common exception to this rule is the syntax for the specification of a UIC. The format for a UIC is [g,m], where the square brackets are required syntactical elements.

5.4.3. Numeric Values

Numeric values may be entered in a command as decimal or octal unless explicitly qualified. Decimal values are indicated by a trailing period; octal values are indicated by the absence of a trailing period. Thus,

255. and 377

have the same value. (The number 255. is decimal; the number 377 is octal.)

5.5 COMMAND DESCRIPTION FORMAT

The following subheadings are used in the detailed command descriptions given in Section 5.6. Subheadings that do not apply to a particular command are omitted from the command description.

COMMAND NAME

This subheading identifies the command name in capital letters. The minimal VMR command acronym is shown on the right margin. The text following this subheading describes the command's function.

The command format is given, and all parameters are described.

Examples:

Example uses are shown.

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Notes:

A list of special considerations that may assist the programmer in using the command properly appears under this subheading.

Command Related Error Messages:

Error messages specific to the command appear under this subheading. The command may also produce the common error messages listed in Section 5.7. These common error messages are not listed with the individual commands presented in this chapter.

VMR COMMANDS

5.6 VMR COMMAND DESCRIPTIONS

ALTER

ALT

The ALTER command allows the operator to change the static priority of an installed task. The format of the ALTER command is:

```
ALT[ER] taskname /PRI=priority
```

where:

taskname The name of the task whose priority is to be altered.

/PRI Changes the task's static priority.

priority The new priority to be assigned to the specified task, from 1 to 250 (decimal).

Example:

```
>ALT TEST /PRI=248.
```

Alter the static priority of task TEST to 248(10).

VMR COMMANDS

ASSIGN

ASN

The ASSIGN command defines, deletes, or displays logical-device assignments. Logical-device assignments are a way to associate logical names with physical devices, pseudo devices, or other logical devices. When you assign a logical name to a pseudo or logical device, the system resolves the assignment to the associated physical device. There are three types of logical-device assignment: global, local, and login. VMR supports the manipulation of global assignments only. See the RSX-11M Operator's Procedures Manual for additional information on local and login assignments.

The manipulation of global assignments applies to all tasks in the running system.

A logical-device name has the same syntax as a physical device unit; it consists of a 2-character ASCII name (alphabetic) and an optional 1- or 2-digit octal unit number, followed by a colon (:). The 2-character name either can be equivalent to a standard RSX-11M device name (for example, DK:) or two letters picked at random (for example, XY:).

When you install a task, or the system executes an ASSIGN LUN directive, the system scans the logical device table before the physical device table when it searches for a specified device. As a result, you can define logical device names that are identical to physical device names even though the logical and physical device names do not refer to the same physical device. The system resolves a specified device name to the first matching table entry found. If a logical device name is identical to a physical device name, the logical name has precedence.

The formats of the ASSIGN command are:

```
ASN ppnn:=llnn:/GBL
```

Define a global assignment that associates the logical name llnn: with device ppnn:.

```
ASN /GBL
```

Display all global assignments for the system.

```
ASN =[llnn:]/GBL
```

Delete the specified global logical-device assignment or all global assignments if the command omits llnn:.

where:

pp	Physical, logical, or pseudo device name
nn	Unit number
ll	Logical device name

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Examples:

```
VMR>ASN  DK:=GB0:/GBL      !Define global logical device name
VMR>ASN  /GBL              !List all assignments
GB0:     DK0:  GLOBAL
VMR>ASN  =/GBL            !Delete all global assignments
```

Command Error Messages:

VMR -- LOGICAL DEVICE NOT IN SYSTEM

The specified logical device name was not defined and therefore could not be found in the logical device assignment table.

VMR -- PSUEDO DEVICE ASSIGNMENT ERROR

A logical device name cannot be assigned to a pseudo device.

VMR COMMANDS

CANCEL

CAN

The CANCEL command allows you to cancel time-based initiation requests for a task. These requests result from the RUN\$ directive or any of the time-synchronized variations of the MCR or VMR RUN command.

CANCEL does not affect the execution of the task that may be active in the saved system image. It removes only the time-based schedule requests still in the queue.

The format of the CANCEL command is:

```
CAN[CEL] taskname
```

Example:

```
VMR>CAN XKE
```

Cancel all periodic rescheduling and time-based initiation requests for task XKE.

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DEVICES

DEV

The DEVICES command displays on the entering terminal the symbolic names of all device-units or, optionally, all of a particular device type defined in the system image. The device names appear in one column; a second column contains additional information (when necessary) about each device.

The format of the DEVICE command is:

```
DEV[ICES]
```

```
DEV dd:
```

where:

```
dd          is the particular device type to be displayed.
```

Examples:

```
VMR>DEV
DB0:    LOADED
DB1:    LOADED
DB2:    LOADED
DB3:    OFFLINE LOADED
DK0:    LOADED
DK1:
DK2:
DS0:
DS1:
DT0:    LOADED
DT1:    LOADED
LP0:    LOADED
MM0:    LOADED
MM1:    LOADED
PP0:    UNLOADED
PR0:    UNLOADED
TT0:
TT1:
TT2:
TT3:
TT4:
CO0:    TT0:
CL0:    LP0:
SY0:    DB0:
VMR>DEV DK:
DK0:    LOADED
DK1:
DK2:
```

Please note that the pseudo device SY: is not Redirected until the system is booted. The following notes describe the messages that can appear in the second column. More than one message can appear on the same line.

- OFFLINE indicates that, although the system tables contain entries for this device, the system as saved did not contain the related device.
- LOADED indicates that the driver for the device is loadable and is currently loaded.

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- UNLOADED indicates that the driver for the device is loadable and is currently not loaded.
- A device name in the second column is the device to which the corresponding device in the first column has been redirected.
- Absence of either LOADED or UNLOADED in the second column indicates that the driver is permanently resident; it is linked with the Executive.

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FIX-IN-MEMORY

FIX

The FIX-IN-MEMORY command allows you to load a task into its partition in the system image. Requests for running the task can be serviced more quickly because the task is memory-resident and does not have to be loaded from the disk before it can run. VMR can fix a task in the system image only if the partition in which it is to be fixed is available. The command cannot be used to fix a task in a system controlled partition. On RSX-11S systems, all installed tasks must be fixed since they cannot be loaded into the running RSX-11S system.

Fixed tasks remain physically in memory even after they exit. Therefore, they do not have to be reloaded when a request is made to run them. (Note that re-executing fixed tasks is not always practical.) Only an UNFIX or REMOVE command can free the occupied partition.

The following restrictions apply to the fixing of tasks:

- Checkpointable tasks cannot be fixed,
- Active tasks cannot be fixed,
- A task must be installed before it can be fixed,
- VMR cannot fix a task into a system controlled partition.

The format of the FIX-IN-MEMORY command is:

FIX taskname

Example:

VMR>FIX XKE

FIX task XKE in its partition.

Command Error Messages:

VMR -- CANNOT FIX A TASK IN A SYSTEM CONTROLLED PARTITION

This is a restriction of VMR. To fix a task in a system controlled partition, use the MCR FIX command and then SAVE the system image.

VMR -- FILE name HAS INCONSISTENT DATA

The task or partition that you are trying to fix is logically beyond the end of the system image file.

VMR -- PARTITION BUSY

The partition in which the task was to be fixed was occupied, so the task could not be fixed.

VMR -- TASK ALREADY FIXED

The specified task was already fixed in memory.

VMR -- TASK CHECKPOINTABLE

The subject task was checkpointable. A checkpointable task cannot be fixed in memory.

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INSTALL

INS

The INSTALL command makes a specified task known in the system image, or loads a resident library into a common partition in the system image. An installed task is dormant until the Executive receives a request for it to run. The optional keywords either provide parameters that were not specified at task build, or they override previously specified parameters.

When a task is installed, VMR creates a Task Control Block (TCB) for the task in a system image table called the System Task Directory (STD). The task parameters contained in the TCB enable the system to run the task when requested to do so by an MCR command, VMR command, or a system directive. A task cannot be run until you install it.

A task's TCB contains the address of the load-device Unit Control Block (UCB) and the Logical Block Number (LBN) of the task image file. The Executive can therefore load the task image in one transfer when an MCR command or system directive requests an installed task. (Loading does require more than one transfer if the task is greater than 32K words.)

When VMR installs a task in a virgin system, it stores the task's file identification in the task header. When you save a system, the SAVE command places the file identification, rather than the file's LBN, in the TCB. Then, when the system is rebooted, it reopens the task file and stores the new current LBN of the task in the TCB. If a task has been deleted, the system cannot open the task file when the system is rebooted. The system then automatically removes the task's TCB from the STD. When VMR installs a task in a saved system image, it stores the task's file identification rather than the LBN in the TCB to allow a reboot to occur successfully.

Also a saved system does not retain the physical addresses of installed tasks. The Disk Save and Compress (DSC) utility can compress and copy a disk containing a saved system, thus moving the task files to different physical locations. But because the TCB entries contain task file identifications, rather than LBNS, after a system save, the system can function normally when it is rebooted.

The format of the INSTALL command is:

```
INS[TALL] filespec[/keyword] [/keyword]...
```

Keywords:

/CKP=option

/INC=size

/PAR=pname

/PMD=option

/PRI=number

/SLV=option

/TASK=taskname

/UIC=[group,member]

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where:

filespec is the file specifier in the form:

dev:[group,member]filename.type;version

The type defaults to TSK; standard defaults apply to the remaining fields.

CKP /CKP=option. Checkpoint option. If CKP=YES (default for checkpointable tasks), checkpointing is allowed. If CKP=NO, checkpointing is disabled for the task.

The /CKP keyword overrides the /CP switch specified at task build.

On systems that support the dynamic allocation of checkpoint space, the task image file does not need to contain allocated checkpoint space. The presence of the /CKP=YES keyword instructs the system to allocate checkpoint space for the task when required from a checkpoint file.

INC /INC=size. The number of additional words of address space to be allocated to a task that is to run in a system-controlled partition. The extension size is usually expressed in octal but may also be expressed in decimal by appending a period. This keyword overrides the EXTTSK or PAR parameter used at task-build time. Tasks that specify the size of the partition in which they are running use this keyword to identify how much dynamic space they may allocate to symbol tables or buffers. Tasks such as MACRO-11, TKB, PIP, VFY, and AT. use the space from the end of the task image to the end of their address space as dynamic memory. In effect, the INC keyword defines the number of words in this dynamic region.

Default: size specified at task-build time, or zero.

PAR /PAR=pname. A partition name that overrides the partition specified at task-build time. In an unmapped system, the specified partition must have the same base address as the partition for which the task was built.

If the keyword specifies a nonexistent partition, VMR issues a warning message and attempts to install the task in the GEN partition.

Default: TKB uses the name GEN. (See Chapter 4 for an explanation of multiuser system defaults.)

PMD /PMD=option. Post-Mortem Dump option. If PMD=YES, a post-mortem dump is requested for the task if it aborts because of an SST error condition. If PMD=NO (the default from a task-build), no dump is requested at SST abort time. To generate a dump, the post-mortem dump task PMD... must be installed in the system. This keyword overrides the /PM switch specified at task-build time.

Default: Specified at task-build time.

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PRI /PRI=number. Priority number. The value range is 1 through 250(10). Number conventions apply.

Default: /PRI=50.

SLV /SLV=option. Slave task option. The two options are YES and NO. If the command specifies /SLV=YES, data sent to the installed task is marked with the TI: of the sending task. When the installed task receives the data, the system sets the task's TI: to that associated with the data. This keyword overrides the /SL switch specified at task build.

If the command specifies /SLV=NO, the TI: of the task does not change when receiving data.

Default: Specified at task build.

TASK /TASK=taskname. The name by which the task is to be referred.

Default: The name specified at task-build time or the first 6 characters of the filename.

UIC /UIC=[group,member]. The square brackets are required syntax. This UIC is the default for the task. It can be overridden in the RUN command. The task UIC determines into what file-protection class (system, owner, group, world) a task belongs, and thus directly influences file access. Note that file protection may differ from file to file.

Default: default from task build. This default applies only to tasks started by a RUN\$ directive or a RUN command that specifies a time delay before runtime. Tasks started by typing the name as a command (for example, PIP and TKB) run under the default UIC of the terminal from which the command was issued.

Examples:

```
VMR>INSTALL SCAN
```

Install task SCAN. Priority and UIC defaulted.

```
VMR>INSTALL DK1:[1,111]SCAN.TSK;4/PRI=103
```

Install task SCAN, file type TSK, version 4 on device DK1:, group number 1, member number 111, with a priority of 103(8).

```
VMR>INS MAC/INC=4096./PAR=SYSCTL
```

Install task MAC in the system-controlled partition SYSCTL and increase the task size by 4096 decimal words.

VMR COMMANDS

Command Error Messages:

VMR -- ADDRESSING EXTENSIONS NOT SUPPORTED

The command tried to install a task with a VSECT (virtual section) into a system image that does not support the feature.

VMR -- BASE ADDRESS MUST BE ON 4K BOUNDARY

The base virtual address of the task was not on a 4K boundary. This message is applicable only to mapped system images.

VMR -- BASE MISMATCH COMMON BLOCK <common-name>

The base address of the partition did not match that of the common block. This message is applicable only to unmapped system images.

VMR -- CHECKPOINT AREA TOO SMALL

The area allocated for checkpointing in the task image file was smaller than the partition into which the task was being installed. The system image does not support the dynamic allocation of checkpoint space.

VMR -- CHECKPOINT SPACE TOO SMALL, USING CHECKPOINT FILE

A warning message. The checkpoint space allocated in the task image file is too small for the size of the task (usually because of the /INC keyword). The system image supports the dynamic allocation of checkpoint space and will therefore use a checkpoint file to contain the rolled-out task. Note that since no checkpoint file exists when the system is booted, this message should be considered a fatal error if it is issued by any of the tasks used by the system during the boot. These tasks are: MCR; MOV; and FllACP.

VMR -- COMMON BLOCK IS TASK PARTITION <common-name>

A task's request for access to a common block was rejected because the requested partition was a task partition.

VMR -- COMMON BLOCK NOT LOADED <common-name>

The specified common block was linked to the task but had not been installed into the system image. Install the common block, then install the task.

VMR -- COMMON BLOCK OCCUPIED

An attempt was made to load a common block that was occupied.

VMR -- COMMON BLOCK PARAMETER MISMATCH <common-name>

Parameters of a common block did not match those in the task's label block.

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VMR -- COMMON BLOCK SEGMENT COUNT ERROR

The command tried to install a resident library with overlays, but the number of overlay segments specified in the task header is different from the number specified in the segment descriptors.

VMR -- DEVICE ddn: NOT IN SYSTEM

The specified device is not defined in the system image.

VMR -- FILE filename HAS INCONSISTENT DATA

When loading a common library, the partition extended beyond the size of the task image file and thus could not be loaded.

VMR -- FILE NOT CONTIGUOUS

An attempt was made to install a task from a non-contiguous file. Task images must be contiguous files.

VMR -- FILE NOT TASK IMAGE

Data in the label block was not correct, indicating that the file was not a task image.

VMR -- ILLEGAL FIRST APR

A task was built using a base APR other than zero for non-privileged tasks or APR 4 or APR 5 for privileged tasks. If the Executive has been built to support 20K of address space, APR 5 is the only valid base APR for tasks mapping into the Executive. A privileged task that does not map into the Executive must use APR 0 as its base. (See the RSX-11M Task Builder Reference Manual for a description of the /PR keyword.) This message applies only to mapped system images.

VMR -- ILLEGAL PRIORITY

The value of the priority specified in the command was out of range (that is, not 1 to 250(10), inclusive).

VMR -- LENGTH MISMATCH COMMON BLOCK <blockname>

The length parameter for the common block, as described in the label block for the task image, did not match the corresponding length parameter defined in the system image. A task's label block data must match system data for that task before it can be installed.

VMR COMMANDS

VMR -- NO CHECKPOINT SPACE, ASSUMING NOT CHECKPOINTABLE

This is a warning message. The command attempted to install the task as checkpointable; but the task was not built as checkpointable with checkpoint space allocated in its task image file. Because the system does not support the dynamic allocation of checkpoint space, it considers the task not to be checkpointable.

VMR -- NOT ENOUGH APRS FOR TASK IMAGE

The Task Builder allows the user to specify the virtual base address of a task image as a multiple of 4K. Privileged tasks start at virtual 100000(8) to map the first 16K of the Executive, or virtual 120000(8) to map the first 20K of the Executive, at the same time as the user task. If the virtual base address is set too high, the task image may not be able to be mapped with the remaining mapping registers. This message is applicable to mapped system images only.

VMR -- PARTITION NOT COMMON

A partition specified for a common area or library is not defined as a common partition.

VMR -- PARTITION par NOT IN SYSTEM, DEFAULTING TO GEN

This is a warning message. The specified partition does not exist; VMR therefore attempts to install the task in the GEN partition.

VMR -- PRIVILEGED TASK LARGER THAN 12K

A privileged task was larger than 12K. Privileged tasks on an unmapped system have a maximum size of 12K.

VMR -- SPECIFIED PARTITION FOR COMMON BLOCK

A task was being installed into a common block.

VMR -- SPECIFIED PARTITION TOO SMALL

The task being installed was larger than the partition into which it was being installed.

VMR -- TASK AND PARTITION BASES MISMATCH

The base of the partition did not match the base of the task being installed. This message applies only to unmapped systems.

VMR -- TASK IMAGE I/O ERROR

VMR could not read the task-image file, or could not rewrite the task-image header (the device is write-locked.)

VMR COMMANDS

VMR -- TASK IMAGE CURRENTLY INSTALLED

The requested task image, which was checkpointable, had already been installed. On systems that do not support the dynamic allocation of checkpoint space, checkpointable tasks that have checkpoint space allocated can be installed only once; other tasks can be installed more than once.

VMR -- TASK IMAGE VIRTUAL ADDRESS OVERLAPS COMMON BLOCK <block-name>

The virtual addresses reserved for the task image overlap those reserved for the common block specified in the message. A corruption of the task image file probably caused the overlap.

VMR -- TASK NAME ALREADY IN USE

An attempt was made to install a task with the same name as one already in the system image.

VMR -- TOO MANY COMMON BLOCK REQUESTS

A task made too many common-block requests. A task is limited to seven common-block references.

VMR -- TOO MANY LUNS

A task requested more than 255(10) LUNs to be assigned.

VMR -- UNDEFINED COMMON BLOCK <blockname>

A task referenced a common block that is not defined in the system image. Usually, this message indicates that the task was built for another system.

VMR -- WARNING - PRIVILEGED TASK OVERMAPS I/O PAGE

A privileged task that is mapped into the Executive is usually also mapped into the I/O page in order to access the KTL1 registers and other devices. Many privileged tasks do not require this access and can use the additional 4K words of virtual address space for the task image. This message warns that a privileged task that may require access to the I/O page does not have the access.

VMR COMMANDS

LOAD

LOA

The LOAD command loads a nonresident device driver into the system image and constructs the data base and interrupt vector linkages required to allow access to the device. This command eliminates the need to link infrequently used device drivers permanently into the Executive. (Executive support of loadable device drivers is a system generation option.)

The command includes an optional keyword that specifies the partition into which the driver is to be loaded. The specified partition cannot be a common partition; but all other types of partition are permissible. If the command does not name a partition, VMR loads the driver into the partition chosen when the driver was built.

The format of the LOAD command is:

```
LOA[D] dd:[/PAR=parname]
```

where:

dd: is a 2-character ASCII device name

parname is the name of the partition into which the driver is to be loaded.

Examples:

```
VMR>LOAD MM: !LOAD TU16 DRIVER (MMDRV)
```

```
VMR>LOA LS:/PAR=DRVPAR !LOAD LPS11 DRIVER (LSDRV) INTO DRVPAR
```

Notes:

- Guidelines for building loadable device-driver tasks are rigidly defined. These guidelines are described in the RSX-11M Guide to Writing an I/O Driver. Note that the system generation procedures include provisions to simplify the task building of drivers.
- The LOAD command requires that a driver's TSK and STB files reside under the same UIC and on the same disk as the system image being worked on. For example, the command

```
LOA DT:
```

requires that the files DTDRV.TSK and DTDRV.STB reside on SY: under the current UIC.
- The LOAD command requires pool space as follows:
 1. If the driver data base is being loaded, the command needs pool space equal in size to the size of the data base.
 2. In a mapped system, the command needs pool space for an Interrupt Control Block (ICB) for each interrupt entry point in the driver.
 3. If the driver is being loaded into a system-controlled partition, the command needs pool space for a Partition Control Block (PCB).

VMR COMMANDS

Command Error Messages:

VMR -- DEVICE ddn: NOT IN SYSTEM

The data base for the device driver was neither in the system image nor in the driver's task image.

VMR -- DRIVER ALREADY RESIDENT

The specified device driver is already loaded or is permanently resident in the system image.

VMR -- DRIVER BUILT WITH WRONG STB FILE

The STB file for the driver is not compatible with the Executive STB file for the current system image.

VMR -- DRIVER REQUIRES RUNNING SYSTEM FOR LOAD/UNLOAD

The requested driver included the symbols \$ddLOA or \$ddUNL in its source. Support of driver load/unload calls can only be provided by MCR LOAD/UNLOAD. Note however, that these symbols are reserved for future use by the MCR LOAD and UNLOAD commands.

VMR -- FILE name HAS ILLEGAL FORMAT

The driver's STB file contained illegal object code or data.

VMR -- FILE name HAS INCONSISTENT DATA

The partition for loadable drivers is logically beyond the end of the system file image.

The driver task was not built according to guidelines. See the RSX-11M Guide to Writing an I/O Driver. Alternatively, the driver has an invalid loadable data base.

VMR -- FILE name NOT A VALID DRIVER TASK IMAGE

The driver's task image was either overlaid, had a task header, or referenced a resident library.

VMR -- FILE NOT CONTIGUOUS

The file ddDRV.TSK was not contiguous. The file must be contiguous.

VMR -- ILLEGAL DRIVER TASK APR USAGE

A device driver must be built for APR 5 and must be less than 4K (e.g. PAR=DRVPAR:120000:20000). This message applies to mapped systems only.

VMR COMMANDS

VMR -- ILLEGAL VALUE FOR SYMBOL symname IN FILE name

The symbol symname has been defined to an illegal value by the file name. This occurs for several reasons, some general and some specific to the individual symbols. For example, most symbols cannot be defined to zero and mapped loadable drivers cannot reference \$INTSV.

VMR -- INTERRUPT VECTOR ALREADY IN USE

A driver interrupt vector does not point to one of the nonsense interrupt entries in the system image.

VMR -- INVALID DRIVER DATA BASE AT OFFSET xxxx IN FILE name

The driver had an invalid data base value at offset xxxx relative to the symbol \$ddDAT. (See the RSX-11M Guide to Writing an I/O Driver.)

VMR -- INVALID INTERRUPT VECTOR

The interrupt vector address specified in the driver data base was too high for the current system image.

VMR -- INVALID RECORD ADDRESS FOR FILE name

An attempt was made to write outside of the system image file or to write beginning at a byte boundary. The most frequent cause of this is a corrupted system image or an STB file that does not match the system image.

VMR -- LOADABLE DRIVER SUPPORT NOT IN SYSTEM

The system generation option to support loadable device drivers was not chosen for the system image.

VMR -- NO POOL SPACE

The required amount of pool space was not available in the system image.

VMR -- PARTITION BUSY

The user-controlled partition or subpartition into which the driver was to be loaded was already occupied, or there was not enough room in a system-controlled partition.

VMR -- PARTITION name IS A COMMON

An attempt was made to load a device driver into a common partition. A device driver cannot be loaded into a common partition.

VMR COMMANDS

VMR -- PARTITION NOT IN SYSTEM

The partition specified either in the LOAD command or at task build was not in the system image.

VMR -- SPECIFIED PARTITION TOO SMALL

The partition into which the driver was to be loaded was not large enough to contain it.

VMR -- SYMBOL symname IS DOUBLY DEFINED BY FILE name

The symbol symname is defined twice by the file name. Duplicate symbols are illegal.

VMR -- SYMBOL symname IS UNDEFINED IN FILE name

The symbol symname was found in the file name, but it was not a symbol definition.

VMR -- TASK AND PARTITION BASES MISMATCH

The base address of the partition into which the driver was to be loaded did not match the base address of the partition address for which the task was built. This message applies to unmapped system images only.

VMR COMMANDS

LOGICAL UNIT NUMBERS

LUN

The LUN command displays at the entering terminal the static LUN assignments for a specified task. (Static assignments are those recorded in the task's disk-image file.) The display consists of a list of physical device units in one column, with the corresponding LUNs in an adjoining column. This command is valid for a virgin system only. It is not accepted for a saved system image.

The format of the LUN command is:

```
LUN[S] taskname
```

Example:

```
VMR>LUN XKE
SY0: 1
SY0: 2
CL0: 3
TT3: 4
TT3: 5
DK0: 6
TT3: 7
```

The display shows static assignments for LUNs 1 through 7 as recorded in the task-image file header; no other LUNs are statically assigned to the task XKE.

Command Error Messages:

```
VMR -- ILLEGAL OPERATION FOR SAVED SYSTEM
```

The LUN command can only be issued for a virgin system image.

```
VMR -- NO LUNS
```

The task that is the argument of the LUN command did not have any logical units. This is not an error message; it merely indicates that there were no assignments to display.

VMR COMMANDS

PARTITION DEFINITIONS

PAR

The PAR command displays on the entering terminal a description of each memory partition in the system image.

The display consists of five columns that specify:

1. Partition name,
2. Partition base address (octal),
3. Partition size (octal),
4. Partition kind, main partition (MAIN) or subpartition (SUB), and
5. Partition type:

TASK for user-controlled,
COM for common,
DEV for device registers,
SYS for system-controlled,
(taskname for task region),
DYNAMIC for dynamically created region, or
DRIVER for region occupied by a loadable driver.

COM partitions are used for re-entrant libraries and common data areas. DEV partitions allow tasks to communicate with specific device registers, such as the UDC-11 and ICS/ICR-11 industrial control subsystems. See the RSX-11M Operator's Procedures Manual for a description of system- and user-controlled partitions, as well as subpartitions. Dynamic and task regions are defined in the RSX-11M Executive Reference Manual. See the description of the VMR LOAD command for information concerning loadable drivers.

The format of the PAR command is:

PAR[TITIONS]

Examples:

Name	Base	Size	Kind	Type
VMR>PAR				
LDR	000000	000000	MAIN	TASK
SYSPAR	110000	010000	MAIN	TASK
FCPPAR	120000	026000	MAIN	TASK
DRVPAR	146000	026000	MAIN	SYS
	146000	007700	SUB	DRIVER - TT:
	155700	002100	SUB	DRIVER - DB:
	160000	002700	SUB	DRIVER - DM:
	162700	001000	SUB	DRIVER - DS:
	163700	001200	SUB	DRIVER - DK:
	165100	001100	SUB	DRIVER - DT:
	166200	001200	SUB	DRIVER - DX:
	167400	001000	SUB	DRIVER - LP:
	170400	000100	SUB	DRIVER - NL:
	170500	003300	SUB	DRIVER - MM:
GEN	174000	200000	MAIN	SYS
	174000	040000	SUB	(...SAV)

VMR COMMANDS

Name	Base	Size	Kind	Type
VMR>PAR				
LDR	000000	000000	MAIN	TASK
GEN	100000	360000	MAIN	SYS
TPSPAR	460000	240000	MAIN	SYS
TPMLIB	720000	020000	MAIN	COM
TSTLIB	740000	010000	MAIN	COM
MESS	750000	010000	MAIN	COM

VMR COMMANDS

REASSIGN

REA

The REASSIGN command allows the operator to reassign a task's Logical Unit Numbers (LUNs) from one physical device-unit to another. The reassignments affect only the static assignments recorded in the task's disk image file.

The command does not affect a memory-resident task. Hence, REASSIGN has no effect on the assignments for a task that is fixed or loaded in memory.

The format of the REASSIGN command is:

```
REA[SSIGN] taskname lun nud:
```

where:

lun is the logical unit number

nud is the new device-unit, which can be a physical, logical, or pseudo device.

Examples:

```
VMR>REA JOE 3 TT0:
```

Reassign LUN 3 of task JOE to device TT0:.

```
VMR>REA BILL 2 TT1:
```

Reassign LUN 2 of task BILL to device TT1:.

```
VMR>REA TEST 3 XX:
```

Reassign LUN 3 of task TEST to logical device XX:.

Command Error Messages:

```
VMR -- ILLEGAL OPERATION FOR SAVED SYSTEM
```

The REASSIGN function is not allowed for a saved system image.

```
VMR -- LUN OUT OF RANGE
```

An attempt was made to reassign a LUN that was greater than the maximum number of LUNs allocated during task build.

VMR COMMANDS

REDIRECT

RED

The REDIRECT command allows the operator to redirect all I/O requests directed to one physical device-unit to another physical device-unit.

Note that an attached device and the device TI: cannot be redirected. In addition, one pseudo device cannot be redirected to another pseudo device.

The format of the REDIRECT command is:

```
RED[IRECT] nud:=old:
```

where:

nud: is the new device-unit to which requests will be redirected.

old: is the old device-unit from which requests have been directed.

Examples:

```
VMR>RED TT3:=TT6:
```

Redirect all I/O requests for device TT6: to device TT3:.

```
VMR>RED TT:=LP:
```

Redirect all I/O requests for device LP0: to device TT0:.

Command Error Messages:

```
VMR -- CIRCULAR REDIRECT ERROR
```

The attempt to redirect a device would result in a circular list of redirections.

```
VMR -- DEVICE NOT REDIRECTABLE
```

An attempt was made to redirect a device that cannot be redirected.

```
VMR -- DEVICE ddnn: NOT IN SYSTEM
```

The specified device in the REDIRECT command was not known to the system (did not exist in the device tables).

```
VMR -- OLD DEVICE ATTACHED
```

An attempt was made to redirect an attached device.

VMR COMMANDS

VMR -- PSEUDO DEVICE REDIRECT ERROR

An attempt was made to redirect one pseudo device to another pseudo device.

VMR -- TI REDIRECT ERROR

An attempt was made to redirect the pseudo device TI:. This device may not be redirected.

VMR COMMANDS

REMOVE

REM

The REMOVE command allows you to delete a task name from the System Task Directory (STD) and thereby remove the task from the system image. Removing a task from the system image makes the task unknown to the system. The action resulting from this command is the complement of INSTALL.

The REMOVE command cannot remove an active task from a saved system. An example of such a task is the SAVE task; an attempt to remove SAVE from a saved system results in an error. The message TASK ACTIVE is displayed.

The format of the REMOVE command is:

```
REM[OVE] taskname
```

Example:

```
VMR>REM SCAN
```

Remove the task named SCAN from the system image. The task-image file remains unaffected.

Notes:

- If a task that is the object of a REMOVE command is fixed, the command automatically unfixes the task from the system image.
- REMOVE automatically cancels all time-based schedule requests for the specified task.
- REMOVE cannot deallocate any receive-by-reference and receive-data packets for the task.

Command Error Message:

```
VMR -- RECEIVE DATA OR BY REFERENCE LIST NOT EMPTY
```

A task with entries in its receive queues may not be removed from the system image.

VMR COMMANDS

RUN

RUN

The RUN command initiates the execution of a task. The command can cause a task to be:

- Started one clock tick after system boot,
- Started at a time increment from the system image time,
- Started at a time increment from clock unit synchronization,
- Started at an absolute time of day.

All these options, are available with or without rescheduling.

RUN has four format variations, as described below.

The formats of the RUN command are:

1. Run one clock tick after system boot.

RUN taskname [/RSI=magu][/UIC=[uic]]

where:

taskname is a 1- to 6-character taskname.

RSI is the reschedule interval. The format is the same as for dtime, which is detailed below under format 2. The reschedule interval specifies how often the task is to be rerun. Thus, each time the specified interval of time lapses, an initiation request is made for the specified task.

Default: no rescheduling.

UIC is the UIC that has the format [g,m] where g and m represent the group and member numbers respectively; legal group and member numbers range from 1 through 377(8). The square brackets are required syntax. This is the UIC under which the task is requested. The UIC determines which files the task may access.

Default: the value established for terminal CO:.

2. Run at a time increment from the system image time.

RUN taskname dtime [/RSI=magu][/UIC=[uic]]

where:

taskname is a 1- to 6-character taskname.

dtime is the time at which the task is initiated in time units from current system image time. It follows the form magu.

VMR COMMANDS

A time parameter consists of two fields:

- a. A magnitude field, and
- b. A units field.

where:

mag is the magnitude
u specifies time units as one of the following letters:

T
S
M
H

The legal value of the magnitude is related to the value of the units field, which is encoded as:

T for ticks. A tick is a clock interrupt, and the rate at which interrupts occur depends on the type of clock installed in the system.

For a line frequency clock, the tick rate is either 50 or 60 per second, corresponding to the line frequency.

For a programmable clock, a maximum of 1000 ticks per second is available. (The frequency is selected at system generation.)

S for seconds.

M for minutes.

H for hours.

The magnitude is the number of units to be clocked, but the magnitude value cannot exceed 24 hours in the specified units.

Units = T. Any positive value is valid (maximum of 15 bits).

Units = S. Any positive value is valid (maximum of 15 bits).

Units = M. The maximum magnitude is 1440(10).

Units = H. The maximum magnitude is 24(10).

RSI See Format 1, above.

UIC See Format 1, above.

VMR COMMANDS

3. Run at a time increment from clock unit synchronization.

The task start-time is determined by computing the number of ticks until the next time unit's occurrence (hour, minute, second, tick) and then adding on the number of ticks for the specified time increment to elapse.

```
Run taskname sync [dtime] [/RSI=magu] [/UIC=[uic]]
```

where:

taskname is a 1- to 6-character taskname.

sync H = synchronize on the next hour;
M = synchronize on the next minute;
S = synchronize on the next second, and
T = synchronize on the next tick.

dtime is as defined in Format 2, above; dtime, if present, is added to the synchronization unit to produce the actual run time for running the task.

RSI See Format 1, above.

UIC See Format 1, above.

4. Run at an absolute time of day.

```
RUN taskname atime [/RSI=magu] [/UIC=[uic]]
```

where:

taskname is a 1- to 6-character taskname.

atime is the absolute time of day when this task will be initiated. Input format is hh:mm:ss.

hh = hours (decimal assumed);
mm = minutes (decimal assumed), and
ss = seconds (decimal assumed).

RSI See Format 1, above.

UIC See Format 1, above.

Examples:

```
>RUN XKE 15M
```

Run task XKE 15 minutes from the current system image time.

```
>RUN XKE 15M/RSI=90S/UIC=[3,1]
```

Run task XKE 15 minutes from the current system image time, rescheduling it every 90 seconds, with a UIC code of [3,1].

Note:

- The correct value to be inserted in the clock for forms 2 through 4 is computed from the current value of the system time stored in the system image. Thus, the system image time must be set before any RUN requests are made or they may not occur at the correct time after the system is booted.

VMR COMMANDS

Command Error Messages:

VMR -- INVALID TIME PARAMETER

A specified time field was incorrect.

VMR COMMANDS

SAVE

SAV

The VMR SAVE command writes the image of a system onto a sequential medium in bootstrappable format. This command allows you to copy an RSX-11S or foreign system (see /IM switch) onto a tape or floppy disk that you can transport to another system and bootstrap using a hardware bootstrap or the /BO switch in PRESRV.

System images created with the SAVE command on all media, except paper tape, are in a format compatible with the logical tape format in PRESRV. Thus, any of PRESRV's logical tape operations can be performed on system images created with the SAVE command. System images created by the SAVE command always start at the beginning of the medium.

On paper tape, system images are created in absolute loader format and must be bootstrapped with the absolute loader.

The format of the SAVE command is:

```
SAV[E] ddnn:[label]
```

where:

ddnn: specifies the device-unit onto which the system image is to be written. Valid devices are:

CT: Tape cassette,
DT: DEctape,
DX: Flexible diskette,
MM: TE/TU16/TU45 magtape,
MT: TE/TU10/TS03 magtape, and
PP: Paper tape.

label is the file label name that must be specified for all secondary media except paper tape. It consists of from one to twelve alphanumeric characters.

Example:

```
VMR>SAV MT:MYSYS
```

In the example above, the system image is written onto MT: in bootstrappable format. System changes made by other VMR commands are also saved with the system image.

Notes:

- When the /LI command is used in PRESRV to list a medium (other than paper tape) containing a system image created with the SAVE command, each system image causes a line to be printed which contains the following: VM (for VMR), indicated as the source device, the label specified in the SAV command line, a block size of 512, the number of 512-byte blocks in the system image (excluding boot and label blocks), and the date and time that the system was saved.
- When RSX-11S systems are saved on paper tape (without the /IM switch specified at VMR initiation time), the last 1000(8) bytes of the system image are not written out. This allows space to accommodate the absolute loader. When the /IM switch

VMR COMMANDS

has been specified with the system's file name, the entire system image is written out to paper tape. In this case, it is your responsibility to ensure that the system image is not so large that it overlays the Absolute Loader.

- When saving a system on paper tape, contiguous blocks that contain zero only and that begin on a 32-word address are compressed into a 2-word descriptor. This compression significantly reduces both the amount of paper tape required and the time expended to create the tape and to read it into memory. After the entire image has been loaded into memory, a short routine zeroes the appropriate blocks of memory before passing control to the bootstrapped system.
- When bootstrapping systems on media other than paper tape, regardless of the size of the system image, the last 1000(8) bytes of physical memory are not copied to accommodate the bootstrap.
- Systems saved on a TE/TU10/TS03, 9-track magtape drive can be booted from a TE/TU16 drive, and vice-versa.
- When the /IM switch has been specified with the system file specifier, the SAVE command always uses a bootstrap that does not enable memory management.
- The maximum memory size of a mapped system is 124K words. For physical and practical limitations, the SAVE command imposes maximum sizes on saved images in mapped systems for certain devices. If a mapped system is saved, whose memory size is greater than the maximum size imposed by the SAVE command for the specified device, only the amount of memory equal to the maximum size (starting at physical location 0) is saved; no diagnostic message is issued. The devices for which the SAVE command imposes a maximum size on saved system images are:

Paper tape punch (PP) - 28K words,

Flexible disk (DX) - 123K words, and

Cassette tape (CT) - 28K words.

- None of the bootstraps require that the target RSX-11S system have a driver for the bootstrap device.

Command Error Messages:

VMR -- DEVICE ddn: NOT IN SYSTEM

The specified device does not exist on the host system.

VMR -- ILLEGAL DEVICE VOLUME

The specified device was other than one of the valid devices specified above.

VMR -- I/O ERROR ON OUTPUT DEVICE

An I/O error was encountered on the output device while writing the system image.

VMR COMMANDS

SET

SET

The SET command allows you to alter a number of system-wide characteristics. The following list describes all the available options. The text in parentheses specifies keywords associated with the options. The SET command allows you to:

- Display the status (determined by the keyword specified) of all terminals.
- Establish device characteristics for any device in the system (BUF, CRT, ESCSEQ, LA30S, LA180S, LOWER, REMOTE, SPEED, and VT05B),
- Establish the default UIC for any terminal in the system (UIC),
- Set the status of any terminal in the system (PRIV or SLAVE),
- Create partitions or subpartitions (MAIN and SUB),
- Add space to the system dynamic memory (POOL),
- Enable write check on devices that support it (WCHK).

Improper use of the SET command can result in a situation in which privileged operator input is not accepted. The following two situations should be avoided:

- There are no non-slave, privileged terminals in the system. Non-privileged terminals cannot enter privileged commands. Slaved terminals cannot enter unsolicited input to MCR. See the description of the /SLAVE keyword below.
- The buffer length of all non-slave, privileged terminals is shorter than 14 bytes. In this case, the terminal buffer is too short to enter many important commands required to continue system operation or alter the status of other terminals. See the description of the /BUF keyword below.

A number of SET command options (CRT, ESCSEQ, LOWER, and WCHK) require Executive features that must be included at system generation. If support for a specified option has not been generated into the system image, the SET command has no effect.

Only one keyword per command is permitted. Most keywords can be prefixed by NO to negate or disable the function of the keyword. Exceptions are BUF, POOL, SPEED, and UIC; VMR returns a syntax error whenever NO precedes one of these keywords.

The format of the SET command is:

```
SET /keyword=values
```

Device Characteristics Keywords:

```
/BUF=dev:[size]
```

```
/CRT[=ttn:]
```

VMR COMMANDS

/ESCSEQ [=dev:]
/LA30S [=dev:]
/LA180S [=dev:]
/LOWER [=dev:]
/PRIV [=dev:]
/REMOTE [=dev:]
/SLAVE [=dev:]
/SPEED=dev:[recv:xmit]
/UIC [=uic[:dev:]]
/VT05B [=dev:]
/WCHK [=dev:]

Keyword Definitions:

- BUF /BUF=dev:[size]. Set or display the default buffer size of the specified device. If the buffer size is omitted, this keyword causes the current size to be displayed. The specified size must be greater than 0 and less than or equal to 255 decimal (for a terminal, the buffer size must be greater than or equal to two). BUF is particularly useful for defining line printer width (80 or 132 columns).
- CRT /CRT [=dev:] where dev: is a cathode ray tube (CRT) terminal. The CRT keyword defines the terminal as a CRT and enables the backspace deletion option. Typing the RUBOUT or DELETE key moves the printing position one space to the left and erases any character displayed in that position.
- When the keyword omits =dev:, VMR displays all the devices that are defined as CRTs.
- NOCRT /NOCRT [=dev:] where dev: is a cathode ray tube (CRT) terminal. The NOCRT keyword deletes the CRT status of the specified device and disables the backspace deletion option.
- When the keyword omits =dev:, VMR displays all the terminals that are not defined as CRTs.
- ESCSEQ /ESCSEQ [=dev:] where dev: is a terminal. The ESCSEQ keyword enables the recognition of escape sequences from the specified terminal. The terminal driver treats the ESC character as the beginning of an escape sequence rather than as a line terminator. See the RSX-11M I/O Drivers Reference Manual for further information about escape sequences.
- When the keyword omits =dev:, VMR displays all the terminals that recognize escape sequences.

VMR COMMANDS

NOESCSEQ /NOESCSEQ[=dev:] where dev: is a terminal. The NOESCSEQ keyword disables the recognition of escape sequences at the specified terminal.

When the keyword omits =dev:, VMR displays all the terminals that do not support the recognition of escape sequences.

LA30S /LA30S[=dev:]. Establishes the specified terminal device as an LA30S and generates fill characters required for an LA30S. If =dev: is omitted, all terminals defined as LA30S are displayed.

NOLA30S /NOLA30S[=dev:]. Resets the terminal to a device other than an LA30S. If =dev: is omitted, all non-LA30S terminals are displayed.

LA180S /LA180S[=dev:]. Establishes the specified terminal device as an LA180S and causes the terminal driver to suppress normal conversion of form feeds to 8 line feeds. If the keyword omits =dev:, all terminals defined as LA180S are displayed.

NOLA180S /NOLA180S[=dev:]. Resets the terminal to a non-LA180S device. If the keyword omits =dev:, all non-LA180S terminals are displayed.

LOWER /LOWER[=dev:]. Specifies that lower-case characters are not to be converted to upper case when they are received from the specified terminal. If =dev: is omitted, all terminals for which lower-case characters are not converted are displayed.

NOLOWER /NOLOWER[=dev:]. Resets the terminal characteristics so that lower-case characters received on input are automatically converted to upper case and echoed as upper case. Absence of =dev: results in the display of all terminals for which conversion to upper case is specified.

PRIV /PRIV[=dev:]. Sets the specified terminal to privileged status. If =dev: is omitted, VMR displays all privileged terminals.

NOPRIV /NOPRIV[=dev:]. Sets the identified terminal to nonprivileged status. Absence of =dev: results in a display of all nonprivileged terminals.

REMOTE /REMOTE[=dev:] where dev: is a terminal with a line to a DZ11 multiplexer. The keyword declares that the specified terminal is connected to a modem and can be connected by means of a dial-up network.

When the keyword omits =dev:, VMR displays all remote lines (including DH11 lines).

NOREMOTE /NOREMOTE[=dev:] where dev: is a line to a DZ11 multiplexer. The NOREMOTE keyword establishes the terminal's line as a local line not connected to a modem.

When the keyword omits =dev:, VMR displays all local lines (including DL11, DH11, DJ11, and DZ11 multiplexers).

VMR COMMANDS

- SLAVE** /SLAVE[=dev:]. Establishes the specified terminal as one that can enter data only if it is solicited from a task; thus, the specified terminal always rejects unsolicited input (other than CTRL/O, CTRL/Q, and CTRL/S). Absence of dev: results in the display of all terminals currently classified as slaved.
- NOSLAVE** /NOSLAVE[=dev:]. Sets the specified terminal to nonslave status. Absence of =dev: results in the display of all nonslave terminals.
- SPEED** /SPEED=dev:[recv:xmit]. Establishes the receive and transmit baud rate for terminals attached to the system through a DH11 or DZ11 multiplexer. The argument "recv" is the baud rate at which characters are input to the computer from the terminal; and "xmit" is the baud rate at which the computer outputs characters to the terminal. Both must be specified in setting the speed. If neither is specified, the current settings are displayed.
- Valid baud rates for the DH11 are: 0, 110, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, A (user-specified baud rate A), and B (user-specified baud rate B).
- Valid baud rates for the DZ11 are: 0, 110, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, and 9600. The receive and transmit baud rates for the DZ11 must be the same; the DZ11 does not support split speeds.
- UIC** /UIC[=uic[:dev:]]. The specified UIC is established as the default UIC for the entering terminal unless dev: is specified. If you specify dev:, the default UIC is set for that terminal. All tasks run from the terminal are run with the UIC of the terminal, except in a multiuser protection system. In such a system, a privileged user can override the terminal UIC with the UIC switch in the RUN command. Further, external MCR function tasks* are requested with this UIC.
- If a UIC is not specified, the current UIC is displayed. If only dev: is specified, the UIC for the specified terminal is displayed.
- VT05B** /VT05B[=dev:]. Sets the specified terminal as a VT05B (a 2400 baud VT05) and generates fill characteristics of a VT05B. If =dev: is omitted, all terminals classified as VT05B are displayed.
- NOVT05B** /NOVT05B[=dev:]. Resets the terminal to other than a VT05B. If =dev: is omitted, all terminals classified as non-VT05B terminals are displayed.
- WCHK** /WCHK[=dev:]. Specifies for all Files-11 devices except DX: and DL: and magnetic tape (MM: and MT:) that all writes are to be followed by a write check. This feature provides high reliability for data transfers to the specified disk. Executive support for write check is a SYSGEN option and must be selected for

* These tasks are the MCR MOUNT, INSTALL, DMO, and UFD commands (which run as tasks) and all system-supplied software.

VMR COMMANDS

this command to have any effect. If =dev: is omitted, all Files-11 disk drives with write check enabled are displayed.

NOWCHK /NOWCHK[=dev:]. Specifies that write check is to be disabled for the specified device. If =dev: is not specified, all disks that support write check, but have it disabled are displayed.

Examples:

```
>SET /BUF=LP0:  
BUF=LP0:132.
```

Display the current buffer size of LP0:

```
>SET /BUF=TT1:40.
```

Set TT1: buffer size to 40(10).

```
>SET /CRT=TT3:
```

Enable the backspace deletion option on the display terminal identified by TT3:.

```
>SET /CRT  
CRT=TT3:
```

Display all terminals that support the backspace deletion option.

```
>SET /ESCSEQ=TT3:
```

Establish terminal TT3: as a terminal that can send and receive escape sequences.

```
>SET /ESCSEQ  
ESCSEQ=TT3:
```

Display all terminals that can send and receive escape sequences.

```
>SET /NOESCSEQ=TT3:
```

Disable support of escape sequences on TT3:.

```
>SET /LA30S=TT2:  
>SET /LA30S  
LA30S=TT0:  
LA30S=TT2:
```

Set TT2: as an LA30S.
Display all LA30S terminals.

```
>SET /NOLA30S=TT0:
```

Set TT0: to other than an LA30S terminal.

VMR COMMANDS

>SET /PRIV=TT0:

Set TT0: to a privileged terminal.

>SET /PRIV
PRIV=TT0:
PRIV=TT1:

Display all privileged terminals.

>SET /REMOTE=TT21:

Set the terminal line corresponding to TT21: as a remote dial-in line. The line must be connected to a DZ11 multiplexer.

>SET /REMOTE
REMOTE=TT1:
REMOTE=TT2:
REMOTE=TT3:
REMOTE=TT4:
REMOTE=TT21:

Display all terminals that are currently set as remote dial-in lines. TT1:, TT2:, TT3:, and TT4: are DH11 lines; TT21: is a DZ11 line.

>SET /SLAVE=TT3:

Set TT3: to a slave terminal.

>SET /VT05B
VT05B=TT4:
VT05B=TT5:
VT05B=TT6:

Display all VT05B terminals.

>SET /WCHK=DK1:

Enable write check on DK1:.

Memory Allocation Keywords:

/MAIN=pname[:base:size:type]

/NOMAIN=pname

/SUB=mname:pname[:base:size]

/NOSUB=mname:pname

/POOL[=top]

These keywords are used as follows:

MAIN The MAIN keyword establishes a main partition.

VMR COMMANDS

`pname` is the 1- to 6-character alphanumeric partition name.

`:base` is the physical base address of the partition specified as a number of 64-byte blocks.

`:size` is the size of the partition specified as a number of 64-byte blocks. The maximum size is 32K minus 32 words for a task, common, main, or sub partition unless the system has memory management.

`:type` is TASK for a user-controlled task partition,
is SYS for a system-controlled task partition,
is COM for a common partition, or
is DEV for a common partition mapping into the device registers.

User-controlled and system-controlled task partitions are allocated for user tasks and loadable drivers. Common partitions are used for resident libraries and common blocks. Device partitions are used by nonprivileged tasks to access device registers in the external page, such as those for the UDC-11 and ICS/ICR-11.

Base and size may be entered in any of the following formats; where `nnnn` is a number to which a multiplication factor is applied to determine the value used.

Format	Calculated Value
<code>nnnn</code>	Octal (<code>nnnn*100</code>)
<code>nnnn.</code>	Decimal (<code>nnnn.*64.</code>)
<code>nnnK</code>	Octal K (<code>nnn*4000</code>)
<code>nnn.K</code>	Decimal K (<code>nnn.*2048.</code>)

Valid ranges of calculated values are:

Octal	<code>0<=base<177777</code>	<code>0<size<2000</code>
Decimal	<code>0.<=base<65535</code>	<code>0.<size<1024.</code>
Octal K	<code>0K<=base<3777K</code>	<code>0K<size<40K</code>
Decimal K	<code>0.K<=base<2047.K</code>	<code>0.K<size<32.K</code>

For system-controlled partitions, size may range from 0 to 1920.K or any valid representation of these limits.

Example:

Any of the following inputs for size will allocate a 1920. byte partition.

40
32.
1K
1.K

If the command does not specify base, size, and type, VMR displays the values of these parameters for the named partition. If the named partition is a main partition, VMR also displays the parameters of all its subpartitions.

VMR COMMANDS

NOMAIN is the keyword that eliminates the named partition from the system.

SUB is the keyword that establishes a subpartition. Subpartitions may only be established in user-controlled main partitions.

mname is the 1- to 6-character main partition name. The subpartition being defined becomes a subpartition in the named main partition.

:pname is the 1- to 6-character subpartition name. The subpartition being defined becomes a subpartition of the main partition specified in mname.

:base is the physical base address of the subpartition, specified as a number of 64-byte blocks.

:size is the size of the subpartition, specified as a number of 64-byte blocks.

Base and size may be entered in any of the following formats; nnnn is a number to which a multiplication factor is applied to determine the value used.

Format	Calculated Value
nnnn	Octal (nnnn*100)
nnnn.	Decimal (nnnn.*64.)
nnnK	Octal K (nnn*4000)
nnn.K	Decimal K (nnn.*2048.)

Valid ranges of values are:

Octal	0<=base<10000	0<size<2000
Decimal	0.<=base<4096.	0.<size<1024.
Octal K	0K<=base<200K	0K<size<40K
Decimal K	0.K<=base<2047.K	0.K<size<32.K

Example:

Any of the following inputs for size will allocate a 2048. byte subpartition.

40
32.
1K
1.K

If base and size are omitted, the current values will be displayed for the named subpartition.

NOSUB is the keyword that eliminates the named subpartition from the system.

VMR COMMANDS

POOL is the keyword that increases the size of the dynamic storage region.

top is the first location in memory used for partition allocation. The location is specified in units of 64-byte blocks. It can be given in octal or decimal. If top is not given, the system prints out the current top of memory, the size of the longest block of pool space in words, and the total number of words in the pool.

The format is:

POOL = top:max:total

where top is given in units of 64-byte blocks. Max and total are in decimal words.

Notes:

- If a partition currently hosts installed tasks or loaded drivers, and a command (for example, /NOMAIN or /NOSUB) attempts to eliminate the partition, VMR rejects the command.
- A command that eliminates a main partition also eliminates all its subpartitions. A command that eliminates a specified subpartition eliminates only that specified subpartition.
- If a command attempts to eliminate a main partition that has subpartitions in which tasks are installed or drivers loaded, the system rejects the command until those tasks are removed from the subpartitions.
- When defining a partition (main or sub) the name must not already be defined as a partition. In addition, a main partition can not overlap any other main partition; nor can a subpartition of a main partition overlap any other subpartition of the main partition.
- The numeric value convention applies to all the SET command numeric values.
- The address specified with the POOL command must be lower than the base address of the first partition in the system with the exception of partition LDR.
- Once space has been allocated to the dynamic storage region, the space can never be recovered for use in partitions.
- System-controlled partitions can not include subpartitions explicitly defined by the SET command. An attempt to define subpartitions of system-controlled partitions in this way will be rejected. The Executive dynamically defines subpartitions of a system-controlled partition as needed to load tasks and drivers in the system-controlled partition.
- When the highest memory addresses of a system are allocated to a system-controlled partition, the size of the partition is modified automatically to reflect the amount of memory present when the system is bootstrapped.

VMR COMMANDS

Examples:

```
>SET /MAIN=SYSPAR:420:140:TASK
```

Define a main partition called SYSPAR as a user-controlled partition whose base address is 42000(8) and whose length is 14000(8) bytes.

```
>SET /SUB=SYSPAR:MCRPAR:445:56
```

Define a subpartition called MCRPAR of main partition SYSPAR whose base address is 44500(8) and whose length is 5600(8) bytes.

```
>SET /MAIN=SYSPAR  
MAIN=SYSPAR:0420:0140:TASK  
SUB=SYSPAR:MCRPAR:0445:0056
```

Display the parameters of the main partition SYSPAR and all of its subpartitions.

```
>SET /NOSUB=SYSPAR:MCRPAR
```

Eliminate subpartition MCRPAR.

```
>SET /NOMAIN=SYSPAR
```

Eliminate main partition SYSPAR.

```
SET /MAIN=GEN:1000:6000:SYS
```

Define a main partition called GEN as a system-controlled partition whose base address is 100000(8) and whose length is 600000(8) bytes.

```
>SET /POOL=420
```

(No user defined partition can be to 42000(8)).

```
>SET /POOL
```

```
POOL=0420:150:430.
```

The first available location for user partitions is 42000; the longest free block is 150. words, and the total of all pool space is 430. words.

Command Error Messages:

```
VMR -- ALIGNMENT ERROR
```

An attempt was made to create a partition, but the base address or size conflicted with existing partitions or physical memory size.

VMR COMMANDS

VMR -- DEVICE NOT VARIABLE SPEED MULTIPLEXER

An attempt was made to set the baud rate for a terminal that was not attached to a DH11 or DZ11 multiplexer.

VMR -- DEVICE NOT TERMINAL

An attempt was made to set terminal characteristics for a nonterminal device.

VMR -- INVALID SPEED

The multiplexer line specified does not support the requested speed; or the command specified unequal receive and transmit speeds for a DZ11. The DZ11 does not support split speeds.

VMR -- LINE NOT DZ11

The command attempted to set to remote a line that was not attached to a DZ11 multiplexer.

VMR -- NON EXISTENT MEMORY

An attempt was made to define a partition in nonexistent memory.

VMR -- PARTITION ALREADY EXISTS

An attempt was made to define a partition with a name already in use.

VMR -- PARTITION BUSY

A task or a driver is installed or loaded in the specified partition or subpartition.

VMR -- POOL LINK ERROR AT xxxx BLOCK=yyyy zzzz

When SET /POOL traced the pool linkage, it detected an error at location xxxx in the system image. The contents of xxxx is yyyy and the contents of xxxx+2 is zzzz.

VMR -- SPACE USED

An attempt was made to create a partition or subpartition in a storage area already occupied.

VMR -- TOO MANY SUBPARTITIONS

An attempt was made to define more than seven subpartitions. A main partition is limited to a maximum of seven subpartitions.

VMR COMMANDS

VMR -- UNKNOWN MAIN PARTITION

An attempt was made to define a subpartition of a nonexistent main partition.

VMR -- WRITE CHECK NOT SUPPORTED FOR DEVICE

An attempt was made to enable write check on a device that does not support it. Write check is currently supported for all disks except DL: and DX:.

VMR COMMANDS

TASKLIST

TAS

The TASKLIST command displays a description of each installed task on the entering terminal. The display contains in columnar form, from left to right:

1. Task name,
2. Task version identification,
3. Partition name,
4. Task priority,
5. Size of task in bytes (octal),
6. Load device identification,
7. Disk address logical block number (octal), in a virgin system image or task file identification in a saved system image, and
8. Task memory state.

The format of the TASKLIST command is:

TAS[KLIST]

Example:

```
VMR>TAS
. LDR.          LDR      248. 000000 LB0:-00000000 FIXED
TKTN   03       SYSPAR  248. 010000 LB0:-00657407
RMDEMO M03     GEN      225. 013400 LB0:-00662334
MTAACP 0005    GEN      200. 012600 LB0:-00677004
FllMSG V0010   SYSPAR  200. 010000 LB0:-00666657
...MCR 02      SYSPAR  160. 010000 LB0:-00657050
...SYS 01      GEN      160. 010000 LB0:-00657202
...HEL 01      GEN      150. 040000 LB0:-00655150
...BYE 01      GEN      150. 040000 LB0:-00655117
FllACP MM0234  FCPPAR  149. 026000 LB0:-00724342
DTAACP MS0234 GEN      149. 010000 LB0:-00667662
...DMO 03      GEN      140. 040000 LB0:-00655177
...INI 03      GEN      140. 040000 LB0:-00655206
...MOU 03      GEN      140. 040000 LB0:-00657271
...UFD V0407   GEN      140. 040000 LB0:-00657416
PMD... 03      PMDPAR  130. 020000 LB0:-00666610
```

On a system image generated for on 11/70 with more than 124K words of memory, the size field (fifth column) contains 8-digit rather than 6-digit numbers. This display is for a virgin system image.

FIXED indicates that the task is fixed in memory.

```
VMR>TAS
. LDR.          LDR      248. 000000 LB0:- FILE ID:(0,0) FIXED
TKTN   SYSPAR  248. 010000 LB0:- FILE ID:(2572,11)
...MCR SYSPAR  160. 010000 LB0:- FILE ID:(2563,11)
...SYS  GEN     160. 010000 LB0:- FILE ID:(2565,11)
FllACP FCPPAR  149. 026000 LB0:- FILE ID:(2576,11)
...DMO  GEN     140. 040000 LB0:- FILE ID:(2556,11)
...INI  GEN     140. 040000 LB0:- FILE ID:(2557,11)
...MOU  GEN     140. 040000 LB0:- FILE ID:(2567,11)
...UFD  GEN     140. 040000 LB0:- FILE ID:(2573,11)
PMD... PMDPAR  130. 020000 LB0:- FILE ID:(2610,12)
SHF... SYSPAR  105. 010000 LB0:- FILE ID:(2606,11)
...INS  GEN     100. 040000 LB0:- FILE ID:(2562,11)
```

VMR COMMANDS

```
...SAV  GEN      100. 040000 LB0:- FILE ID:(2570,11)
...BAD  GEN      100. 040000 LB0:- FILE ID:(6162,34)
PRT...  PMDPR     70. 020000 LB0:- FILE ID:(5210,6)
...BOO  GEN       50. 040000 LB0:- FILE ID:(2273,30)
...ACS  GEN       50. 040000 LB0:- FILE ID:(1066,22)
...PIP  GEN       50. 054300 LB0:- FILE ID:(2627,11)
...PSE  GEN       50. 031600 LB0:- FILE ID:(5552,4)
...AT.  GEN        1. 040000 LB0:- FILE ID:(5013,4)
```

The above display is from a saved system. It differs from a virgin system in two ways: the task version is not displayed and the file id of the task file, rather than the logical block number is displayed.

VMR COMMANDS

TIME

TIM

The TIME command allows you to:

- Set the time of day,
- Set the date, or
- Display the time and date.

The format of the TIME command is:

```
TIM[E] [hrs:mins[:secs]] [m1/day/year]
```

or

```
TIM[E] [hrs:mins[:secs]] [day-m2-year]
```

where:

hrs	hours (range 0-23)
mins	minutes (range 0-59)
secs	seconds (range 0-59) (optional)
m1	numeric representation of month (range 1-12)
m2	3-letter abbreviation for month
day	day (range 1-31)
year	year (range 0-99). Year is relative to 1900; thus, 1977 is entered as 77.

- If the command specifies neither time nor date, it displays the current system image time and date.
- If the command specifies the time and date, it sets the system image clock and calendar. If only the time is specified, only the clock is set; if only the date is specified, only the calendar is set.
- The time and date can be specified in any order.
- All numeric values are decimal. No terminating period is necessary (nor permitted).

Examples:

```
>TIM  
10:23:31 03-NOV-77
```

Display the current system image time and date.

```
>TIM 1:30 11/4/77
```

Set the time to 01:30:00 and the date to 04-NOV-77

VMR COMMANDS

UNFIX

UNF

The UNFIX command allows you to free a fixed task from the system image. UNFIX is the complement of the FIX command.

If a fixed task exits or aborts, it still occupies the system image memory of the partition.

Format:

UNF[IX] taskname

Example:

>UNFIX xke

Unfix task XKE, freeing the partition in which it resides.

Command Error Messages:

VMR -- TASK NOT FIXED

An attempt was made to unfix a task that was not fixed.

VMR COMMANDS

UNLOAD

UNL

The UNLOAD command removes a loadable device driver from the system image. If a device is attached, its driver cannot be unloaded.

To unload a device driver from the system image, the driver's STB file must reside on the same disk and under the same UIC as the system image file.

The UNLOAD command cannot remove a data base from the system image, even if the data base was loaded by means of the LOAD command.

The format of the UNLOAD command is:

```
UNL[OAD] dd:
```

where:

```
dd:      is a 2-character ASCII device name
```

Example:

```
VMR>UNL LS:      !UNLOAD LPS11 DRIVER (LSDRV)
```

Command Error Messages:

```
VMR -- DEVICE ddn: NOT IN SYSTEM
```

No such device existed in the system.

```
VMR -- DEVICE ddn: IS ATTACHED
```

One or more device-units handled by the driver are attached. The first such unit is ddn:, therefore, the driver cannot be unloaded.

```
VMR -- DRIVER BUILT WITH WRONG STB FILE
```

The STB file for the driver was not compatible with the current Executive.

```
VMR -- DRIVER CAN NOT BE UNLOADED
```

The UNLOAD command attempted to remove a permanently resident device driver (that is, a driver linked to the Executive).

```
VMR -- DRIVER NOT LOADED
```

The specified device driver in the UNLOAD command was not resident in memory.

```
VMR -- FILE name HAS ILLEGAL FORMAT
```

The driver's STB file contained incorrect object code or data.

VMR COMMANDS

VMR -- ILLEGAL VALUE FOR SYMBOL symname IN FILE name

The symbol symname has been defined to an illegal value by the file name. This occurs for several reasons, some general and some specific to the individual symbols. For example, most symbols cannot be defined to zero and mapped loadable drivers cannot reference \$INTSV.

VMR -- INVALID RECORD ADDRESS FOR FILE name

An attempt was made to write outside of the system image file or to write beginning at a byte boundary. The most frequent cause of this is a corrupted system image or an STB file that does not match the system image.

VMR -- LOADABLE DRIVER SUPPORT NOT IN SYSTEM

The system generation option to support loadable device drivers was not chosen for the current system image.

VMR -- SYMBOL symname IS DOUBLY DEFINED BY FILE name

The symbol symname is defined twice by the filename. Duplicate symbols are illegal.

VMR -- SYMBOL symname IS UNDEFINED IN FILE name

The symbol symname was found in the file name, but it was not a symbol definition.

5.7 VMR ERROR MESSAGE SUMMARY

All error messages produced by VMR appear in this section in alphabetical order.

VMR -- ADDRESSING EXTENSIONS NOT SUPPORTED

The command tried to install a task with a VSECT (virtual section) into a system image that does not support the feature.

VMR -- ALIGNMENT ERROR

The command tried to create a partition, but the base address or size conflicts with existing partitions or physical memory size.

VMR -- BASE ADDRESS MUST BE ON 4K BOUNDARY

The base address of the task is not on a 4K boundary. Applicable only to mapped system images.

VMR -- BASE MISMATCH COMMON BLOCK <common-name>

The base address of the partition does not match that of the common block. Applicable only to unmapped system images.

VMR COMMANDS

VMR -- CANNOT FIX A TASK IN A SYSTEM CONTROLLED PARTITION

This is a restriction of VMR. To fix a task in a system controlled partition, use the MCR FIX command and then SAVE the system image.

VMR -- CHECKPOINT AREA TOO SMALL

The area allocated for checkpointing in the task image file is smaller than the partition into which the task is being installed. The system image does not support the dynamic allocation of checkpoint space.

VMR -- CHECKPOINT SPACE TOO SMALL, USING CHECKPOINT FILE

This is a warning message. The checkpoint space allocated in the task image file is too small for the size of the task (usually because of the /INC keyword). The system image supports the dynamic allocation of checkpoint space and therefore uses a checkpoint file to contain the rolled-out task.

VMR -- CIRCULAR REDIRECT ERROR

The command tried to redirect a device such that a circular list of redirected devices would result.

VMR -- COMMAND I/O ERROR

An I/O error was detected during a read from an indirect file.

VMR -- COMMAND SYNTAX ERROR

command line

The command line printed has incorrect syntax.

VMR -- COMMON BLOCK IS TASK PARTITION <common-name>

A task's request for access to a common block is rejected because the partition requested is a task partition.

VMR -- COMMON BLOCK NOT LOADED <common-name>

The specified common block is linked to the task, but it has not been loaded into the system image. Install the specified common block, then install the task.

VMR -- COMMON BLOCK OCCUPIED

The command tried to load a common block that is already occupied.

VMR -- COMMON BLOCK PARAMETER MISMATCH <common-name>

Parameters of a common block do not match those in the task's label block.

VMR COMMANDS

VMR -- COMMON BLOCK SEGMENT COUNT ERROR

The command tried to install a resident library with overlays, but the number of overlay segments specified in the task header is different from the number specified in the segment descriptors.

VMR -- DEVICE ddn: IS ATTACHED

One or more device-units handled by the driver are attached. Therefore, the driver cannot be unloaded.

VMR -- DEVICE ddn: NOT IN SYSTEM

The specified device in the command was not defined in the system image; or the data base for a device driver to be loaded was neither in the system image nor in the driver's task image.

VMR -- DEVICE NOT MOUNTED

The device containing the system image file was not mounted.

VMR -- DEVICE NOT REDIRECTABLE

The specified device cannot be redirected.

VMR -- DEVICE NOT TERMINAL

The command tried to set terminal characteristics for a device that is not a terminal.

VMR -- DEVICE NOT VARIABLE SPEED MULTIPLEXER

The command tried to set the baud rate for a terminal that was not attached to a DH11 or DZ11 multiplexer.

VMR -- DRIVER ALREADY RESIDENT

The specified device driver is already loaded or is permanently resident in the system image.

VMR -- DRIVER BUILT WITH WRONG STB FILE

The STB file for the driver is not compatible with the Executive STB file for the current system image.

VMR -- DRIVER CANNOT BE UNLOADED

The UNLOAD command attempted to remove a permanently resident device driver (that is, a driver linked to the Executive).

VMR COMMANDS

VMR -- DRIVER NOT LOADED

The specified device driver in the UNLOAD command was not resident in memory.

VMR -- DRIVER REQUIRES RUNNING SYSTEM FOR LOAD/UNLOAD

The requested driver included the symbols \$ddLOA or \$ddUNL in its source. Support of driver load/unload calls can only be provided by MCR LOAD/UNLOAD. Note however, that these symbols are reserved for future use by the MCR LOAD and UNLOAD commands.

VMR -- EXECUTIVE IS TOO LARGE

The system image indicates that the Executive is larger than 16K words, but 20K Executive support was not included during SYSGEN or, if 20K Executive support was included, the Executive is larger than 20K. The system is unusable.

VMR -- FILE filename HAS ILLEGAL FORMAT

The specified symbol table file has an invalid format for an RSX-11M/RSX-11S symbol table file.

VMR -- FILE filename HAS INCONSISTENT DATA

The driver has an invalid loadable data base. When loading a common library, the partition extended beyond the size of the task image file and thus could not be loaded. See the RSX-11M Guide to Writing a Device Driver.

VMR -- FILE name NOT A VALID DRIVER TASK IMAGE

The driver's task image was either overlaid, had a task header, or referenced a resident library.

VMR -- FILE NOT CONTIGUOUS

The command tried to install a task or load a driver from a non-contiguous file. Task and loadable driver images must be contiguous files.

VMR -- FILE NOT FOUND

The requested file is not in the directory on the specified volume.

VMR -- FILE NOT TASK IMAGE

Data in the label block is not correct, indicating that the file is not a valid task image.

VMR -- ILLEGAL DEVICE/VOLUME

The specified device is not a valid task residence device.

VMR COMMANDS

VMR -- ILLEGAL DRIVER TASK APR USAGE

A device driver must be built for APR 5 and must be less than 4K (e.g. PAR=DRVPAR:120000:20000). This message applies to mapped systems only.

VMR -- ILLEGAL ERROR-SEVERITY CODE code

This message indicates an internal failure in VMR. If this error message persists, contact a Digital software representative.

VMR -- ILLEGAL FILE SPECIFICATION

filespec

The indicated file specification has an illegal format or contains wild cards.

VMR -- ILLEGAL FIRST APR

A task was built using a base APR other than zero for non-privileged tasks or APR 4 or APR 5 for privileged tasks. If the Executive was built to support 20K of address space, APR 5 is the only valid base APR for tasks mapping into the Executive. A privileged task that does not map into the Executive must use APR 0 as its base. (See the RSX-11M Task Builder Reference Manual for a description of the /PR keyword.) This message applies only to mapped system images.

VMR -- ILLEGAL FUNCTION

A command was entered that VMR does not recognize.

VMR -- ILLEGAL GET COMMAND LINE ERROR CODE

This error indicates a system failure. If this message persists, contact a Digital software representative.

VMR -- ILLEGAL KEYWORD VALUE

A value entered for a keyword exceeds its limits.

VMR -- ILLEGAL OPERATION FOR SAVED SYSTEM

The LUN and REASSIGN commands cannot be issued for a saved system image.

VMR -- ILLEGAL PRIORITY

The value of the priority in the command is out of range (that is, not 1 to 250(10), inclusive).

VMR COMMANDS

VMR -- ILLEGAL SWITCH

/switch

The indicated switch, in the context of the command line entered, is incorrect.

VMR -- ILLEGAL VALUE FOR SYMBOL symname IN FILE name

The symbol symname has been defined to an illegal value by the file name. This occurs for several reasons, some general and some specific to the individual symbols. For example, most symbols cannot be defined to zero and mapped loadable drivers cannot reference \$INTSV.

VMR -- INDIRECT COMMAND SYNTAX ERROR

command line

The indicated command line was entered with an improper indirect file specifier.

VMR -- INDIRECT FILE DEPTH EXCEEDED

command line

The indicated command line was an attempt to exceed more than two levels of indirect files.

VMR -- INDIRECT FILE OPEN FAILURE

command line

The indirect command file in the indicated command line could not be opened.

VMR -- INTERRUPT VECTOR ALREADY IN USE

A driver interrupt vector does not point to one of the nonsense interrupt entries in the system image.

VMR -- INVALID DRIVER DATA BASE AT OFFSET xxxx IN FILE name

The driver had an invalid data base value at offset xxxx relative to the symbol \$ddDAT. (See the RSX-11M Guide to Writing an I/O Driver.)

VMR -- INVALID INTERRUPT VECTOR

The interrupt vector address specified in the driver data base was too high for the current system image.

VMR -- INVALID KEYWORD

A keyword has been encountered that is incorrect in the context of the specified command.

VMR COMMANDS

VMR -- INVALID RECORD ADDRESS FOR FILE name

An attempt was made to write outside of the system image file or to write beginning at a byte boundary. The most frequent cause of this, is a corrupted system image or an STB file that does not match the system image.

VMR -- INVALID SPEED

The specified multiplexer line does not support the requested speed; or the command specified unequal receive and transmit speeds for a DZ11. The DZ11 does not support split speeds.

VMR -- INVALID TIME PARAMETER

A time field is incorrect.

VMR -- INVALID UIC

A value of zero for either the group number or the member number was detected.

VMR -- I/O ERROR ON INPUT FILE filename

An input I/O error occurred on the indicated file.

VMR -- I/O ERROR ON OUTPUT DEVICE

An output I/O error was encountered while saving the system.

VMR -- I/O ERROR ON OUTPUT FILE filename

An output I/O error occurred on the indicated file.

VMR -- LENGTH MISMATCH COMMON BLOCK <common-name>

The length parameter for the common block, as described in the label block for the task image, is different from the corresponding length parameter defined in the system image. A task's label block data must match system data for that task before it can be installed.

VMR -- LINE NOT DZ11

The command attempted to declare a line remote that was not attached to a DZ11 multiplexer.

VMR -- LOADABLE DRIVER SUPPORT NOT IN SYSTEM

The system generation option to support loadable device drivers was not chosen for the system image.

VMR COMMANDS

VMR -- LOGICAL DEVICE NOT IN SYSTEM

The specified logical device is not defined in the logical device tables.

VMR -- LUN OUT OF RANGE

The command tried to re-assign a LUN which is greater than the maximum number of LUNs allocated during task build.

VMR -- NO CHECKPOINT SPACE, ASSUMING NOT CHECKPOINTABLE

This is a warning message. The command attempted to install the task as checkpointable; but the task was not built with checkpoint space allocated in its task image file. Because the system does not support the dynamic allocation of checkpoint space, it considers the task not to be checkpointable.

VMR -- NO LUNS

The task specified as the argument of the LUN command does not have any logical units assigned. This is not an error message; rather, it is an indication that there are no assignments to display.

VMR -- NO POOL SPACE

A request for dynamic memory in the system image by VMR cannot be satisfied.

VMR -- NO ROOM AVAILABLE IN STD FOR NEW TASK

There is no dynamic storage available to make an entry in the system task directory (STD); therefore, the task cannot be installed.

VMR -- NON EXISTENT MEMORY

The command tried to define a partition in nonexistent memory.

VMR -- NOT ENOUGH APRS FOR TASK IMAGE

The Task Builder allows you to specify the virtual base address of a task image as a multiple of 4K. Privileged tasks start at a virtual 100000(8) to map the first 16K of the Executive, or virtual 120000(8) to map the first 20K of the Executive, at the same time as the user task. If the virtual base address is set too high, the task image may not be able to be mapped with the remaining mapping registers. This message is applicable to mapped system images only.

VMR -- OLD DEVICE ATTACHED

The command tried to redirect an attached device-unit.

VMR COMMANDS

VMR -- OPEN FAILURE ON FILE filename

The indicated file could not be opened.

VMR -- PARTITION ALREADY EXISTS

The command tried to define a partition with a name that is already in use.

VMR -- PARTITION BUSY

The partition in which the task was to be fixed or driver loaded was occupied. An attempt was made to fix a task in a system-controlled partition. An attempt was made to unload a partition with installed tasks or loaded drivers.

VMR -- PARTITION parname IS A COMMON

The command tried to load a device driver into a common partition. A device driver cannot be loaded into a common partition.

VMR -- PARTITION NOT COMMON

A partition specified for a common area or library is not defined as a common partition.

VMR -- PARTITION NOT IN SYSTEM

The partition name specified as an argument in a command cannot be found in the system image.

VMR -- PARTITON par NOT IN SYSTEM, DEFAULTING TO GEN

This is a warning message. The specified partition does not exist; VMR therefore attempts to install the task in the GEN partition.

VMR -- POOL LINK ERROR AT xxxx BLOCK=yyyy zzzz

When SET /POOL traced the pool linkage, an error was detected at location xxxx in the system image. The contents of xxxx is yyyy and the contents of xxxx+2 is zzzz.

VMR -- PRIVILEGED TASK LARGER THAN 12K

A privileged task was larger than 12K. Privileged tasks on an unmapped system have a maximum size of 12K.

VMR -- PSEUDO DEVICE ASSIGNMENT ERROR

A logical device name may not be assigned to a pseudo device.

VMR COMMANDS

VMR -- PSEUDO DEVICE REDIRECT ERROR

The command tried to redirect a pseudo device to another pseudo device.

VMR -- RECEIVE DATA OR BY REFERENCE LIST NOT EMPTY

A task with entries in its receive queues cannot be removed from the system image.

VMR -- SPACE USED

The command tried to create a partition or a subpartition in a main storage area already occupied.

VMR -- SPECIFIED PARTITION FOR COMMON BLOCK

The command tried to install a task in a common block.

VMR -- SPECIFIED PARTITION TOO SMALL

The task being installed is larger than the partition into which it is being installed.

VMR -- SYMBOL symname IS DOUBLY DEFINED BY FILE name

The symbol symname is defined twice by the file name. Duplicate symbols are illegal.

VMR -- SYMBOL symname IS UNDEFINED IN FILE name

The symbol symname was found in the file name, but it was not a symbol definition.

VMR -- SYNTAX ERROR

This message generally indicates that the required information has been entered incorrectly. You can usually correct this condition by retyping the arguments according to the command specifications.

VMR -- TASK ACTIVE

The task used as the argument of the command is active.

VMR -- TASK ALREADY FIXED

The task used as the argument of the FIX command is already fixed in the system image.

VMR -- TASK AND PARTITION BASES MISMATCH

The base of the partition does not match that of the task being installed. Applicable only to unmapped system images.

VMR COMMANDS

VMR -- TASK IMAGE I/O ERROR

VMR could not read the task-image file, or the INSTALL command could not rewrite the task-image header. (The device is write-locked.)

VMR -- TASK IMAGE CURRENTLY INSTALLED

The requested task image, which was checkpointable, had already been installed. On systems that do not support the dynamic allocation of checkpoint space, checkpointable tasks that have checkpoint space allocated can be installed only once; other tasks can be installed more than once.

VMR -- TASK IMAGE VIRTUAL ADDRESS OVERLAPS COMMON BLOCK <block-name>

The virtual addresses reserved for the task image overlap those reserved for the common block specified. A corruption of the task image file probably caused the overlap.

VMR -- TASK IS CHECKPOINTABLE

A checkpointable task cannot be fixed in the system image.

VMR -- TASK NAME ALREADY IN USE

The command tried to install a task having the same name as one already in the system image.

VMR -- TASK NOT FIXED

The command tried to unfix a task that is not fixed.

VMR -- TASK NOT IN SYSTEM

The referenced task has not been installed.

VMR -- TI REDIRECT ERROR

The pseudo device TI: may not be redirected.

VMR -- TOO MANY COMMON BLOCK REQUESTS

A task is limited to seven common blocks.

VMR -- TOO MANY LUNS

A task has requested more than 255(10) LUNs to be assigned.

VMR -- TOO MANY SUBPARTITIONS

The command tried to define more than seven subpartitions. A main partition is limited to a maximum of seven partitions.

VMR COMMANDS

VMR -- UNDEFINED COMMON BLOCK <common-name>

A task references a common block that is not defined in the system image. Usually, this indicates that the task was built to run in another system.

VMR -- UNKNOWN MAIN PARTITION

The command tried to define a subpartition of a nonexistent main partition.

VMR -- WARNING - PRIVILEGED TASK OVERMAPS I/O PAGE

This message warns that a privileged task that may require access to the I/O page does not have the access. A privileged task that is mapped into the Executive is usually also mapped into the I/O page in order to access the KTL1 registers and other devices. Many privileged tasks do not require this access and can use the additional 4K words of virtual address space for the task image.

VMR -- WRITE CHECK NOT SUPPORTED FOR DEVICE

The command tried to enable write check on a device that does not support it. Write check is currently supported for all disks except DL: and DX:.



CHAPTER 6

MOVING A VERSION 3.1 SYSTEM TO A VERSION 3 DISK

When an existing RSX-11M V03 system with a hardware configuration of one RP02/03/04 drive plus magtape, is to be converted to a V03.1 system, there are basically two procedures available. They are described below. (A is the pack with the existing V03 system, B is an initially blank pack.)

Procedure 1 -- Put A in the drive and boot the V03 system. Transfer all user files from A to magtape. Put B in the drive and do a V03.1 SYSGEN. Transfer all user files from magtape to B.

Procedure 2 -- Put B in the drive and do a V03.1 SYSGEN. Transfer all files required to install and run a V03.1 system to magtape. Put A in the drive and boot the V03 system. Transfer V03.1 system files from magtape to A. Install and boot the V03.1 system on A.

In both procedures, magtape transfers are done by FLX.

The decision of which procedure to use depends primarily on the total volume of user files. If the volume is large, procedure 1 could require a large number of magtapes and many hours of work for the operator.

Another problem is that FLX truncates file names that are longer than 6 characters, and does not preserve the version number field of the file name.

Therefore, procedure 2 is more attractive when there is a large number of user files. There are two command files on the RP02/03/04 distribution kit that do most of the work. They are stored under UFD [200,200] with the names COPS1.CMD and COPS2.CMD.

COPS1 and COPS2 both assume that the V03.1 target system is the same type as the V03 system that exists already, where "type" refers to mapped or unmapped. The RP02/03 and RP04/05/06 distribution kits contain both mapped and unmapped systems. Therefore, when starting COPS1, make sure you are running a system of the same type as your V03 system.

In the descriptions of COPS1 and COPS2, there are command lines and comments containing a UIC or UFD of the following type:

[1,2x]

where the character x will be replaced by 0 if the current system is unmapped, and by 4 if the current system is mapped.

MOVING A VERSION 3.1 SYSTEM TO A VERSION 3 DISK

The following are instructions on the procedure, and details of the COPSyl and COPS2 command files.

First, transfer the V03.1 distribution kit from magtape to a blank pack and perform a SYSGEN, as described in Chapter 3. Near the end of SYSGEN part 2, when VMR is invoked, the example tells you to invoke the command file INSTALL.CMD to install tasks in the target system. If you intend to use COPSyl and COPS2, do not invoke INSTALL.CMD. Also, do not boot the target system. Instead, when SYSGEN part 2 has finished, issue the following command:

```
>@[200,200]COPSyl
```

6.1 COPYING VERSION 3.1 TO MAGTAPE

```
; COPSyl <VERSION 02>
;
; COPYRIGHT (C) 1976,1977
; DIGITAL EQUIPMENT CORP., MAYNARD MASS. 01754
;
; THIS COMMAND FILE TRANSFERS ALL FILES NECESSARY TO RUN AN
; RSX-11M V03.1 SYSTEM FROM THE CURRENT V03.1 SYSTEM DISK TO A
; MAGTAPE. ADDITIONALLY, THE COMMAND FILE COPS2.CMD IS
; TRANSFERRED. COPS2 WILL COPY THE FILES FROM THE MAGTAPE
; TO THE V03 SYSTEM DISK AND INSTALL A V03.1 SYSTEM ON THAT DISK.
;
INS [1,5x]FLX
* WHAT DEVICE IS THE MAGTAPE MOUNTED ON [DDU] [S]:
```

The following commands assume your magtape drive is a TS03 or TU10, in which case you answer MT to the question above. Otherwise, all occurrences of MT in the following commands are replaced by MM.

```
LOA MT:
;
; MOUNT A BLANK MAGTAPE IN MT0:
;
* IS MT0: READY? [Y/N]:
```

When the tape is ready, files from UFD [1,1] and [1,2] are copied to tape as well as the command file INSTALL.CMD, which was created by SYSGEN Part 2 and the Executive assembly prefix file RSXMC.MAC.

```
SET /UIC=[200,200]
FLX MT:/ZE
FLX MT:/DO=COPS2.CMD/RS,INSTALL.CMD,RSXMC.MAC
SET /UIC=[1,1]
FLX MT:/DO=SYSLIB.OLB/RS,EXELIB.OLB,RSXMAC.SML,EXEMC.MLB
FLX MT:/DO=ODT.OBJ/RS,TRACE.OBJ
SET /UIC=[1,2]
FLX MT:/DO=QIOSYM.MSG/RS,SYE.HLP,STARTUP.CMD

SET /UIC=[1,2X]

FLX MT:/DO=RSXBLD.CMD/RS,RSX11M.OLB
SET /UIC=[1,5x]
FLX MT:/DO=*.TSK/RS,*.SYS,*.STB
REM FLX
UNL MT:
```


MOVING A VERSION 3.1 SYSTEM TO A VERSION 3 DISK

DEA MT:

```
;
; NOW DISMOUNT AND REMOVE THE CURRENT SYSTEM DISK FROM THE TAPE DRIVE.
; MAKE A BACKUP OF THE V03 SYSTEM DISK, IF YOU DON'T HAVE ONE
; ALREADY. THEN PUT THE V03 SYSTEM DISK IN A DRIVE AND BOOT
; IN THE SYSTEM. USE FLX TO TRANSFER COPSY2.COMD FROM THE TAPE
; TO THE SYSTEM DISK AND THEN INVOKE IT AS AN INDIRECT COMMAND FILE.
```

```
;
; EXAMPLE:
```

```
;
; >DMO SY:
;
; (BOOT THE V03 SYSTEM)
;
; >SET /UIC=[200,200]
; >RUN $FLX
; FLX>=MT0:COPSY2.COMD
; FLX>^Z
; >@COPSY2
;
; COPSY2 CONTAINS FURTHER INSTRUCTIONS.
;
```

End of COPSY1.

6.2 COPYING VERSION 3.1 TO A VERSION 3 DISK

```
; COPSY2 <VERSION 02>
;
; COPYRIGHT (C) 1976,1977
; DIGITAL EQUIPMENT CORP., MAYNARD MASS. 01754
;
; YOU SHOULD MAKE A BACKUP COPY OF THE V03 RSX11M SYSTEM DISK
; BEFORE YOU PROCEED ANY FURTHER.
;
; * DO YOU WANT TO PROCEED? [Y/N]:
```

If the question above is answered with an N, the command file processing terminates. When ready, restart COPSY2. Otherwise, processing continues here.

```
;
; THIS COMMAND FILE WILL USE TWO UFD'S FOR SPECIAL PURPOSES:
; - [2,5x] FOR STORAGE OF THE EXISTING V03 SYSTEM
; - [377,377] AS A SCRATCH UFD
; IF EITHER UFD IS ALREADY IN USE, YOU MUST EDIT
; THIS COMMAND FILE AND CHANGE ALL OCCURENCES OF THE RESPECTIVE
; UFD TO WHATEVER YOU PREFER.
;
; * DO YOU WANT TO CHANGE UFD'S? [Y/N]:
```

If the answer is Y, the following example is displayed, and the processing terminates. When ready, restart COPSY2.

```
;
; THE FOLLOWING SHOWS HOW TO CHANGE THE SCRATCH UFD ([377,377])
; TO [377,300], AND THE STORAGE UFD TO [3,44].
;
; >SET /UIC=[200,200]
; >RUN $EDI
; EDI>COPSY2.COMD
```

MOVING A VERSION 3.1 SYSTEM TO A VERSION 3 DISK

```
; *BL OFF
; *TOP
; *PAS/377,377/377,300/
; *TOP
; *L [2,5X]
; *C/2,5SS/3,44/
; ED
;
; WHEN THE EDIT IS COMPLETE, RESTART COPS2.
```

If no edits have to be done, processing continues here.

```
; THIS COMMAND FILE TRANSFERS THE FILES FROM THE MAGTAPE CREATED
; BY COPS1 TO AN RSX-11M V03 SYSTEM DISK.
; THE FILES ARE MADE CONTIGUOUS WHERE REQUIRED.
;
```

* IS YOUR MAGTAPE DRIVE A TU16 OR TU45? [Y/N]:

```
INS [1,5x]FLX
INS [1,5x]PIP
INS [1,5x]UFD
```

If any of the INS commands above failed, for example because your system has partitions with nonstandard names, you will be asked to install the task(s) manually.

* DID ANY OF THE PREVIOUS INSTALLS FAIL? [Y/N]:

If the answer to this question is Y, the following is displayed.

```
;
; WE WILL PAUSE TO ALLOW YOU TO INSTALL ANY TASKS WHICH
; FOR SOME REASON MAY NOT HAVE BEEN INSTALLED SUCCESSFULLY.
;
AT. -- PAUSING. TO RESUME TYPE "RES ...AT."
;
; WE NOW CREATE THE TEMPORARY VERSION 3 SYSTEM UFD
; AND THE SCRATCH UFD.
;
UFD SY:[2,5x]
UFD SY:[377,377]
REM UFD
;
; RENAME ALL FILES UNDER THE CURRENT SYSTEM UFD TO THE
; TEMPORARY VERSION 3 SYSTEM UFD.
;
SET /UIC=[1,1]
PIP [2,5x]/RE=[1,5x]*.*;*
;
; WE NOW TRANSFER FILES FROM MAGTAPE.
;
SET /UIC=[200,200]
FLX =MT:INSTAL.COM,RSXMC.MAC
PIP INSTALL.COM/NV/RE=INSTAL.COM
SET /UIC=[1,1]
FLX =MT:SYSLIB.OLB,EXELIB.OLB
PIP SYSLIB.V03.1/CO=SYSLIB.OLB
PIP SYSLIB.OLB;0/DE
PIP EXELIBV03.1/CO=EXELIB.OLB
PIP EXELIB.OLB;0/DE
FLX =MT:RSXMAC.SML,EXEMC.MLB,ODT.OBJ,TRACE.OBJ
SET /UIC=[1,2]
```

MOVING A VERSION 3.1 SYSTEM TO A VERSION 3 DISK

```

FLX =MT:QIOSYM.MSG,SYE.HLP,STARTUP.CMD
SET /UIC=[1,2X]
FLX=MT:RSXBLD.CMD,RSX11M.OLB

SET /UIC=[377,377]
FLX =MT:[1,5x]*.*
REM FLX
SET /UIC=[1,5X]
PIP /CO=[377,377]*.TSK,*.SYS
PIP [377,377]*.TSK;*/DE,*.SYS;*
PIP=[377,377]
PIP [377,377]*.*;*/DE
SET /UIC=[1,1]
PIP SYSLIB.OLB/RE/NV=SYSLIV03.1
PIP EXELIB.OLB/RE/NV=SYSLIBV03.1
PIP EXELIB.OBL/RE/NV=EXELIBV03.1
REM PIP
SET /UIC=[1,5X]
;
;WE NOW INVOKE VMR TO INSTALL THE TASKS IN THE
; V03.1 SYSTEM USING THE COMMAND FILE [200,200] INSTALL.CMD.
;
;     NOTE - IT IS ASSUMED THAT YOU HAVE NOT INSTALLED ANY
;     TASKS WITH VMR DURING SYSGEN PART 2! IF YOU HAVE, YOU
;     SHOULD OBTAIN A TASK LISK ( VMR>TAS ) AND REMOVE THE
;     TASKS WITH VMX BEFORE CALLING INSTALL.CMD.
;
; EXAMPLE:
;
;     >VMR
;     ENTER FILE NAME: RSX11M
;     VMR>TAS
;     . LDR.      LDR      248. 000000 SY0:00000000 FIXED
;     TKTN   03   SYSPAR 248. 010000 SY0:00103137
;     ...MCR 02   SYSPAR 160. 010000 SY0:00101476
;     :
;     :
;     VMR>REM TKTN
;     VMR>REM ...MCR
;     :
;     :
;     VMR>@[200,200]INSTALL
;     VMR>^Z
;
REM VMR
INS VMR
ASN SY:=LB:
VMR
REM VMR

```

When the VMR session is finished, processing continues here.

```

;
; THE VERSION 3.1 SYSTEM IS NOW READY TO BOOT WITH THE
; FOLLOWING COMMAND.
;
;     >BOO RSX11M
;
; WHEN THE NEW SYSTEM IS UP AND RUNNING, DELETE THIS COMMAND
; FILE, WHICH IS NO LONGER NEEDED, WITH THE FOLLOWING COMMANDS:
;
;     >SET /UIC=[200,200]
;     >PIP COPSY2.CMD;*/DE
;

```

MOVING A VERSION 3.1 SYSTEM TO A VERSION 3 DISK

```
; ALSO, DELETE THE SCRATCH UFD WITH THE FOLLOWING COMMAND
; (ASSUMING THE UFD IS "[377,377]"):
;
;     >PIP [0,0]377377.DIR;*/DE
;
; YOU MAY THEN DELETE ALL VERSION 3 SYSTEM FILES FROM THE
; DISK. EXAMPLE:
;
;     >SET /UIC=[1,1]
;     >PIP *.* /PU,[1,2]*.*
;     >PIP [1,2x]RSXBLD.CMD/PU,RSX11M.OLB
;     >PIP [200,200]RSXMC.MAC/PU
;     >PIP [2,5x]*.*;*/DE
;     >PIP [0,0]00205x.DIR;*/DE
;
; THE DISK PACK NOW CONTAINS ALL FILES NEEDED TO RUN THE
; VERSION 3.1 SYSTEM. IF YOU WANT OTHER FILES FROM THE VERSION 3.1
; DISTRIBUTION KIT TRANSFERRED TO THIS DISK, (E.G. CMD, ODL
; AND OLB FILES TO REBUILD ANY UTILITIES), YOU MUST COPY
; THEM MANUALLY VIA MAGTAPE WITH FLX.
```

End of COPS2.

APPENDIX A
SYSTEM CONVENTIONS

A.1 RSX-11M UIC CONVENTIONS

The RSX-11M Release 3.1 distribution kits observe a set of UIC conventions for files on disk. The purpose of these conventions is to provide a uniform and consistent means of allocating, locating, and maintaining files on disk.

On a disk, there are many User File Directories (UFDs) in which files are catalogued. A particular UFD is referenced by specifying the correct UIC. The UIC consists of two numbers separated by a comma and enclosed in brackets (such as UIC [11,20]). The first number (11) is the group number; the second number (20) is the member number, which indicates a specific directory within a group of directories. RSX-11M makes use of the UICs to keep related files in specific directories.

A.1.1 Group Number

The group number is used to identify groups of directories. By convention, group numbers of 1 through 10 are reserved for access by the Executive. At present, only group number 1 is used. It is used to identify UFDs which contain files relevant to an RSX-11M system. Group numbers 11-377(8) may be used for user files. Please note, however, that group numbers 11-27(8) are reserved by Digital for storing files relevant to the Executive and Ancillary Control Processors (ACP).

Group Number	11	is used for Executive files
	12	is used for MCR files
	13	is used for FCP files

In addition, group numbers 30-177(8) are reserved for DEC-supplied software tasks. The distribution kit only uses group numbers 1, 11, 12, 13, 15, 35, 45, and 200.

Group number	15	is used for privileged utility tasks (PMD, RMDEMO, etc.)
Group number	35	is used for DMP files
Group number	45	is used for K-series files
Group number	200	is used for SYSGEN indirect command files

A.1.2 Member Number

The second number (member number) is used to hold different file types of the group. For example, the UIC [11,10] contains source modules of the Executive. Member numbers currently in use are:

SYSTEM CONVENTIONS

- 10 - Source modules.
- 20 - Object modules, assembly and task build command files, object module libraries, overlay descriptor files for the Executive and all unmapped privileged and nonprivileged tasks.
- 24 - Same as 20 above, except that files are for mapped privileged and nonprivileged tasks, and the Executive.
- 30 - Listing and map files for all unmapped privileged and nonprivileged tasks.
- 34 - Listing and map files for all mapped privileged and nonprivileged tasks.
- 40 - SLP correction files for files located under member number 10.
- 50 - Tasks and Executive for RSX-11M unmapped system.
- 54 - Tasks and Executive for RSX-11M mapped system.
- 60 - Tasks and Executive for RSX-11S unmapped system.
- 64 - Tasks and Executive for RSX-11S mapped system.
- 200 - SYSGEN indirect command files.

Member numbers 50, 54, 60, and 64 exist only for group number 1. Member numbers 10 and 40 exist only for group numbers above 10. Member numbers 20, 24, 30, and 34 exist for all group numbers. Member number 200 is used exclusively with group number 200.

For example, for MCR:

- [12,10] Source files.
- [12,20] Unmapped object modules, assembly command files and library build command file.
- [12,24] Mapped object modules, assembly command files and library build command file.
- [12,30] Unmapped listing files.
- [12,34] Mapped listing files.
- [12,40] SLP correction files for files under [12,10].

For the unmapped system:

- [1,20] Object module libraries, task build command files, and Task Builder overlay description files for all tasks.
- [1,30] Area for task maps.
- [1,50] RSX-11M Executive and system tasks.

For the mapped system:

- [1,20] Object module libraries, all task build overlay descriptor files for all nonprivileged tasks.

SYSTEM CONVENTIONS

- [1,24] Object module libraries, task build command files for all mapped tasks, and overlay description files for all privileged tasks.
- [1,34] Executive and task maps.
- [1,54] RSX-11M Executive and system tasks.

Other UICs:

- [1,1] System and macro object module libraries.
- [1,2] System message files.
- [1,3] Directory for lost files found by VFY.
- [1,4] Directory for Post-Mortem and Snapshot Dumps.
- [1,6] Directory for error log files.

A.2 NAMING CONVENTIONS

System file names have the following general format:

pppnnnsss.typ

where:

ppp is an optional prefix used to designate a special version or characteristic of the named file. The designation BIG, for example, is sometimes used to designate a task, such as TKB, that is built to operate in more than 8K of memory, e.g., BIGTKB.

nnn is the system identification for the task. Table A-1 lists all system tasks, together with the identification and group codes.

sss is a suffix for noting the relationship of the file to the task specified in the nnn identification. For example, PIPBLD.CMD is the command file for building PIP.

Suffixes:

ASM - Assembly command file
BLD - Task Builder command or overlay description file

typ is the standard mnemonic for file type, such as MAP, CMD, etc.

Types:

CMD - Command File
LST - MACRO-11 Listing File
MAC - MACRO-11 Source File
MAP - Task Map File
MLB - User Macro Library File
OBJ - MACRO-11 Object Library File
ODL - Overlay Description File
OLB - Object Library File
PMD - Post-Mortem or Snapshot Dump File
SML - System Macro Library File
STB - Task Symbol Table File
TSK - Task/Driver Image File

SYSTEM CONVENTIONS

Table A-1
System Identification Codes

SYSTEM ID	GROUP CODE	DESCRIPTION
RSX	11	RSX-11M/S Executive, drivers, and tables
MCR	12	Monitor Console Routines
FCP	13	Files-11 Ancillary Control Processor (ACP)
PMD	15	Post-Mortem and Snap-Dump Processor
BMR	16	Basic MCR (RSX-11S)
ERL	17	Error Logger
OTL	20	On-Line Task Loader (RSX-11S)
SIP	21	System Image Preservation Program (RSX-11S)
MTA	22	Magtape ACP
MAC	30	MACRO-11 Assembler
TKB	31	Task Builder
PIP	32	Peripheral Interchange Program
FLX	33	File Transfer Program
VFY	34	File Structure Verification Program
DMP	35	File Dump Utility
DSC	36	Disk Save and Compress Utility (task version)
EDI	37	Line Text Editor
SLP	40	Source Language Input Program
PRESRV	41	Volume Preservation Program
LBR	42	Librarian
PRT	46	Print Spooler
ODT,TRACE	47	Online debugging tool, trace
FCS	50	File Control Services
FOROTS	51	FORTTRAN-IV Object Time System
PSE,SYE	54	Error log formatters
ZAP	57	File Patch Utility Program

(Continued on next page)

SYSTEM CONVENTIONS

Table A-1 (Cont.)
System Identification Codes

SYSTEM ID	GROUP CODE	DESCRIPTION
BAD	62	Bad Block Locator Program
DSCSYS	63	Disk Save and Compress Utility (stand-alone version)
CRF	65	Cross Reference Utility Program
VMR	70	Virtual MCR Program
UMD	101	User Mode Diagnostics
FTB	106	Fast Task Builder
CMP	107	File Compare Utilitiy
PAT	111	Object Module Patch Utility



APPENDIX B
OPERATING HINTS

B.1 BOOTSTRAPPING A WRITE-LOCKED DISK

It is possible to bootstrap RSX-11M from a write-locked disk. In the Baseline System, this usually manifests itself in the lack of response from the MOUNT command in the load sequence of the system and in the display of checkpoint write errors for the SAVE command. Thus, for a system bootstrapped from DK0:, the console output might be displayed as:

```
RSX-11M V03.1 BL22 24K
>RED LB:=DK0:
>RED SY:=DK0:
>MOU DK0:UNMOBJ
*** ...SAV SY0: -- CHECKPOINT WRITE ERROR
*** ...MCR SY0: -- CHECKPOINT WRITE ERROR
```

The problem occurs because SAVE and MOUNT run in the same partition. SAVE is checkpointable and waits for MOUNT to complete before continuing. Because SAVE could not be checkpointed due to the disk being write-locked, MOUNT could not get in. There are two solutions to the problem:

1. Write-enable the disk and reboot.
2. Write-enable the disk and abort SAVE. This will allow MOUNT to come in and run. When MOUNT has completed, the system will prompt normally. The user will then have to issue the @[1,2] STARTUP command manually.

B.2 RUNNING OUT OF DYNAMIC MEMORY

It is possible to exhaust dynamic memory during the running of RSX-11M. This can occur if a large number of tasks are installed, if many volumes are mounted, or if a number of other conditions are present. (The following section describes all dynamic memory uses.) This problem can manifest itself in the lack of any response from the system. Although the system looks like it is operating successfully, it cannot accept any MCR commands or complete the execution of presently running tasks because they all require dynamic memory. Another manifestation of the problem may be I/O errors being received by tasks or failures in the Loader due to pool allocation failures. The only solution to this problem is to bootstrap the system and make more dynamic space available (SET /POOL), remove tasks, mount fewer volumes, rebuild FCP with space for more file control blocks in its partition, or rebuild the system with more dynamic memory.

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B.3 DYNAMIC MEMORY REQUIREMENTS

During the course of its execution, the RSX-11M Executive has varying needs for dynamic memory. At any one time, many I/O requests can be active, several files can be open, or multiple time-dependent scheduling requests can be queued. Rather than allocate a fixed amount of memory for each requirement, the RSX-11M Executive makes use of a dynamically allocated memory space called the dynamic storage region. As demands for space are made, the necessary memory is allocated from this region using a first-fit algorithm. When allocated space is no longer needed, it is released back to the pool of available memory. The initial size of the dynamic storage region is established during the execution of the System Generation query files. This initial allocation can be extended later via the MCR SET /POOL command when the generated system is bootstrapped.

Dynamic memory requirements for a system are dependent on the configuration, application, and degree of system loading. Enough memory must be available to satisfy peak demands; otherwise, a degradation in system performance will occur. On the other hand, if too much memory is made available, it is never used and is thus wasteful of system resources.

Summarized below are the sources that make demands on the dynamic storage region. In general, a system should contain a dynamic storage region equal to the size of the aggregate sum of the peak demands made simultaneously among the various categories. Having calculated this figure, it is also advisable to add an increase of approximately ten percent to cover possible fragmentation contingencies. The maximum size of the dynamic storage region is limited by physical memory in an unmapped system. In a mapped system, the total size of the Executive, resident drivers, and the dynamic storage region, must be less than 16K or 20K words (depending on the way the system was generated).

B.3.1 Sources Requiring Dynamic Memory

The following list identifies those system elements requiring dynamic memory:

1. Each task installed in the system requires at least 20 words for a task control block.
2. Each I/O request results in the allocation of an 18-word I/O packet, which is queued to the appropriate device driver.
3. Each Send Data or Send by Reference message sent to a task results in an 18-word message packet being allocated to hold the requisite data.
4. Each main partition and subpartition requires a partition control block of at least 14 words to describe its memory. In addition, for each active task, fixed task, and loaded driver in a system-controlled partition (whether the tasks are checkpointed or in memory) a PCB is built and allocated in the dynamic storage region.
5. Each open file requires 18 words for a file control block and 18 words for a window block which contains virtual-to-logical block mapping pointers. (See space saving hint 3 below.)

OPERATING HINTS

6. Each mounted volume requires 18 words for a volume control block, 18 words for the index file window block, and 18 words for the index file control block. In addition, three 18-word control blocks are required to hold information pertaining to the last three directory files that were accessed. For systems that include I/O optimization, MOU will try to allocate a window block for the index file of sufficient size to contain all the retrieval pointers. This could require up to 208 words. If the space is not available, MOU will default to 18 words. (See space saving hint 4 below.)
7. Each clock queue entry requires eight words. These entries represent mark time, schedule, and periodic rescheduling requests.
8. Each powerfail, receive, and FPP AST trap-enable for active tasks requires eight words for an AST control block.
9. All terminal input is buffered in the terminal driver before transferring information to the user buffer. Each solicited and unsolicited input request requires a 42-word input buffer.
10. Card images read from the CM/CR11 are buffered by the card reader driver before transferring the translated information to the user buffer. Binary input requires an 80-word buffer, whereas ASCII input requires a 40-word buffer.
11. Each LPS11/AR11 synchronous function requires 20 words for a sample control block.
12. In a mapped system, the task header is copied into a block of memory allocated from the dynamic storage region. Approximately 64 words (dependent upon the number of LUNs and window blocks) are required for each task that is in memory (i.e., in execution and not checkpointed, or inactive and fixed).
13. Each task linked to ICS/ICR-11 interrupts requires 16 words of dynamic memory, plus six words for each interrupt linkage.
14. Data bases that are loaded into a system with a loadable driver require space equal to the size of the data base.
15. Loaded drivers on a mapped system require space for interrupt linkage as follows:
 - 14 words per interrupt entry for single-controller, non-error-logging drivers,
 - 22 words per interrupt entry for multi-controller, non-error-logging drivers,
 - 14 words for the first (or only) interrupt entry for error-logging drivers, and
 - 6 words for each additional interrupt entry for error-logging drivers.
16. Systems with dynamic checkpoint space allocation require 8 words to describe each checkpoint file and 8 words for each task checkpointed to a checkpoint file.

OPERATING HINTS

17. Systems supporting the memory management directives require 6 words per task (active or fixed) for each region a task is attached to. This includes the task region and all static and dynamic commons.
18. Variable-length packets are allocated for each logged error which has not yet been serviced by the error logger. (See the RSX-11M Error Logging Reference Manual.)

B.3.2 Space Saving Hints

The following list identifies potential methods of saving space:

1. By including the install, request, and remove on exit capability into a generated system, considerable dynamic memory may be saved for tasks that are initiated from a terminal. The MCR RUN command will install the tasks when needed and cause them to be removed when they exit (see the RSX-11M Operator's Procedures Manual). Thus, task control blocks need not be permanently allocated. Typical tasks in this category are the program development and utility tasks provided with the RSX-11M system, (PIP, MAC, TKB, etc.).
2. The use of checkpointing and nonresident tasks, where appropriate, can reduce the number of tasks that are simultaneously in memory. This saves space in a mapped system, since fewer task headers need to be copied.
3. The file system ACP (FllACP) may be built to store File Control blocks in its own task image rather than in the dynamic storage region. The more space allocated at task build time the less the demand will be on the pool. However, if the allocated space becomes used up, the overflow will use the dynamic storage region.
4. The directory least-recently-used table default is three 18-word file control blocks. The effect of this table is a significant increase in the speed of directory operations. If this level of performance is not required, a volume may be mounted using the /LRU keyword, thereby reducing the number of FCBS used.

B.4 PARITY MEMORY SUPPORT

As an option, RSX-11M will support parity memory on all processors. In addition, parity on the PDP-11/70 cache is supported. If a main memory parity error is detected with this option selected, the task occupying the space where the error was detected will be aborted and locked in memory to prevent re-using it. A message will be issued noting the fact that the task was aborted due to a parity error. If the error is detected in the Executive, the system will attempt to print the following message before halting:

*** EXEC PARITY ERROR STOP***

OPERATING HINTS

For 11/70 cache parity errors, the half of the cache in which the parity error was detected will be 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 will not be disabled. With either one or both halves of the cache disabled, the processor will still operate, but in a degraded state. If error logging is supported, cache parity errors will be logged.

B.5 SAVING THE SYSTEM WITH A KW11-Y WATCHDOG TIMER

Before a system with a KW11-Y watchdog timer is saved, the timer must be disabled. There is a switch located on the timer for this purpose. The timer must be disabled because SAVE assumes exclusive control over the system for the duration of the save-and-restore operation and disables clock interrupts. If the KW11-Y is allowed to run during this period, it would time out and cause the alarm to be turned on.

To save a system with the KW11-Y watch dog timer, perform the following steps:

1. Disable the timer (with switch),
2. Save the system, and
3. When the system is up and running, turn the timer on.



APPENDIX C

RMDEMO

C.1 INTRODUCTION

RMDEMO is a privileged task that displays information concerning task activity in an RSX-11M system. The display usually runs continuously on a video terminal with cursor control, such as the VT05B or the VT52. Certain versions of the task will allow a once-only display on any record-oriented device.

The display features include:

1. Current date and time;
2. The currently active task;
3. All tasks, loaded drivers, and common blocks that are currently in memory, displayed in a graphic fashion to show their individual memory requirements and location relative to other tasks;
4. The number of active tasks currently in memory, the number not currently resident, and the total amount of memory occupied by each group;
5. The current amount of available system dynamic memory (POOL space), including the largest available block and the number of fragments;
6. A graphical display of the partition information;
7. The number of hours that have elapsed since RMDEMO was initiated; and
8. The number of free blocks available on the system device and one or more additional mounted FILES-11 volumes.
9. The system error count sequence.

RMDEMO will scale the display to the memory size of the computer on which it is executed. The amount of memory displayed on the screen will always be the next largest power of 2 in K-words. For a 28K system, 32K will be displayed. For a 256K system, 256K will be displayed and the available memory will just fill the screen.

Task locations and sizes displayed by RMDEMO should be considered approximate. RMDEMO is primarily designed to provide a visual display and system debugging tool; it should not be used for accurate measurement of task size and location.

RMDEMO

C.2 HARDWARE REQUIREMENTS

The dynamic version of RMDEMO needs either a VT05B or a VT52 for its constantly changing display. The buffered, once-only version will output a single screen image on any record oriented device or conditionally to a file.

RMDEMO will run on either an RSX-11M or RSX-11S system. It is non-overlaid, and requires approximately 3K for a version that supports only cursor control terminals with all available display options included. The largest version that includes all of the above plus the ability to output a display image to a file will take approximately 7K.

RMDEMO uses the space between the end of its task image and the end of its partition to buffer the screen information. The number of tasks and mounted FILES-11 devices for which space is required for RMDEMO to execute is set by assembly constants. (The distributed object file is configured to require enough space for twenty tasks and two FILES-11 devices.) If the available space is not adequate for the minimum storage requirements configured into the task, whether or not there are actually that many active tasks or loaded drivers, RMDEMO will exit with the message: "INSUFFICIENT TASK LIST BUFFER SPACE. INSTALL TASK WITH A LARGER INCREMENT." At this point the user has two options: first, install RMDEMO in a larger partition; and second, reassemble RMDEMO to require space for fewer tasks. Should there be more active tasks than the buffer can accommodate, RMDEMO will display as many as available space permits.

C.3 BENEFITS OF USING RMDEMO

In general, RMDEMO is a useful task designed to allow either an operator or a user to view the current state of the operating system. The information is presented in a graphic, easily comprehensible form.

There are a number of specific instances in which RMDEMO can help to locate certain system lockout problems or bugs in application and/or system-level software.

1. Bugs and other situations that cause exhaustion of system dynamic memory (resulting in unexplained system hangs) may be detected and more easily reproduced and diagnosed.
2. Task checkpointing and swapping may be monitored -- and in systems with limited memory, deadlock conditions may often be more easily diagnosed.
3. Because RMDEMO provides a real-time view of the free space on a number of FILES-11 devices, it may be used to monitor situations where online storage is at a premium or where some program is running wild.

RMDEMO

C.4 EXPLANATION OF THE OUTPUT

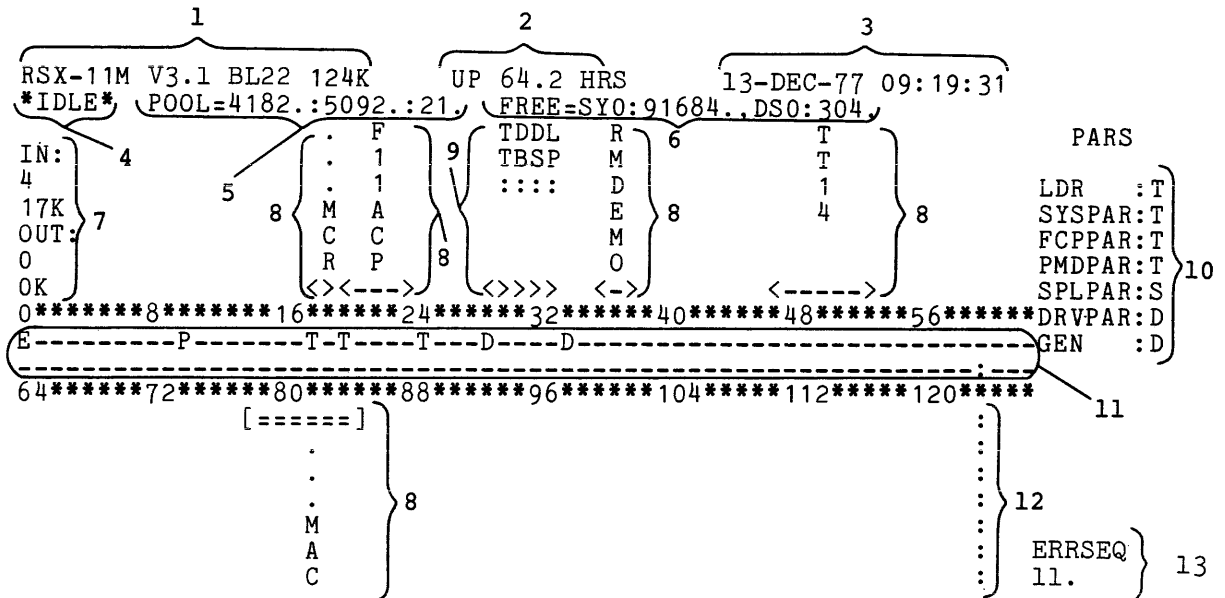


Figure C-1
Example of RMDEMO Display

1. The current version number of the system, base level, and memory size.
2. The elapsed time (in hours) since RMDEMO was initiated. If RMDEMO is initiated in the STARTUP.CMD file, this value closely approximates the system UPTIME (i.e. the time since the last boot).

The time is calculated in such a way that it is tolerant to a change in the system time caused by use of the TIM command. The greatest difference that a TIM command can make to the UPTIME figure is one minute. Further, it is tolerant to delays of up to one minute in the execution of the task. These delays may occur for a number of reasons, including pressing the COPY key on VT52 terminals that are so equipped.
3. Current date and time.
4. Currently executing task; *IDLE* indicates that no task is executing (the Executive is executing the idle loop).
5. Pool information. POOL=X:Y:Z where:

X = the size of the largest free block in the POOL (in words);
 Y = the total number of free words on the POOL;
 Z = the number of fragments in the POOL free list.

6. Number of free blocks on SY0: and the next mounted FILES-11 device encountered in scanning the device list.
7. Number of active tasks in memory, with the amount of memory they occupy. Also included are the number of active tasks not currently memory resident (i.e., swapped out), with the total memory that they would require.

RMDEMO

- Each task in memory is displayed in the "task display" portion of the screen. The task name is listed vertically, and the memory the task occupies is represented by brackets and lines below (or above) the task name.

The particular form of the brackets and lines used to show the memory requirements of the task have a special meaning.

< > means a task is active.
[] means a task is not active, yet occupies memory.
() indicates a common area; the name displayed is the common name.

--- means a task is not fixed-in-memory.
=== means a task is fixed-in-memory.

- Loadable drivers that are loaded. The device mnemonic is displayed instead of the task name.
- Partitions in system. The partition name comes first, with a letter to show the type of the partition. The letters are defined as follows:

T = task partition,
S = subpartition,
D = system-controlled (dynamic) partition,
C = common partition.

- Partition tick marks. The beginning of each partition is marked by a letter. The letters for the partitions are the same as the letters in 10 above, and include the following additional information:
E = system Executive,
P = system POOL space,
: = end of physical memory.
- The memory fence. This line shows the end of physical memory. If the available memory exactly fills the screen, the fence is not displayed.
- The system error count sequence recorded by the error logger. If error logging is not included in the system, ERRSEQ is always zero.

C.5 CONFIGURATION OPTIONS

A number of assembly configuration parameters are available with RMDEMO. They are detailed more closely in the source of the program. They include:

- Support for the VT05B or VT52. Both object libraries are distributed.
- Output one screen image on a standard record-oriented device. It may also be generated to output the one screen image to the file RMDLOG.LST. Because the output device for the file is LS0:, the RMDEMO user must either use the MCR ASN command to direct the file to the appropriate disk or modify the source code appropriately.
- The IN: and OUT: statistics may be moved to other portions of the screen if they overlap the lowest tasks in memory.

RMDEMO

- The number of FILES-11 devices displayed in the free space listing may be changed.
- The minimum number of tasks for which space is required may be changed.

Additional parameters may be altered to yield different versions of RMDEMO. The source file contains extensive comments and should be examined for explanations of these features.



APPENDIX D
EXAMPLE SYSGEN

The following is a console listing from an actual SYSGEN performed on-line using the dual RK05 distribution kit.

The Executive features include:

- Files-11 ACP support
- RMS record locking and placement control support
- Checkpointing
- Dynamic checkpoint allocation
- Dynamic memory allocation
- Automatic memory compaction
- Multi-user protection support
- Online user mode diagnostics support
- Loadable device driver support

This SYSGEN is intended for a mapped system.

EXAMPLE SYSGEN

```

>SET /UIC=[200,200]
>@DK1:PRESYSGEN
>
>; PRESYSGEN <VERSION 03.1>
>;
>; COPYRIGHT (C) 1977
>; DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
>;
>;
>; INITIALIZE SYSTEM FOR DUAL RK05 SYSGEN
>;
>; THIS COMMAND FILE WILL PREPARE THE BASLINE DISK FOR USE
>; BY THE SYSTEM GENERATION PROGRAMS.
>;
>;
>; THE DUAL RK05 DISTRIBUTION KIT REQUIRES AT LEAST:
>;
>; 24K WORDS OF MEMORY, AND
>;
>; ONE RK05 REMOVABLE PLATTER DISK DRIVE, PLUS
>; ONE RK05F FIXED PLATTER DISK DRIVE
>; OR
>; TWO RK05 REMOVABLE PLATTER DISK DRIVES.
>;
>* DOES THIS SYSTEM MEET THE ABOVE REQUIREMENTS? [Y/N]:Y
>SET /UIC=[1,1]
>;
>; BEFORE STARTING SYSGEN, YOU MUST MAKE A COPY OF THE DISTRIBUTION
>; KIT. THIS WILL ENSURE THAT YOUR DISTRIBUTION KIT IS COMPLETE AND
>; SERVE AS A BACKUP. AS THE BASLINE, EXECSRC, AND SYSTEM DISKS ARE
>; ALTERED BY SYSGEN, IT IS USUALLY NECESSARY TO USE A NEW COPY EACH
>; TIME.
>;
>* HAVE YOU COPIED THE DISTRIBUTION KIT AS REQUIRED? [Y/N]:Y
>* IN WHICH RK05 UNIT IS THE BASLINE DISK MOUNTED? [0 R:0-3]: 1
>ASN DK1:=SY:
>* ARE YOU RUNNING SYSGEN STANDALONE? [Y/N]:N
>;
>; IN ORDER TO PERFORM A SYSGEN ON-LINE, THE FOLLOWING TASKS MUST BE
>; INSTALLED: EDI, FLX, INI, MAC, PIP, TKB, AND UFD. THESE TASKS MUST
>; REMAIN INSTALLED ON THE RUNNING SYSTEM UNTIL THE SYSGEN PROCESS IS
>; COMPLETE. WE WILL PAUSE NOW TO ALLOW YOU TO INSTALL THE REQUIRED
>; TASKS.
>;
AT. -- PAUSING. TO CONTINUE TYPE "RES ...AT."
>RES ...AT.
AT. -- CONTINUING
>
>ASN DK1:=LB:
>* DOES THE RUNNING SYSTEM HAVE TWO REMOVABLE RK05 DISK DRIVES? [Y/N]:Y
>* ARE YOU GENERATING A MAPPED SYSTEM? [Y/N]:Y
>SET /UIC=[1,54]
>PIP [1,54]/RE/NV=[1,50]BADSYS.*;*,DSCSYS.*;*,PRESRV.*;*
>PIP [1,50]*.*;*/DE
>* ENTER THE UNIT NUMBER OF THE EMPTY RK05 DRIVE [0 R:0-3]: 0
>;
>; PLACE THE EXECSRC DISK IN DK0: AND START IT UP (WRITE ENABLED)
>;
>* IS THE EXECSRC DISK READY? [Y/N]:Y
>MOU DK0:EXECSRC
>ASN DK0:=SY:
>SET /UIC=[1,1]
>PIP LB:/CO=RSXMAC.SML
>;
>; SYSGEN PART 1 <VERSION 03.1>

```


EXAMPLE SYSGEN

```
> ;
> ; COPYRIGHT (C) 1975, 1976, 1977
> ; DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
> ;
> ; DETERMINE SYSTEM FEATURES AND ASSEMBLE THE EXECUTIVE
> ;
> SET /UIC=[200,200]
> ;
> ; EXPANDED COMMENTS PROVIDE A DESCRIPTION OF EVERY STEP IN THIS
> ; SYSGEN COMMAND FILE. ON THE OTHER HAND, SHORT COMMENTS
> ; PROVIDE VIRTUALLY NO EXPLANATORY TEXT.
> ;
> * DO YOU WANT EXPANDED COMMENTS? [Y/N]:Y
> * DO YOU HAVE THE SINGLE RK05 DISTRIBUTION KIT? [Y/N]:N
> * DO YOU HAVE THE DUAL RK05 DISTRIBUTION KIT? [Y/N]:Y
> ASN DK0:=SY:
> ASN DK1:=LB:
> ;
> ; DUE TO DISK SPACE RESTRICTIONS ON THE RK05 DISTRIBUTION KIT
> ; (BOTH RK DISK AND MAGTAPE KITS) DRIVERS WHICH WILL NOT
> ; BE USED IN YOUR TARGET SYSTEM MUST BE DELETED.
> ;
> * HAVE YOU ALREADY DELETED THE DRIVER SOURCE MODULES? [Y/N]:N
> ;
> ; WE WILL NOW DELETE THE UNUSED DRIVER MODULES. THIS WILL MAKE
> ; ROOM FOR COMPLETING THE SYSGEN AND ALSO ROOM FOR CORRECTIONS
> ; TO THE EXECUTIVE WHICH ARE PUBLISHED IN THE SOFTWARE
> ; DISPATCH. IN GENERAL THIS WILL NOT CAUSE PROBLEMS
> ; SINCE RSX11M SUPPORTS A NUMBER OF PERIPHERAL DEVICES
> ; WHICH HAVE BEEN SUPERSEDED BY THOSE OF NEWER DESIGN.
> ; FOR EXAMPLE:
> ; IF YOU HAVE AN RP04/05/06 YOU PROBABLY DON'T HAVE AN RPR02/03
> ; IF YOU HAVE AN RS03/RS04 YOU PROBABLY DON'T HAVE AN RF11
> ; IF YOU HAVE A TU16/45 YOU PROBABLY DON'T HAVE A TU10
> ; IF YOU HAVE A DMC11 YOU PROBABLY DON'T HAVE A DA11-B
> ; AND SO ON.
> ;
> ; IF AT A LATER DATE, YOU ACQUIRE A DEVICE WHOSE DRIVER HAS BEEN
> ; DELETED FROM THIS DISK, YOU CAN EASILY RETRIEVE IT FROM THE
> ; ORIGINAL DISTRIBUTION DISK AND PUT IT ON THIS DISK.
> ;
> SET /UIC=[11,10]
> * DO YOU HAVE ANY AD01-D A/D CONVERTER CONTROLLERS? [Y/N]:N
> PIP ADDR.V.MAC;*/DE
> * ANY AFC11 A/D CONVERTER CONTROLLERS? [Y/N]:N
> PIP AFDRV.MAC;*/DE
> * ANY AR11 LABORATORY PERIPHERAL SYSTEM CONTROLLERS? [Y/N]:N
> PIP ARDRV.MAC;*/DE
> * ANY CR11/CM11 CARD READER CONTROLLERS? [Y/N]:N
> PIP CRDRV.MAC;*/DE
> * ANY TA11/TU60 CASSETTE DRIVES? [Y/N]:N
> PIP CTDRV.MAC;*/DE
> * ANY RJ/RWP04/05/06 DISK DRIVES? [Y/N]:N
> PIP DBDRV.MAC;*/DE
> * ANY RF11 FIXED HEAD DISK DRIVES? [Y/N]:N
> PIP DFDRV.MAC;*/DE
> * ANY RK11/RK03/05 DISK DRIVES? [Y/N]:Y
> * ANY RL11/RL01 DISK DRIVES? [Y/N]:N
> PIP DLDRV.MAC;*/DE
> * ANY RK611/RK06 DISK DRIVES? [Y/N]:Y
> * ANY RP11/RPR02/RP03 DISK DRIVES? [Y/N]:N
> PIP DPDRV.MAC;*/DE
> * ANY RWM03 DISK DRIVES? [Y/N]:N
> PIP DRDRV.MAC;*/DE
> * ANY RJ/RWS03/04 FIXED HEAD DISK DRIVES? [Y/N]:Y
> * ANY TC11/TU56 DECTAPE DRIVES? [Y/N]:Y
> * ANY RX11/RX01 FLOPPY DISK DRIVES? [Y/N]:Y
> * ANY VT11/VS60 GRAPHICS DISPLAYS? [Y/N]:N
```

EXAMPLE SYSGEN

```

>PIP GRDRV.MAC;*/DE
>* ANY LPA11 LABORATORY PERIPHERAL ACCELERATORS? [Y/N]:N
>PIP LADRV.MAC;*/DE
>* ANY LP11/LS11/LV11/LA180 PRINTERS? [Y/N]:Y
>* ANY LPS11 LABORATORY PERIPHERAL SYSTEMS? [Y/N]:N
>PIP LSDRV.MAC;*/DE
>* ANY TJ/TWU16/45/TE16 TAPE DRIVES? [Y/N]:Y
>* ANY TM11/TU10/TE10/TS03 TAPE DRIVES? [Y/N]:Y
>* ANY PC11 PAPER TAPE READER/PUNCHES? [Y/N]:N
>PIP PPDRV.MAC;*/DE
>* ANY PR11 PAPER TAPE READERS? [Y/N]:N
>PIP PRDRV.MAC;*/DE
>* ANY ICR/ICS11 INDUSTRIAL CONTROLLERS? [Y/N]:N
>PIP ICDRV.MAC;*/DE,ICOM.MAC;*
>* ANY DRS/DSS11 DIGITAL INPUT/OUTPUT MODULES? [Y/N]:N
>PIP ISDRV.MAC;*/DE,ISCOM.MAC;*,DSSDI.MAC;*
>* ANY UDC11 UNIVERSAL INDUSTRIAL CONTROLLERS? [Y/N]:N
>PIP UDDRV.MAC;*/DE,UDCOM.MAC;*
>* ANY DA11-B UNIBUS LINKS? [Y/N]:N
>PIP XBDRV.MAC;*/DE
>* ANY DL11-E ASYNCHRONOUS LINES? [Y/N]:N
>PIP XLDRV.MAC;*/DE
>* ANY DMC11 INTERPROCESSOR LINKS? [Y/N]:N
>PIP XMDRV.MAC;*/DE
>* ANY DP11 SYNCHRONOUS LINE INTERFACES? [Y/N]:N
>PIP XPDRV.MAC;*/DE
>* ANY DQ11 SYNCHRONOUS LINE INTERFACES? [Y/N]:N
>PIP XQDRV.MAC;*/DE
>* ANY DU11 SYNCHRONOUS LINE INTERFACES? [Y/N]:N
>PIP XUDRV.MAC;*/DE
>* ANY DUP11 SYNCHRONOUS LINE INTERFACES? [Y/N]:N
>PIP XWDRV.MAC;*/DE
>SET /UIC=[200,200]
>PIP SYSGEN0.CMD;*/DE
>* ARE YOU BUILDING AN RSX-11S SYSTEM? [Y/N]:N
>* ARE YOU BUILDING A MAPPED SYSTEM? [Y/N]:Y
>* ARE YOU RUNNING ON A MACHINE WITH AT LEAST 24K WORDS? [Y/N]:Y
>;
>* ARE YOU RUNNING ON A MACHINE WITH A LINE PRINTER? [Y/N]:Y
>* IS IT A 132. COLUMN LINE PRINTER? [Y/N]:Y
>* WILL YOUR SYSTEM INCLUDE DSS-11 SUPPORT? [Y/N]:N
>* WILL YOUR SYSTEM INCLUDE ICS/ICR-11 SUPPORT? [Y/N]:N
>* WILL YOUR SYSTEM INCLUDE UDC-11 SUPPORT? [Y/N]:N
>SET /UIC=[11,10]
>;
>; NOW WE BEGIN THE SYSGEN QUERY SECTION TO SELECT THE EXECUTIVE
>; FEATURES AND PERIPHERAL DEVICES WE WANT IN THE NEW SYSTEM.
>;
>* LONG DIALOGUE DESIRED FOR EXECUTIVE/PROCESSOR OPTIONS? [Y/N]:Y
>;
>; SYSGEN PRODUCES INDIRECT FILES WHICH ARE SUBSEQUENTLY USED TO
>; ASSEMBLE THE USER-TAILORED EXECUTIVE. LISTING PRODUCTION IS
>; TIME CONSUMING AND IS NOT RECOMMENDED, ESPECIALLY IF THE 8K
>; ASSEMBLER IS BEING USED (WHICH IT MUST BE ON A 16K SYSTEM).
>;
>* ASSEMBLY LISTING FILES DESIRED? [Y/N]:N
>;
>; A TASK BUILDER MAP IS STRONGLY RECOMMENDED. ESTABLISHING
>; PARTITIONS AND DIAGNOSING SYSTEM FAILURES REQUIRE THIS MAP.
>;
>* TASK BUILDER MAP DESIRED? [Y/N]:Y
>;
>; FOR ALL DISTRIBUTION KITS, IT IS RECOMMENDED THAT YOU SPECIFY
>; SYO FOR THE MAP DEVICE.
>;
>* WHAT IS TO BE THE MAP DEVICE? [DDU] [S]: SYO
>;
>; SPOOLING WILL ONLY ACTUALLY OCCUR FOR DIRECTORY DEVICES.

```

EXAMPLE SYSGEN

```
> NOTE THAT THE BASELINE SYSTEM DOES NOT INCLUDE A PRINT SPOOLER.
>
> * SPOOL MAP FILE? [Y/N]:Y
>
> THE PRECEDING QUERIES DO NOT AFFECT THE USER-TAILORED
> EXECUTIVE. THE EXECUTIVE OPTION QUERIES THAT FOLLOW WHICH ARE
> PRECEDED BY A SINGLE ASTERISK ARE INCLUDED IN THE BASELINE
> SYSTEM. THE FEATURE, HOWEVER, IS NOT ESSENTIAL TO THE
> OPERATION OF A MINIMUM SYSTEM. DOUBLE ASTERISKED QUERIES MUST
> BE SELECTED FOR FULL SUPPORT OF THE MINIMUM SYSTEM. QUERIES
> WITH NO ASTERISKS ARE NOT IN THE MINIMUM SYSTEM AND ARE
> OPTIONAL.
>
> BEGIN EXECUTIVE SERVICE OPTIONS.
>
>
> FAILURE TO INCLUDE THIS OPTION ELIMINATES ALL THE SERVICES
> DESCRIBED IN THE RSX-11 I/O OPERATIONS REFERENCE MANUAL. SINCE
> DEC SUPPLIED SOFTWARE MAKES USE OF THESE SERVICES, THEIR
> ELIMINATION IS NOT RECOMMENDED.
>
> * **DO YOU WANT FILES-11 ACP SUPPORT? [Y/N]:Y
>
> THIS OPTION IS REQUIRED IF YOU WANT RMS-11 RECORD LOCKING
> (SHARED WRITE) AND/OR PLACEMENT SUPPORT.
>
> * DO YOU WANT RMS RECORD LOCKING AND PLACEMENT CONTROL SUPPORT? [Y/N]:Y
>
> IF TASKS ARE TO BE DISPLACED FROM A PARTITION TO YIELD THE
> PROCESSOR RESOURCES TO A TASK OF HIGHER PRIORITY ABLE TO USE
> THE PARTITION, THEN CHECKPOINTING IS REQUIRED.
>
> * **DO YOU WANT CHECKPOINTING? [Y/N]:Y
>
> SELECTION OF THIS OPTION ALLOWS CHECKPOINTING INTO A SYSTEM
> CHECKPOINT FILE RATHER THAN REQUIRING SPACE IN EACH TASK IMAGE.
>
> * DO YOU WANT DYNAMIC CHECKPOINT ALLOCATION? [Y/N]:Y
>
> THIS OPTION ALLOWS AS MANY TASKS AS WILL FIT IN A PARTITION TO
> BE SIMULTANEOUSLY RESIDENT. THE ALLOCATION OF PARTITION MEMORY
> IS AUTOMATIC AND IS CARRIED OUT DYNAMICALLY BY THE RSX-11M
> EXECUTIVE.
>
> * DO YOU WANT DYNAMIC MEMORY ALLOCATION SUPPORT? [Y/N]:Y
>
> AUTOMATIC MEMORY COMPACTION MINIMIZES THE EFFECTS OF
> FRAGMENTATION IN DYNAMICALLY ALLOCATED PARTITIONS. IT IS
> INVOKED WHEN FREE SPACE EXISTS BETWEEN RESIDENT
> NONCHECKPOINTABLE TASKS AND TASKS ARE WAITING TO BE LOADED
> INTO THE PARTITION.
>
> * DO YOU WANT AUTOMATIC MEMORY COMPACTION? [Y/N]:Y
>
> THE MEMORY MANAGEMENT DIRECTIVES PROVIDE TASKS WITH A
> PROTECTED MECHANISM BY WHICH THEY CAN DYNAMICALLY CREATE AND
> DELETE COMMON BLOCKS AND DYNAMICALLY MODIFY THEIR PHYSICAL
> ADDRESS SPACE MAPPING.
>
> * DO YOU WANT THE MEMORY MANAGEMENT DIRECTIVES? [Y/N]:N
>
> MULTI-USER PROTECTION PREVENTS ONE USER FROM INTERFERING WITH
> THE OPERATION OF ANOTHER BY PROVIDING FOR PUBLIC AND PRIVATE
> DEVICE OWNERSHIP AND LOGON/LOGOFF WITH PASSWORD PROTECTION.
> SELECTION OF THIS FEATURE AUTOMATICALLY INCLUDES TERMINAL
> DRIVER SUPPORT FOR READ WITH SPECIAL TERMINATOR, BREAKTHROUGH
> WRITE, AND READ WITH NO ECHO.
>
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EXAMPLE SYSGEN

>* DO YOU WANT MULTI-USER PROTECTION SUPPORT? [Y/N]:Y
>!
>| SELECTION OF ANSI MAGTAPE SUPPORT PROVIDES VOLUME AND FILE
>| LABELING WHICH CONFORMS TO THE ANSI STANDARD FOR INDUSTRY
>| COMPATIBLE TAPE. THIS OPTION REQUIRES EXECUTIVE AST SUPPORT.
>!
>* DO YOU WANT ANSI MAGTAPE ACP SUPPORT? [Y/N]:N
>!
>| USER MODE DIAGNOSTIC SUPPORT ENABLES THE EXECUTIVE AND DEVICE
>| DRIVERS TO SERVICE SPECIAL I/O FUNCTIONS AND RETURN ADDITIONAL
>| DEVICE STATUS INFORMATION AS REQUIRED BY ONLINE DIAGNOSTIC
>| TASKS.
>!
>* DO YOU WANT SUPPORT FOR ONLINE, USER MODE DIAGNOSTICS? [Y/N]:Y
>!
>| LOADABLE DEVICE DRIVER SUPPORT ALLOWS MOST DEVICE DRIVERS TO
>| BE REMOVED FROM THE EXECUTIVE. THEY CAN BE LOADED AND UNLOADED
>| ALMOST AT WILL. AT THIS POINT ONLY THE PROCESS CONTROL DRIVERS
>| (UDC, ICS/ICR, AND DRS/DSS DRIVERS) AND THE VT11/VS60 GRAPHICS
>| DRIVER CAN NOT BE LOADABLE. LOADING OF THE TERMINAL DRIVER IS
>| RESERVED FOR VMR LOAD.
>!
>| NOTE: LOADABLE DRIVER SUPPORT IN RSX-11S IS LIMITED TO VMR.
>!
>* *DO YOU WANT LOADABLE DEVICE DRIVER SUPPORT? [Y/N]:Y
>!
>| AS DISTRIBUTED, THE RSX-11M SOURCE DISK PROVIDES FOR THE
>| GENERATION OF AN RSX-11M OR RSX-11S EXECUTIVE THAT CONTAINS
>| SUPPORT FOR NETWORK COMMUNICATIONS. IN ORDER TO GENERATE SUCH
>| A SYSTEM YOU MUST HAVE THE APPROPRIATE NETWORK SOFTWARE
>| LICENSE.
>!
>* DO YOU WANT NETWORK ACP SUPPORT? [Y/N]:N
>!
>| IF YOU INTEND TO USE THE K-SERIES LAB PERIPHERALS SUPPORT
>| ROUTINES, THE LPA11 LAB. PERIPHERAL ACCELERATOR, THE PRINT
>| SPOOLER, THE FORTRAN ISA PROCESS CONTROL SUBROUTINE CALLS,
>| ANSI MAGTAPE, OR UNSOLICITED TERMINAL AST'S, THEN
>| ASYNCHRONOUS SYSTEM TRAP PROCESSING SUPPORT IS REQUIRED.
>| SEE THE EXECUTIVE REFERENCE MANUAL FOR A DETAILED DESCRIPTION
>| OF THE AST FACILITY PROVIDED IN RSX-11M/S.
>!
>* DO YOU WANT AST SUPPORT? [Y/N]:Y
>!
>| ABNORMAL TASK TERMINATION AND DEVICE NOT READY MESSAGES ARE
>| AUTOMATICALLY PRODUCED BY THE SYSTEM IF THIS OPTION IS
>| SELECTED. THIS OPTION IS REQUIRED IF PMD SUPPORT IS DESIRED.
>!
>* **DO YOU WANT TASK TERMINATION AND DEVICE NOT READY MESSAGES? [Y/N]:Y
>!
>| IF THE POWER FAILS AND THIS OPTION IS INCLUDED, SYSTEM OPERATION
>| IS AUTOMATICALLY COMMENCED WHEN POWER IS RESTORED.
>!
>* DO YOU WANT POWERFAIL RECOVERY? [Y/N]:N
>!
>| REQUIRED IF DEC SUPPLIED PROGRAM DEVELOPMENT SOFTWARE (I.E.
>| TKB, MAC, ETC.) IS TO BE RUN.
>!
>* **DO YOU WANT GET PARTITION PARAMETERS DIRECTIVE? [Y/N]:Y
>!
>| THIS DIRECTIVE PROVIDES THE CAPABILITY TO READ THE PROCESSOR
>| SWITCH REGISTER AND RETURN ITS CONTENTS TO THE REQUESTING TASK.
>| NOTE THAT SOME PROCESSORS DO NOT HAVE A CONSOLE SWITCH REGISTER
>| AND, THEREFORE, CANNOT SUPPORT THIS DIRECTIVE.
>!
>* DO YOU WANT GET SENSE SWITCHES DIRECTIVE? [Y/N]:Y
>!
>| REQUIRED IF DEC SUPPLIED PROGRAM DEVELOPMENT SOFTWARE (I.E.

EXAMPLE SYSGEN

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> TKB, MAC, ETC.) IS TO BE RUN.
>
> *DO YOU WANT GET TASK PARAMETERS DIRECTIVE? [Y/N]:Y
>
> THESE DIRECTIVES PROVIDE THE CAPABILITY FOR COOPERATING TASKS
> TO COMMUNICATE VIA SYSTEM MAINTAINED MESSAGE QUEUES. IF THE
> TARGET SYSTEM WILL CONTAIN THE PRINT SPOOLER, OR IF LPA11-K
> POWERFAIL SUPPORT OR ANSI MAGTAPE SUPPORT IS DESIRED, THIS
> OPTION MUST BE INCLUDED.
>
> * DO YOU WANT SEND/RECEIVE DIRECTIVES? [Y/N]:Y
>
> THIS DIRECTIVE ALLOWS A TASK TO ALTER ITS OWN OR ANOTHER TASK'S
> PRIORITY AT EXECUTION TIME. ITS INCLUSION WILL ALSO ALLEVIATE
> THE PROBLEMS WITH ABORTED, NON-RESIDENT TASKS.
>
> * DO YOU WANT ALTER PRIORITY DIRECTIVE? [Y/N]:Y
>
> THIS DIRECTIVE ALLOWS A TASK TO CONNECT AN INTERRUPT VECTOR
> TO AN INTERRUPT SERVICE ROUTINE IN ITS OWN SPACE. IT IS REQUIRED
> IF K-SERIES LABORATORY PERIPHERALS SUPPORT IS DESIRED.
>
> * DO YOU WANT CONNECT TO INTERRUPT VECTOR DIRECTIVE? [Y/N]:N
>
> THIS DIRECTIVE ALLOWS A TASK TO INCREASE ITS ADDRESS SPACE AT
> EXECUTION TIME.
>
> * DO YOU WANT EXTEND TASK DIRECTIVE? [Y/N]:Y
>
> SELECTION OF THIS OPTION WILL SIGNIFICANTLY INCREASE SYSTEM I/O
> THROUGHPUT AT THE EXPENSE OF ADDITIONAL EXECUTIVE CODE.
>
> * DO YOU WANT QUEUE I/O SPEED OPTIMIZATIONS? [Y/N]:Y
>
> I/O THROUGHPUT IS ENHANCED BY PRE-ALLOCATING A NUMBER OF I/O
> PACKETS FROM THE POOL, LEAVING THEM AVAILABLE FOR QUICK USE BY
> QUEUE I/O.
>
> * HOW MANY I/O PACKETS SHOULD BE PRE-ALLOCATED? [D R:1.-15.]: 15
>
> AN ADDITIONAL SPEED IMPROVEMENT IS ACHIEVED BY OPTIMIZING DATA
> TRANSFERS IN THE EXECUTIVE MODULE 'BLXIO'. ONE IMPROVEMENT IS
> THE USE OF A SERIES OF 'MOV' INSTRUCTIONS WHICH IS USED IN LIEU
> OF A LOOP. THIS IS CALLED THE DATA TRANSFER VECTOR.
>
> * ENTER SIZE OF DATA TRANSFER VECTOR IN WORDS [D R:4.-33.]: 33
>
> THIS FACILITY OF MCR CAN SUBSTANTIALLY REDUCE THE NUMBER OF
> INSTALLED TASKS NEEDED FOR CONVENIENT SYSTEM OPERATION. SEE
> DESCRIPTION OF THE RUN COMMAND IN THE RSX-11M OPERATOR'S
> PROCEDURES MANUAL FOR DETAILS.
>
> *DO YOU WANT INSTALL, REQUEST, AND REMOVE ON EXIT SUPPORT? [Y/N]:Y
>
> LOGICAL DEVICE ASSIGNMENT PROVIDES THE CAPABILITY TO ASSOCIATE
> A LOGICAL NAME TO A PHYSICAL DEVICE UNIT. ASSIGNMENTS MAY BE
> MADE ON A PER TERMINAL OR SYSTEM WIDE BASIS.
>
> *DO YOU WANT LOGICAL DEVICE ASSIGNMENT SUPPORT? [Y/N]:Y
>
> THE NULL DEVICE WILL ALWAYS RETURN THE I/O STATUS FOR SUCCESS-
> FUL COMPLETION FOR AN OUTPUT REQUEST AND END-OF-FILE FOR AN
> INPUT REQUEST. IT IS VERY USEFUL TO ASSIGN IT AS THE OUTPUT
> DEVICE WHEN USING PRE-WRITTEN COMMAND FILES FOR WHICH CERTAIN
> TYPES OF OUTPUT SHOULD BE SUPPRESSED. THE NULL DEVICE DRIVER
> IS NOT LOADABLE.
>
> *DO YOU WANT A NULL DEVICE? [Y/N]:Y
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EXAMPLE SYSGEN

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>
> THE USER ORIENTED TERMINAL DRIVER CONTAINS THOSE FEATURES FOUND
> MOST DESIRABLE BY USERS ON A PROGRAM DEVELOPMENT SYSTEM. THE
> FOLLOWING FEATURES ARE INCLUDED:
>
> - AUTOMATIC CARRIAGE RETURN/LINE FEED
> - BREAKTHROUGH WRITE
> - TASK CHECKPOINTING DURING TERMINAL INPUT (NEEDS EXEC SUPPORT)
> - UNSOLICITED INPUT CHARACTER AST (NEEDS EXEC SUPPORT)
> - WRITE WITH CONTROL-O CANCELLATION
> - CONTROL-R SUPPORT
> - GET TERMINAL CHARACTERISTICS
> - GET TERMINAL DRIVER SUPPORT
> - SETTABLE CASE CONVERSION
> - READ WITH NO ECHO
> - READ AFTER PROMPT
> - SPECIAL CHARACTER LINE TERMINATOR SUPPORT
> - CRT RUBOUT
> - TERMINAL-HOST SYNCHRONIZATION
> - TRANSPARENT TERMINAL READ/WRITE
> - VARIABLE LENGTH INPUT BUFFERING
>
> IF MORE OR FEWER FEATURES ARE DESIRED, ANSWER NO.
>* DO YOU WANT THE USER ORIENTED TERMINAL DRIVER? [Y/N]:Y
>
> THE TERMINAL DRIVER NORMALLY CONVERTS A FORM FEED INTO 8 LINE
> FEEDS. CHOOSING THE NEXT OPTION WILL SUPPRESS THIS CONVERSION.
>
> IF YOU HAVE AN LA120 OR LA180S, YOU MUST ANSWER YES TO THE NEXT
> QUESTION.
>
>* DO YOU WANT FORM FEEDS PASSED DIRECTLY TO TERMINALS? [Y/N]:N
>
> IT IS POSSIBLE TO GENERATE AN EXECUTIVE LARGER THAN 16K TO
> INCREASE THE SIZE OF THE EXECUTIVE DYNAMIC STORAGE REGION.
> DOING THIS WILL REDUCE THE SIZE OF PRIVILEGED TASKS WHICH MAP
> INTO THE EXECUTIVE TO 8K.
>
>* DO YOU WANT SUPPORT FOR A 20K EXECUTIVE? [Y/N]:Y
>
> ROUND ROBIN SCHEDULING PROVIDES THE CAPABILITY FOR A GROUP OF
> RESIDENT TASKS WITHIN A RANGE OF PRIORITIES TO SHARE THE
> AVAILABLE PROCESSING TIME. EACH PRIORITY CLASS WITHIN THE RANGE
> IS ROUND ROBIN SCHEDULED AT EACH SCHEDULE INTERVAL (TIME SLICE).
>
>* DO YOU WANT EXECUTIVE LEVEL ROUND ROBIN SCHEDULING? [Y/N]:Y
>
> ROUND ROBIN SCHEDULING IS EXECUTED ON A PERIODIC BASIS.
> A TYPICAL SCHEDULING INTERVAL IS ON THE ORDER OF 100
> MILLISECONDS (6 CLOCK TICKS FOR A 60 CYCLE LINE FREQUENCY
> CLOCK).
>
>* ENTER LENGTH OF SCHEDULE INTERVAL IN TICKS [D R:1.-1000. I:6.]: 6
>
> ROUND ROBIN SCHEDULING IS EXECUTED FOR A RANGE OF PRIORITY
> CLASSES. TYPICAL RANGES ARE 1. TO 100.
>
>* ENTER HIGHEST PRIOR. CLASS TO BE CONSIDERED [D R:1.-249.]: 150
>* ENTER LOWEST PRIOR. CLASS TO BE CONSIDERED [D R:1.-150.]: 1
>
> THE DISK SWAPPING ALGORITHM PROVIDES FOR THE VARIATION OF A
> RESIDENT TASK'S EFFECTIVE PRIORITY WHEN IT IS BEING CONSIDERED
> FOR CHECKPOINTING. A TASK'S EFFECTIVE PRIORITY IS DETERMINED
> BY BIASING ITS RUN PRIORITY WITH A POSITIVE SWAPPING PRIORITY
> EACH TIME IT IS LOADED INTO MEMORY (EG. INITIAL TASK LOAD OR
> CHECKPOINT READ). AS THE TASK CONTINUES TO RESIDE IN MEMORY,
> ITS SWAPPING PRIORITY BECOMES NEGATIVE, EVENTUALLY REACHING
> A LOWER BOUND; IT IS THIS BIAS WHICH IS USED TO DETERMINE
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EXAMPLE SYSGEN

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> EFFECTIVE PRIORITY. EVENTUALLY, THE TASK BECOMES ELIGIBLE FOR
> CHECKPOINTING BY TASKS OF EQUAL PRIORITY WHICH ARE NOT RESIDENT
> (OR BY LOWER PRIORITY TASKS WITHIN THE SPECIFIED RANGE).
>
>* DO YOU WANT EXECUTIVE LEVEL DISK SWAPPING? [Y/N]:Y
>
> SWAPPING PRIORITIES ARE DECREMENTED ON A PERIODIC BASIS.
> A TYPICAL TIME INTERVAL IS ON THE ORDER OF 500 MILLISECONDS (30
> CLOCK TICKS FOR A 60 CYCLE FREQUENCY CLOCK). TYPICALLY, THE
> SWAPPING INTERVAL SHOULD BE AT LEAST 5 TIMES THE ROUND ROBIN
> SCHEDULING INTERVAL.
>
>* ENTER LENGTH OF SWAPPING INTERVAL IN TICKS [D R:1.-5000. D:30.]: 30
>
> WITH A SWAPPING PRIORITY OF "S", A TASK RUNNING AT PRIORITY
> "P" WILL HAVE AN EFFECTIVE PRIORITY RANGE (FOR CHECKPOINTING)
> FROM "P+S" TO "P-S" AS LONG AS IT RESIDES IN MEMORY. THE
> SWAPPING PRIORITY DETERMINES THE RANGE OVER WHICH LOWER
> PRIORITY TASKS MAY CHECKPOINT HIGHER ONES: THE LARGER THE
> SWAPPING PRIORITY, THE GREATER THE RANGE.
>
> A TYPICAL VALUE FOR THIS PARAMETER IS 5.
>
>* WHAT IS THE SWAPPING PRIORITY? [D R:1.-20. D:5.]: 5
>
> ADDITION OF A USER WRITTEN DRIVER REQUIRES THAT ADEQUATE SPACE
> BE ALLOCATED FOR INTERRUPT VECTORS DURING THE ASSEMBLY OF THE
> GENERATED EXECUTIVE. ACTUAL DRIVER INCLUSION OCCURS WHEN THE
> TARGET EXECUTIVE IS BUILT.
>
>* ARE YOU PLANNING TO INCLUDE A USER WRITTEN DRIVER? [Y/N]:N
>
> THE EXECUTIVE DEBUGGING TOOL PROVIDES A SUBSET ODT-11 THAT RUNS
> AS A PART OF THE RSX-11M EXECUTIVE. THIS TOOL ALLOWS
> INTERACTIVE DEBUGGING OF EXECUTIVE MODULES, I/O DRIVERS, AND
> INTERRUPT SERVICE ROUTINES. SELECTION OF THIS OPTION ALSO
> INCLUDES CONSISTENCY CHECK CODE IN THE DYNAMIC MEMORY ROUTINES.
>
>* DO YOU WANT TO INCLUDE THE EXECUTIVE DEBUGGING TOOL? [Y/N]:Y
>
> IF THE SYSTEM CRASHES AND THIS OPTION IS INCLUDED, THE
> EXECUTIVE STACK AND REGISTERS WILL BE DUMPED TO THE SELECTED
> DEVICE.
>
>* DO YOU WANT REGISTER AND STACK DUMP AT SYSTEM CRASH? [Y/N]:Y
>
> THE DEVICE ON WHICH THE STACK AND REGISTER DUMP APPEARS
> MUST BE A TERMINAL OR LINE PRINTER COMPATIBLE DEVICE; THAT
> IS, IT MUST RECEIVE A SINGLE BYTE AT A TIME. THE NORMAL
> DEVICE IS THE CONSOLE TERMINAL WHICH HAS A CSR ADDRESS OF
> 177564.
>
>* ENTER DUMP DEVICE CSR ADDRESS [D R:160000-177700 D:177564]: 177564
>
> SELECTION OF THIS OPTION INCLUDES CODE TO DUMP MEMORY TO
> SECONDARY STORAGE FOR LATER ANALYSIS BY THE CRASH DUMP
> ANALYSIS PROGRAM. THE CRASH DUMP DEVICES SUPPORTED ARE:
> DT, DK, MT, AND MM.
>
>* DO YOU WANT CRASH DUMP ANALYSIS SUPPORT? [Y/N]:Y
>
> THE DEVICE ON WHICH THE CRASH NOTIFICATION APPEARS MUST BE A
> PAPER TAPE, TELETYPE, OR LINE PRINTER COMPATIBLE DEVICE; THAT
> IS, THE DEVICE MUST TRANSMIT A SINGLE BYTE AT A TIME. THE
> NORMAL CRASH OUTPUT DEVICE IS THE CONSOLE TERMINAL WHICH HAS A
> CSR ADDRESS OF 177564.
>
>
>
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EXAMPLE SYSGEN

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>I IN RESPONSE TO THE NEXT QUESTION, ENTER THE CSR ADDRESS OF THE
>I DEVICE ON WHICH THE CRASH NOTIFICATION IS TO APPEAR.
>I
>* ENTER OUTPUT DEVICE CSR ADDRESS [O R:160000-177700 D:177564]: 177564
>I
>I MEMORY CAN BE DUMPED ONTO ANY OF THE FOLLOWING DEVICES:
>I     DT, DK, MT, MM
>I
>* ENTER CRASH MEMORY DUMP DEVICE MNEMONIC [S]: DT
>* WHAT IS ITS CSR ADDRESS [O R:160000-177700 D:177342]: 177342
>* WHAT IS THE PHYSICAL UNIT NUMBER OF CRASH UNIT [O R:0-7 D:0]: 0
>I
>I SELECTION OF ERROR LOGGING WILL CAUSE DISK AND TAPE DEVICE
>I ERRORS TO BE INTERCEPTED AND INFORMATION CONCERNING THEM TO BE
>I WRITTEN INTO A DISK FILE FOR LATER ANALYSIS. NOTE THAT THIS
>I OPTION AUTOMATICALLY INCLUDES SUPPORT FOR CHECKPOINTING AND THE
>I SEND/RECEIVE DIRECTIVES.
>I
>* DO YOU WANT DEVICE ERRORS AND TIMEOUTS LOGGED? [Y/N]:Y
>I
>I SELECTION OF THIS OPTION ALLOWS THE EXECUTIVE TO DETECT THE
>I OCCURRENCE OF TRAPS TO UNUSED INTERRUPT VECTORS AND TO STORE
>I INFORMATION ABOUT THEM IN A FILE FOR LATER ANALYSIS. INCLUDING
>I THIS OPTION ALSO REQUIRES SUPPORT FOR SEND/RECEIVE DIRECTIVES
>I AND CHECKPOINTING.
>I
>* DO YOU WANT UNDEFINED INTERRUPTS LOGGED? [Y/N]:Y
>I
>I SELECTION OF THIS OPTION WILL CAUSE CACHE AND MEMORY PARITY
>I ERROR TRAPS FROM USER TASKS TO BE INTERCEPTED WITH INFORMATION
>I CONCERNING THEM TO BE WRITTEN INTO A FILE FOR LATER ANALYSIS.
>I NOTE THAT THIS OPTION ALSO INCLUDES SUPPORT FOR PARITY MEMORY,
>I CHECKPOINTING, AND THE SEND/RECEIVE DIRECTIVES.
>I
>* DO YOU WANT PARITY ERROR TRAPS LOGGED? [Y/N]:Y
>I
>I A NON ZERO RESPONSE TO THIS QUERY IS REQUIRED. A MINIMUM OF
>I 256 WORDS WILL BE ACCEPTED TO INSURE MINIMUM OPERATIONS. 1024
>I WORDS IS A REASONABLE ESTIMATE FOR ADEQUATE PERFORMANCE OF A
>I SET OF USER TASKS MAKING FULL USE OF THE BASELINE SYSTEM.
>I
>I RESPONSE LIMITS: 256.-16384. MINUS SIZE OF EXECUTIVE
>I
>* **ENTER SIZE OF DYN. STORAGE REGION IN WORDS [D R:256.-16384.]: 1024
>I
>I IF SELECTED, THE SYSTEM WILL, WHEN IDLE, CAUSE THE DATA LIGHTS
>I TO FLICKER IN A PRONOUNCED CIRCULAR ROTATION. THE OPTION
>I FUNCTIONS PROPERLY ONLY ON-PDP-11/45/50/55/70 SYSTEMS.
>I
>* DO YOU WANT ROTATING PATTERN IN DATA LIGHTS? [Y/N]:Y
>I
>I     END EXECUTIVE SERVICE OPTIONS.
>I
>I     BEGIN PROCESSOR OPTIONS.
>I
>I
>I THE PDP-11/70 REQUIRES ADDITIONAL EXECUTIVE SUPPORT IF YOU
>I WISH TO UTILIZE MEMORY ABOVE 124K.
>I
>* IS YOUR TARGET PROCESSOR A PDP-11/70? [Y/N]:Y
>I
>I THE MINIMUM MEMORY IS 16K FOR AN RSX-11M SYSTEM AND 8K FOR AN
>I RSX-11S SYSTEM. THE MAXIMUM MEMORY SIZE IS 1920K FOR AN
>I RSX-11M SYSTEM AND 124K FOR AN RSX-11S SYSTEM. IN ORDER TO
>I UTILIZE MEMORY ABOVE 28K THE TARGET SYSTEM MUST CONTAIN A
>I MEMORY MANAGEMENT UNIT.
>I
>* ENTER SIZE OF PHYS. MEMORY IN 1024 WORD BLOCKS [D R:16.-1920.]: 124

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EXAMPLE SYSGEN

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>#
># THE PDP-11 FLOATING POINT PROCESSOR IS AN OPTIONAL ARITHMETIC
># PROCESSOR. IT PERFORMS ALL FLOATING POINT ARITHMETIC
># OPERATIONS AND CONVERTS DATA BETWEEN INTEGER AND FLOATING POINT
># FORMATS. THIS OPTION IS AVAILABLE ON THE PDP11/34/45/50/55,
># 60 AND 70. THIS SHOULD NOT BE CONFUSED WITH THE FIS
># (FLOATING INSTRUCTION SET) OPTION AVAILABLE WITH THE PDP11/40.
>#
># DO YOU WANT FLOATING POINT PROCESSOR SUPPORT? [Y/N]:Y
>#
># RSX-11M/S REQUIRES A REAL TIME CLOCK FOR ITS OPERATION, EITHER
># THE KW11-P PROGRAMMABLE FREQUENCY OR THE KW11-L LINE FREQUENCY
># CLOCK OR THE DL11-W LINE FREQUENCY CLOCK/CONSOLE INTERFACE MAY
># BE USED.
>#
># DO YOU HAVE A PROGRAMMABLE CLOCK? [Y/N]:N
>#
># LINE FREQUENCY IS EITHER 50 OR 60 HERTZ. IN THE U.S.A. LINE
># FREQUENCY IS ALWAYS 60 HERTZ.
>#
># IS YOUR LINE FREQUENCY 50 HERTZ? [Y/N]:N
>#
># THE KW11-Y IS A WATCHDOG TIMER THAT IS CONSTANTLY ATTEMPTING TO
># TIME OUT SYSTEM ACTIVITY. THE RSX-11M/S EXECUTIVE REFRESHES
># THE TIMER AT EVERY CLOCK INTERRUPT. IF THE SYSTEM FAULTS OR A
># HARDWARE FAILURE OCCURS AND THE TIMER ELAPSES AN EXTERNAL
># SIGNAL IS GENERATED.
>#
># DO YOU WANT KW11-Y WATCHDOG TIMER SUPPORT? [Y/N]:N
>#
># THE PDP-11/70 PROVIDES ADDITIONAL PARITY CHECKING CIRCUITRY.
># THE BUFFER MEMORY (CACHE) USED TO SPEED UP MAIN MEMORY
># OPERATIONS IS ALSO CAPABLE OF GENERATING AND CHECKING PARITY.
>#
># DOES THE TARGET PROCESSOR HAVE A CACHE MEMORY? [Y/N]:N
>#
>#     END PROCESSOR OPTIONS.
>#
>#     BEGIN PERIPHERAL OPTIONS.
>#
># EXPANDED COMMENTS DESIRED FOR PERIPHERAL OPTIONS? [Y/N]:N
>PIP RSXB LD.TMP;*/DE
PIP -- NO SUCH FILE(S)
SYO:[11,10]RSXB LD.TMP;*
># DO YOU WANT DISK WRITECHECK SUPPORT? [Y/N]:Y
># DO YOU HAVE ANY PROCESS I/O OR LABORATORY PERIPHERALS? [Y/N]:N
># HOW MANY CM/CR11 CARD READERS DO YOU HAVE? [D R:0.-16.J]: 0
># HOW MANY T11 DUAL CASSETTES DO YOU HAVE? [D R:0.-16.J]: 0
># HOW MANY RJ/RWP04-05-06 DISK CONTROLLERS HAVE YOU? [D R:0.-16.J]: 1
># DO YOU WANT OFFSET RECOVERY SUPPORT? [Y/N]:
>#
># OFFSET RECOVERY IS A TECHNIQUE FOR READING DATA IN INSTANCES
># WHERE IT CANNOT OTHERWISE BE RECOVERED. IT INVOLVES MOVING THE
># DISK READ HEAD IN SMALL INCREMENTS ABOUT CYLINDER CENTERLINE IN
># AN ATTEMPT TO PICK UP A STRONGER SIGNAL AND THUS ALLOW DATA TO
># BE RECOVERED.
>#
># DO YOU WANT OFFSET RECOVERY SUPPORT? [Y/N]:Y
># DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
># ENTER VECTOR ADDR. OF THE NEXT RJ/RWP04-05-06 [D R:60-774 D:254]: 21\1\54
># WHAT IS ITS CSR ADDRESS? [D R:160000-177700 D:176700]:
># HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.J]: 4
># ENTER PHYSICAL UNIT NUMBER OF THE FIRST DRIVE [D D:0]: 0
># IS THE FIRST DRIVE AN RP04 OR RP05? [Y/N]:N
># IS THE NEXT DRIVE AN RP04 OR RP05? [Y/N]:N
># IS THE NEXT DRIVE AN RP04 OR RP05? [Y/N]:Y
># IS THE NEXT DRIVE AN RP04 OR RP05? [Y/N]:Y
># HOW MANY RF11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.J]:

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EXAMPLE SYSGEN

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>* HOW MANY RK11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: 1
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT RK11 [O R:60-774 D:220]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177404]:
>* ENTER NUMBER OF RK05F FIXED PLATTERS [O R:0-4]:
>* ENTER NUMBER OF RK05 REMOVABLE PLATTERS [D R:1.-8.]: 4
>* HOW MANY RL11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]:
>* HOW MANY RK611 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: 1
>* DO YOU WANT OFFSET RECOVERY SUPPORT? [Y/N]:Y
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT RK611 [O R:60-774 D:210]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177440]:
>* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]: 2
>* IS THE FIRST DRIVE AN RK06? [Y/N]:Y
>* IS THE NEXT DRIVE AN RK06? [Y/N]:Y
>* HOW MANY RP11-C/E DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]:
>* HOW MANY RWM03 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]:
>* HOW MANY RJ/RWS03-04 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: 1
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT RJ/RWS03-04 [O R:60-774 D:204]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172040]:
>* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]: 2
>* ENTER PHYSICAL UNIT NUMBER OF THE FIRST DRIVE [O D:0]: 0
>* IS THE FIRST DRIVE AN RS03? [Y/N]:N
>* IS THE NEXT DRIVE AN RS03? [Y/N]:N
>* HOW MANY TC11 DECTAPE CONTROLLERS DO YOU HAVE? [D R:0.-16.]: 1
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT TC11 [O R:60-774 D:214]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177342]:
>* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]: 2
>* HOW MANY RX11 DISK CONTROLLERS DO YOU HAVE? [D R:0.-16.]: 1
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT RX11 [O R:60-774 D:264]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177170]:
>* HOW MANY DRIVES DOES IT HAVE? [O R:1-2]: 2
>* DO YOU HAVE A VT11 GRAPHICS DISPLAY SUBSYSTEM? [Y/N]:
>* DO YOU HAVE A VS60 GRAPHICS DISPLAY SUBSYSTEM? [Y/N]:
>* HOW MANY LP/LS/LV11/LA180 LINE PRINTERS DO YOU HAVE? [D R:0.-16.]: 1
>* DO YOU WANT FAST PRINTER SUPPORT? [Y/N]:Y
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT LINE PRINTER [O R:60-774 D:200]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177514]:
>* IS IT AN LS11, LA180, OR LP11-V/W? [Y/N]:
>* IS IT A 132. COLUMN PRINTER? [Y/N]:Y
>* DO YOU WANT 15. SECONDS BETWEEN PRINTER NOT READY MESSAGES? [Y/N]:N
>* HOW MANY SECONDS BETWEEN NOT READY MESSAGES [D R:0.-255. D:15.]: 45
>* HOW MANY TMO2/03 MAGTAPE CONTROLLERS HAVE YOU? [D R:0.-16.]: 1
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT TJ/TWU/TWE16-45 [O R:60-774 D:224]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:172440]:
>* HOW MANY DRIVES DOES IT HAVE? [D R:1.-8.]: 2
>* ENTER PHYSICAL UNIT NUMBER OF THE TMO2/03 FORMATTER [O D:0]: 0
>* HOW MANY TM/TMA/TMB11 MAGTAPE CONTROLLERS HAVE YOU? [D R:0.-16.]:
>* HOW MANY PC11 PAPER TAPE READER/PUNCHES DO YOU HAVE? [D R:0.-16.]:
>* HOW MANY PR11 PAPER TAPE READERS DO YOU HAVE? [D R:0.-16.]:
>;
>; INCLUDE CONSOLE IN THE ANSWER TO THE NEXT QUESTION.
>;
>* ENTER NUMBER OF DL11 LINE INTERFACES [D R:1.-16.]: 1
>* DO YOU WANT THE DRIVER TO BE LOADABLE? [Y/N]:Y
>* ENTER VECTOR ADDRESS OF THE NEXT DL11 [O R:60-774 D:60]:
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:177560]:
>* ENTER NUMBER OF DH11 ASYNCHRONOUS LINE MULTIPLEXERS [D R:0.-16.]: 3
>* ENTER TOTAL NUMBER OF DIAL UP LINES [D R:0.-48.]: 4
>* DO YOU WANT TO ANSWER AT 110 BAUD? [Y/N]:
>* DO YOU WANT TO ANSWER AT 150 BAUD? [Y/N]:
>* ENTER TOTAL NUMBER OF LOCAL LINES [D R:29.-44.]: 40
>* ENTER VECTOR ADDRESS OF THE NEXT DH11 [O R:300-774]: 310

```

EXAMPLE SYSGEN

```

>* WHAT IS ITS CSR ADDRESS? [O R:160010-177700]: 160020
>* ENTER VECTOR ADDRESS OF THE NEXT DM11-BB [O R:300-774]: 300
>* WHAT IS ITS CSR ADDRESS? [O R:160000-177700 D:170500]:
>* ENTER VECTOR ADDRESS OF THE NEXT DH11 [O R:300-774]: 320
>* WHAT IS ITS CSR ADDRESS? [O R:160010-177700]: 160040
>* ENTER VECTOR ADDRESS OF THE NEXT DH11 [O R:300-774]: 330
>* WHAT IS ITS CSR ADDRESS? [O R:160010-177700]: 160060
>* ENTER NUMBER OF DJ11 ASYNCHRONOUS LINE MULTIPLEXERS [O R:0.-16.]: 0
>* ENTER NUMBER OF DZ11 ASYNCHRONOUS MULTIPLEXERS [O R:0.-16.]:
>* DO YOU HAVE ANY INTER-PROCESSOR COMMUNICATION DEVICES? [Y/N]:N
>
>      END PERIPHERAL OPTIONS.
>
>PIP RSXMC.MAC=[11,10]RSXMC0.MAC/AP
>PIP RSXBLD.CMD=RSXBLD.TMP;*
>PIP RSXBLD.TMP;*/DE
>
>
>      END SYSGEN QUERY SECTION
>
>
> AT THIS POINT WE RENAME THE ASSEMBLY COMMAND FILE
> AND THE SYSTEM BUILD COMMAND FILE TO [11,24]
>
>PIP [11,24]/RE/NV=RSXASM.CMD;*,RSXBLD.CMD;*
>* DID YOU ANSWER THE SYSGEN QUESTIONS TO YOUR SATISFACTION? [Y/N]:Y
>
> IF YOU ARE BUILDING A SPECIALIZED SYSTEM YOU
> MAY WISH TO EDIT THE FILES WHICH ARE PRODUCED
> BY THE QUERY SECTION.
>
>* DO YOU WANT TO EDIT ANY OF THE QUERY SECTION OUTPUT FILES? [Y/N]:N
>
> NOW WE ASSEMBLE THE EXECUTIVE
>
>
> ASSEMBLING THE EXECUTIVE TAKES ANYWHERE FROM 20 MINUTES (ON AN 11/70)
> TO 4 HOURS (ON AN 11/04). TAKE A BREAK.
>
>SET /UIC=[11,24]
>TIM
15:25:27 16-DEC-77
>MAC @RSXASM

>TIM
15:39:44 16-DEC-77
>
> NOW WE BUILD THE CONCATENATED OBJECT MODULE FILE
> FOR THE EXECUTIVE.
>
>PIP RSX.OBS=*.OBJ
>PIP RSX11M.OBJ/RE=RSX.OBS
>
> NOW WE COPY THE BUILD COMMAND FILE, THE ASSEMBLY PREFIX
> FILE, THE UDC, DSS OR ICS/ICR FILES AND THE CONCATENATED
> OBJECT MODULES TO SECONDARY STORAGE.
>
>SET /UIC=[200,200]
>SET /UIC=[1,24]
>
> COPY THE EXECUTIVE OBJECT MODULE FILE, TASK BUILD
> COMMAND FILE AND UDC OR ICS/ICR FILES TO THE PROPER
> DIRECTORY.
>
>PIP LB:/NV=[11,24]RSXBLD.CMD,RSX11M.OBJ
>PIP LB:[200,200]/NV/UF=[11,10]RSXMC.MAC
>SET /UIC=[200,200]

```

EXAMPLE SYSGEN

```

>DMO DK0:
>
>
> REMOVE THE EXEC SRC DISK FROM DK0:. BEFORE PROCEEDING TO THE NEXT
> PHASE OF SYSGEN, YOU MUST COPY THE SYSTEM DISK, IF YOU HAVEN'T
> DONE SO ALREADY.
>
>* HAVE YOU MADE A COPY OF THE SYSTEM DISK? [Y/N]:Y
>ASN DK0:=SY:
>ASN DK1:=LB:
>
> PUT THE SYSTEM DISK IN DK0: AND START IT UP (WRITE ENABLED).
>
>* IS THE SYSTEM DISK READY? [Y/N]:Y
>MOU DK0:SYSTEM
>
> DELETE MAPPED OR UNMAPPED OBJECT LIBRARIES AND BUILD FILES
>
>SET /UIC=[1,24]
>PIP [1,20]*.*;*/DE
>SET /UIC=[1,54]
>PIP @LB:[200,200]COPYTSK
>PIP /CO=LB:BADSYS.*,DISCSYS.*,PRESRV.*
>
> COPY SYSTEM OBJECT AND BUILD FILES FROM BASLINE DISK
>
>SET /UIC=[1,24]
>PIP /NV=LB:RSXBLD.CMD,RSX11M.OBJ
>PIP [200,200]/NV=LB:[200,200]RSXMC.MAC
>* DO YOU WANT TO CONTINUE WITH THE NEXT PHASE OF SYSGEN? [Y/N]:N
>
> WHEN YOU DO WANT TO CONTINUE, MOUNT THE BASLINE DISK IN DK1:,
> THE SYSTEM DISK IN DK0:, BOOT THE BASLINE DISK, ASSIGN
> DK0:=SY0:, AND START THE COMMAND FILE SY:[200,200]SYSGEN2.CMD.
>
>/
>@ <EOF>

```

```

@DK:[200,200]SYSGEN2
>SET /UIC=[200,200]
>
> SYSGEN PART 2          <VERSION 03.1>
>
> COPYRIGHT (C) 1975, 1976, 1977
> DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
>
> BUILD THE EXECUTIVE AND ALL REQUIRED TASKS
>
>
> EXPANDED COMMENTS PROVIDE A DESCRIPTION OF EVERY STEP IN THIS
> SYSGEN2 COMMAND FILE. ON THE OTHER HAND, SHORT COMMENTS
> PROVIDE VIRTUALLY NO EXPLANATORY TEXT.
>
>* DO YOU WANT EXPANDED COMMENTS FOR SYSGEN PART 2? [Y/N]:Y
>* IN WHICH RK05 UNIT IS THE BASLINE DISK? [0 R:0-3]: 1
>* IN WHICH RK05 UNIT IS THE SYSTEM DISK? [0 R:0-3]: 0
>ASN DK1:=LB:
>ASN DK0:=SY:
>* HAVE YOU ALREADY BUILT THE EXEC? [Y/N]:N
>SET /UIC=[200,200]
>PIP 11SGEN.CMD;*/DE
>
> AS DISTRIBUTED ON THE OBJECT DISK, THE SYSTEM OBJECT
> LIBRARY (SYSLIB) DOES NOT CONTAIN THE FORTRAN RUN TIME

```

EXAMPLE SYSGEN

```

>; SYSTEM MODULES FOR THE LPS-11 MODULES; THE PURDUE ISA MODULES
>; FOR THE UDC, DSS11/DRS11 OR ICS SUBSYSTEMS. THEY MUST BE
>; ADDED IF YOU PLAN TO USE THESE ROUTINES IN YOUR TARGET SYSTEM.
>;
>SET /UIC=[1,1]
>* DO YOU WISH TO ADD THE UDC/LPS/ICS/DSS ROUTINES TO SYSLIB? [Y/N]:N
>PIP PURISA.OBJ;*/DE,PURUDC;*,PURICR;*,LPS;*,LPA;*
>SET /UIC=[1,24]
>;
>; DELETE ALL BUT LATEST VERSION OF EXEC BUILD COMMAND FILE,
>; ASSEMBLY PREFIX FILE, AND ALL EXEC OBJECT LIBRARIES IF ANY.
>;
>PIP RSXBLD.CMD/PU
>PIP RSX11M.OLB;*/DE
PIP -- NO SUCH FILE(S)
SY0:[1,24]RSX11M.OLB;*
>PIP [200,200]RSXMC.MAC/PU
>;
>; NOW WE BUILD THE EXEC LIBRARY
>;
>LBR RSX11M/CR:80.:640.:128.=RSX11M.OBJ
>PIP RSX11M.OBJ;*/DE ! DELETE OBJECT MODULE FILE
>* DO YOU WISH TO ADD USER WRITTEN DRIVER(S) TO THE EXEC? [Y/N]:N
>SET /UIC=[1,24]
>;
>; NOW WE BUILD THE EXECUTIVE
>;
>TKB @RSXBLD
>* DID THE EXECUTIVE BUILD SUCCESSFULLY? [Y/N]:Y
>PIP [1,24]ICBLD.CMD;*/DE,UDCBLD.CMD;*,ISBLD.CMD;*
>;
>; YOU NOW NEED THE MAP OF THE EXECUTIVE TO LAYOUT
>; THE PARTITIONS IN YOUR NEW SYSTEM.
>;
>* DO YOU HAVE THE MAP ALREADY? [Y/N]:N
>PIP LP:=SY0:[1,34]RSX11M.MAP
>;
>; LOOK IN THE MAP OF THE EXEC FOR THE SYMBOL $SYTOP WHICH
>; INDICATES THE LAST ADDRESS ALLOCATED TO THE EXEC. USER
>; PARTITIONS MAY START AT ANY LOCATION BEYOND THIS ADDRESS
>; AS LONG AS THEY FALL ON A 64 BYTE BOUNDARY. SEE THE
>; SYSGEN MANUAL FOR A DESCRIPTION OF HOW TO SET UP PARTITIONS.
>; YOU MAY WISH TO STOP AT THIS TIME TO LAYOUT YOUR PARTITIONS.
>;
>* DO YOU WANT TO CONTINUE AND BUILD THE TASKS NOW? [Y/N]:Y
>;
>; WE WILL NOW EDIT THE TASK BUILD COMMAND FILES
>; AND BUILD THE REQUIRED TASKS.
>;
>; MOST OF THE TASKS TO BE BUILT HAVE TASK BUILD
>; COMMAND FILES WHICH SPECIFY EITHER PARTITION
>; SYSPAR OR GEN. SYSPAR IS A PARTITION WHICH IS
>; ASSUMED TO BE 10000(8) BYTES LONG
>; GEN IS A PARTITION WHICH IS 40000(8) BYTES LONG
>;
>SET /UIC=[1,24]
>PIP LAINIT.OLB;*/DE,[200,200]BLDLAINIT.CMD;*
>;
>; IT IS POSSIBLE TO BUILD 3 VERSIONS OF THE FILE SYSTEM:
>; 1) 2K NON-MULTI-HEADER
>; 2) 2.5K MULTI-HEADER
>; 3) 5.5K FAST MULTI-HEADER
>; THE NON-MULTI-HEADER FILE SYSTEM RESTRICTS FILES TO A
>; MAXIMUM OF 26,112 BLOCKS OF 512 BYTES. THE MULTI-HEADER
>; FILE SYSTEMS DO NOT ENFORCE THIS RESTRICTION. IF YOU
>; ARE BUILDING A 16K SYSTEM, YOU MUST ALWAYS BUILD THE 2K
>; FCP. FOR SYSTEMS WITH RP02/03/04/05/06 DISKS IT IS
>; RECOMMENDED THAT YOU BUILD THE 5.5K FCP. BIGFCP IS

```

EXAMPLE SYSGEN

```

># STRUCTURED SO THAT IT STORES AS MANY FILE CONTROL BLOCKS
># (FCB'S) IN ITS TASK IMAGE AS POSSIBLE BEFORE OVERFLOWING
># INTO THE DYNAMIC STORAGE REGION. AS DISTRIBUTED, THE
># BUILD COMMAND FILE ALLOCATES SPACE FOR 24. FCB'S. YOU
># MAY CHANGE THIS LIMIT BY EDITING THE BUILD COMMAND FILE.
>#
>* DO YOU WISH TO BUILD THE BIG (5.5K) AND FASTER FILE SYSTEM? [Y/N]:Y
>PIP FCPNMH.OLB;*;FCPNMHRD.*;*/DE
>#
># BIGFCP'S BUILD FILE SELECTS PARTITION FCPPAR
># WHICH STARTS AT 0(8) AND IS
># 26000(8) LONG. IN MOST CASES, THESE LIMITS WILL
># HAVE TO BE ALTERED FOR YOUR SYSTEM.
>#
>* DO YOU HAVE TO EDIT THE 5.5K FCP TASK BUILD COMMAND FILE? [Y/N]:N
>#
># THE TASKS MCR, MCRMU, AND TKTN NORMALLY RUN IN PARTITION
># SYSPAR. IF YOU WISH TO CHANGE THE PARTITION NAME,
># PUT ANY OF THESE TASKS IN OTHER PARTITIONS,
># OR CHANGE THE LENGTH OF SYSPAR FROM 10000(8),
># YOU MUST EDIT THE TASK BUILD COMMAND FILES.
>#
># THERE ARE TWO VERSIONS OF MCR AVAILABLE -- A SINGLE USER
># VERSION AND A MULTI-USER VERSION. THE SINGLE USER MCR
># PROCESSES ALL COMMANDS SERIALY AND RUNS IN PARTITION
># SYSPAR. THE MULTI-USER VERSION CONSISTS OF TWO TASKS,
># MCRMU AND SYS. TASK MCRMU RECEIVES ALL COMMANDS IN
># THE NORMAL SERIAL MANNER, BUT IT PASSES MOST ON TO
># TASK SYS FOR PROCESSING. SINCE MULTIPLE COPIES OF
># SYS MAY BE RUNNING (ONE FOR EACH TERMINAL) A DEGREE
># OF PARALLELISM IS ACHIEVED. TASK MCRMU RUNS IN
># PARTITION SYSPAR WHILE TASK SYS RUNS IN GEN.
>#
>* DO YOU WANT TO BUILD THE MULTI-USER VERSION OF MCR? [Y/N]:Y
>PIP MCRBLD.*;*/DE
>* DO YOU HAVE TO EDIT THE TASK BUILD FILE FOR MCRMU AND SYS? [Y/N]:N
>* DO YOU HAVE TO EDIT THE TASK BUILD COMMAND FILE FOR TKTN? [Y/N]:N
>PIP F11MSGBLD.CMD;*;F11MSG.OLB;*;F11MSGBLD.ODL;*;*/DE
>PIP MTA.OLB;*;MTABLD.*;*/DE
>SET /UIC=[1,1]
>PIP FCSMTA.OBJ;*;*/DE
>SET /UIC=[1,24]
>#
># THE FOLLOWING TASKS PROCESS ADDITIONAL MCR COMMANDS:
># BOO, DMO, AT., INI, INS, LOA, MOU, SAV, UFD, AND UNL.
># THEIR TASK BUILD COMMAND FILES SPECIFY PARTITION GEN, WHICH IS
># 8K WORDS (OCTAL 40000 BYTES) LONG. IF YOU WISH TO CHANGE THE
># PARTITION IN WHICH ANY OF THEM RUN, YOU MUST EDIT THE
># APPROPRIATE BUILD FILE.
>#
>#
># IF THE ALTER-PRIORITY DIRECTIVE WAS NOT INCLUDED IN THE
># EXECUTIVE, YOU MUST EDIT THE COMMAND FILE FOR TASK AT.
>#
>* DO YOU HAVE TO EDIT ANY FILES FOR MCR TASKS? [Y/N]:N
>#
># THE TASKS HELLO AND BYE PROVIDE LOGIN/LOGOUT SUPPORT FOR
># MULTI-USER SYSTEMS. IF YOU SELECTED MULTI-USER PROTECTION
># SUPPORT DURING SYSGEN PART 1, YOU MUST BUILD HELLO AND BYE.
># THE ACCOUNT FILE MAINTENANCE PROGRAM ACNT MUST ALSO BE
># BUILT TO CREATE AND MAINTAIN THE PASSWORD FILE. IN
># ADDITION, TWO OPTIONAL UTILITY TASKS ARE AVAILABLE:
># BRO - BROADCAST MESSAGE TO TERMINALS
># SHUTUP - PERFORM ORDERLY SYSTEM SHUTDOWN
># ALL OF THE DISTRIBUTED COMMAND FILES SPECIFY THAT THE
># TASKS RUN IN PARTITION GEN.
>#
>* DO YOU WANT TO BUILD THE MULTI-USER PROTECTION TASKS? [Y/N]:Y

```

EXAMPLE SYSGEN

```
>* DO YOU WANT TO BUILD THE MULTI-USER UTILITIES? [Y/N]:Y
>
>; IF YOUR TARGET SYSTEM DOES NOT HAVE A LINE PRINTER, YOU MUST
>; EDIT THE BUILD FILE FOR ACNT TO REMOVE THE ASSIGNMENT TO LP:.
>;
>* DO YOU HAVE TO EDIT THE BUILD FILES FOR HELLO, BYE, AND ACNT? [Y/N]:N
>* DO YOU HAVE TO EDIT THE BUILD FILES FOR BRO AND SHUTUP? [Y/N]:N
>
>; THE TASKS ERL AND ERF SUPPORT ERROR LOGGING. ERL IS THE
>; ERROR LOGGER TASK, ERF TURNS ERROR LOGGING OFF. THEY MUST
>; BE BUILT IF YOU SELECTED ERROR LOGGING SUPPORT DURING SYSGEN
>; PART ONE. THE TASK BUILD COMMAND FILES BUILD BOTH TASKS TO
>; RUN IN PARTITION GEN.
>;
>; THE REMAINING ERROR LOGGING TASKS (PSE AND SYE) ARE NOT
>; PRIVILEGED AND THEREFORE ARE NOT BUILT DURING SYSGEN PART 2.
>; IF YOU WANT TO BUILD THESE TASKS, YOU MUST DO SO IN SYSGEN
>; PART 3.
>;
>* DO YOU WANT TO BUILD THE ERROR LOGGING TASKS? [Y/N]:Y
>* DO YOU HAVE TO EDIT THE BUILD FILES FOR ERL AND ERF? [Y/N]:N
>
>; THE TASK ACS ALLOCATES/DEALLOCATES THE CHECKPOINT FILE.
>; IF YOU SELECTED SUPPORT FOR DYNAMIC ALLOCATION OF
>; CHECKPOINT SPACE DURING SYSGEN PART 1, YOU MUST BUILD
>; THIS TASK. IT WILL BUILD TO RUN IN PARTITION GEN.
>;
>* DO YOU WANT TO BUILD TASK ACS? [Y/N]:Y
>* DO YOU HAVE TO EDIT TASK ACS'S BUILD COMMAND FILE? [Y/N]:N
>
>; TASK PMD IS THE POST-MORTEM AND SNAP DUMP PROCESSOR
>; IT IS A PRIVILEGED TASK AND FOR CORRECT OPERATION IT SHOULD
>; RUN IN A PARTITION WITH ONLY CHECKPOINTABLE TASKS.
>; THE TASK BUILD COMMAND FILE BUILDS THE TASK FOR PARTITION
>; PAR4K WHICH IS 20000(8) LONG
>;
>* DO YOU WANT TO BUILD TASK PMD? [Y/N]:N
>PIP PMD.OLB;*;PMDBLD.**/DE
>
>; TASK SHF IS THE SYSTEM CONTROLLED PARTITION TASK
>; COMPACTION ROUTINE. IT WILL AGGLOMERATE FREE SPACE
>; IN A SYSTEM CONTROLLED PARTITION ON REQUEST FROM
>; THE EXECUTIVE. YOU MUST HAVE SELECTED DYNAMIC MEMORY
>; ALLOCATION DURING SYSGEN PART 1 FOR THIS TASK TO BE
>; CALLED BY THE EXECUTIVE. IT NORMALLY RUNS IN PARTITION
>; SYSPAR. THE PARTITION IT RUNS IN MUST NOT BE SYSTEM
>; CONTROLLED.
>;
>* DO YOU WANT TO BUILD TASK SHF? [Y/N]:Y
>* DO YOU HAVE TO EDIT TASK SHF'S BUILD COMMAND FILE? [Y/N]:N
>
>; THE TASK RMDemo DISPLAYS SYSTEM STATUS ON A VT05 OR VT52.
>; IT DISPLAYS THE ACTIVE TASK, POOL STATUS, PARTITION
>; LAYOUT, AND TASKS RESIDENT IN MEMORY. IT WILL BUILD
>; FOR PARTITION GEN BUT ONLY REQUIRES 4K TO RUN AND
>; USES LUN1 AS THE DISPLAY DEVICE.
>;
>* DO YOU WANT TO BUILD TASK RMDemo? [Y/N]:Y
>* DO YOU WANT TO BUILD IT FOR A VT05? [Y/N]:N
>* DO YOU WANT TO BUILD IT FOR A VT52? [Y/N]:Y
>PIP RMD05.OBJ;*;RMD05BLD.CMD;**/DE
>* DO YOU HAVE TO EDIT TASK RMDemo'S BUILD COMMAND FILE? [Y/N]:N
>
>; THE PRINT SPOOLER IS NOT DISTRIBUTED AS A TASK IMAGE. IF YOU
>; WISH TO USE A PRINT SPOOLER IN YOUR TARGET SYSTEM, YOU MUST
>; EXPLICITLY BUILD IT. THE TASK BUILD COMMAND FILE
>; SPECIFIES PARTITION SPLPAR WHICH IS 10000(8) LONG
>;
```

EXAMPLE SYSGEN

```

>* DO YOU WANT TO BUILD TASK PRT (PRINT SPOOLER)? [Y/N]:Y
>
> THE DEFAULT PRINT SPOOLER WILL ONLY DELETE FILES NAMED
> LP.LST, LP.MAP, *.PMD, AND *.DMP. IF YOU WANT THE SPOOLER
> TO DELETE ALL FILES, YOU MUST EDIT THE BUILD COMMAND FILE.
>
>* DO YOU HAVE TO EDIT TASK PRT'S BUILD COMMAND FILE? [Y/N]:Y
>EDI PRTBLD.CMD
[00081 LINES READ IN]
[PAGE 1]
*L PAR
FAR=SPLPAR:0:10000
*C/SPLPAR/GEN
FAR=GEN:0:10000
*EX
[EXIT]

>
> NOW WE BUILD THE PRIVILEGED AND MCR TASKS.
>
>SET /UIC=[1,24]
>PIP *.CMD/PU
>* DO YOU WANT TO GENERATE THE MAPS FOR THE ABOVE TASKS? [Y/N]:N
>ASN NL:=MP:
>TKB @BOOBLD
>PIP BOO.OLB;*,BOOBLD.CMD;*/DE
>TKB @DMOBLD
>PIP DMOBLD.CMD;*/DE
>TKB @BIGFCPBLD
>PIP FCP.OLB;*,FCPBLD.CMD;*,BIGFCPBLD.*;*/DE
>TKB @INDBLD
>PIP IND.OLB;*,INDBLD.*;*/DE
>TKB @INIBLD
>PIP INIBLD.*;*/DE
>TKB @INSBLD
>PIP INS.OLB;*,INSBLD.*;*/DE
>TKB @MCRMUBLD
>PIP MCRMUBLD.*;*,SYSBLD.*;*/DE
>TKB @MOUBLD
>PIP MOU.OLB;*,INI.OLB;*,MOUBLD.*;*/DE
>TKB @SAVBLD
>PIP SAV.OLB;*,SAVBLD.*;*/DE
>TKB @TKNBLD
>PIP TKNBLD.CMD;*/DE
>TKB @UFDBLD
>PIP UFD.OLB;*,UFDBLD.CMD;*/DE
>TKB @LOABLD
>TKB @UNLBLD
>PIP LOABLD.CMD;*,UNLBLD;*,LOA.OLB;*/DE
>TKB @RMD52BLD
>PIP RMD52.OBJ;*,RMD52BLD.CMD;*/DE
>TKB @SHFBLD
>PIP SHUFL.OBJ;*,SHFBLD.CMD;*/DE
>TKB @PRTBLD
>PIP PRT.OLB;*,PRTBLD.ODL;*,PRTBLD.CMD;*/DE
>TKB @ACNTBLD
>PIP ACNTBLD.*;*/DE
>TKB @BYEBLD
>PIP BYEBLD.CMD;*/DE
>TKB @HELBLD
>PIP HELBLD.CMD;*/DE
>TKB @BROBLD
>PIP BROBLD.CMD;*/DE
>TKB @SHUTUPBLD
>PIP SHUTUPBLD.CMD;*/DE
>PIP MLTUSR.OLB;*/DE
>TKB @ACSBLD
>PIP ACSBLD.CMD;*/DE

```


EXAMPLE SYSGEN

```

>PIP MCR.OLB;*/DE,SYSR0T.OBJ;*
>TKB @ERFBLD
>TKB @ERLBLD
>PIP ERF.OBJ;*/DE,ERL.OLB;*
>PIP [200,200]/RE=RSXBLD.CMD,RSX11M.OLB
>PIP *.*;*/DE
>PIP [1,24]/RE=[200,200]RSXBLD.CMD,RSX11M.OLB
>* DO YOU WANT TO BUILD ANY LOADABLE DRIVERS NOW? [Y/N]:Y
>SET /UIC=[200,200]
>#
># YOU MAY NEED THE TASK BUILD MAPS FOR THE DRIVER(S) FOR
># YOUR PARTITION LAYOUT.
>#
>* DO YOU WANT THE MAPS? [Y/N]:N
>SET /UIC=[1,24]
>#
># WHEN ALL DRIVERS ARE BUILT, STRIKE CARRIAGE RETURN WHEN ASKED
># FOR DEVICE MNEMONIC.
>#
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: DT
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]DTRVBLD
>PIP [200,200]DTRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: DS
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]DSDRVBLD
>PIP [200,200]DSDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: DB ✓
>* WHAT IS THE DRIVER PARTITION NAME [S]: DV\V\RVPAR
>TKB @[200,200]DBDRVBLD
>PIP [200,200]DBDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: DK
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]DKDRVBLD
>PIP [200,200]DKDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: LP ✓
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]LPDRVBLD
>PIP [200,200]LPDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: DX
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]DXDRVBLD
>PIP [200,200]DXDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: DM
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]DMDRVBLD
>PIP [200,200]DMDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: MM ✓
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]MMDRVBLD
>PIP [200,200]MMDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]: TT ✓
>* WHAT IS THE DRIVER PARTITION NAME [S]: DRVPAR
>TKB @[200,200]TTDRVBLD
>PIP [200,200]TTDRVBLD.CMD;*/DE
>* WHAT IS THE DRIVER 2-CHARACTER DEVICE MNEMONIC [S]:
># BECAUSE UNLOAD WILL BE CONFUSED BY THE NEW LP DRIVER,
># WE WILL RENAME IT. BEFORE WE RUN VMR, WE WILL CHANGE
># IT BACK.
>SET /UIC=[1,54]
>PIP LPNEW.TSK/NV/RE=LPDRV.TSK
>PIP LPNEW.STB/NV/RE=LPDRV.STB
>#
># THE UTILITY TASKS (MAC, PIP, TKB ETC.) ARE ALREADY BUILT TO RUN IN
># PARTITION GEN (EXCEPT BIGMAC AND BIGTKB WHICH ARE BUILT TO RUN
># IN PAR14K). IF YOU WISH TO CHANGE THE PARTITION IN WHICH ANY OF THEM
># RUN YOU MUST EDIT THE APPROPRIATE TASK'S BUILD COMMAND FILE
># AND REBUILD THE TASK.

```

EXAMPLE SYSGEN

```

># NOTE: FOR MAPPED SYSTEMS IT ISN'T NECESSARY
># TO REBUILD ANY OF THESE TASKS SINCE YOU
># MAY EXPLICITLY SPECIFY THE PARTITION IN
># WHICH THEY RUN AT INSTALL TIME.
>#
># THE USER MODE DIAGNOSTICS ARE NOT DISTRIBUTED AS TASK IMAGES.
># IF YOU WANT THEM, YOU HAVE TO BUILD THEM.
>#
># IF YOU WANT TO REBUILD THE UTILITY OR DIAGNOSTIC TASKS
># AND THE SYSTEM YOU ARE GENERATING HAS AT LEAST 24K OF
># MEMORY AND IT WILL RUN THE DISTRIBUTED TASKS, IT IS
># SUGGESTED THAT YOU BUILD THEM USING YOUR SYSTEM DISK
># INSTEAD OF THE BASLINE DISK, AFTER SYSGEN2 IS COMPLETED.
># OTHERWISE, ANSWER YES TO THE FOLLOWING QUESTION.
>#
>* DO YOU WANT TO REBUILD UTILITIES AND/OR BUILD DIAGNOSTICS? [Y/N]:Y
>SET /UIC=[200,200]
>DMO DK0:
>#
>#
># REMOVE THE SYSTEM DISK FROM DK0: AND REPLACE IT WITH
># THE UTILOBJ DISK. START UP THE UTILOBJ DISK (WRITE ENABLED).
>#
>* IS THE UTILOBJ DISK READY? [Y/N]:Y
>MOU DK0:UTILOBJ
>* DO YOU WANT EXPANDED COMMENTS FOR SYSGEN PART 3? [Y/N]:N
>* DO YOU WANT TO REBUILD ANY UTILITY TASKS? [Y/N]:Y
>* DO YOU WANT TO BUILD ANY USER MODE DIAGNOSTICS? [Y/N]:Y
>* IS SYSLIB ALREADY CORRECT FROM A PREVIOUS RUN OF THIS FILE? [Y/N]:Y
>#
># NOTE THAT THE TASKS TEC, VTEC, RNO, AND SRD ARE NOT SUPPORTED
># PRODUCTS. THEY HAVE BEEN ADDED TO THE SYSGEN3 PROCEDURE FOR
># YOUR CONVENIENCE.
>#
>SET /UIC=[1,24]
>* DO YOU WANT TO BUILD TASK MAC? [Y/N]:
>* DO YOU WANT TO BUILD TASK BIGMAC? [Y/N]: ✓
>* DO YOU WANT TO BUILD TASK TKB? [Y/N]:
>* DO YOU WANT TO BUILD TASK BIGTKB? [Y/N]: ✓
>* DO YOU WANT TO BUILD TASK PIP? [Y/N]: ✓
>* DO YOU WANT TO BUILD TASK FLX? [Y/N]: ✓
>* DO YOU WANT TO BUILD TASK VFY? [Y/N]:
>* DO YOU WANT TO BUILD TASK DMP? [Y/N]:
>* DO YOU WANT TO BUILD TASK EDI? [Y/N]:
>* DO YOU WANT TO BUILD TASK SLP? [Y/N]:
>* DO YOU WANT TO BUILD TASK LBR? [Y/N]:
>* DO YOU WANT TO BUILD TASK TEC? [Y/N]:
>* DO YOU WANT TO BUILD TASK VTEC? [Y/N]:
>* DO YOU WANT TO BUILD TASK PSE? [Y/N]:Y ✓
>* DO YOU HAVE TO EDIT TASK PSE'S BUILD COMMAND FILE? [Y/N]:N
>* DO YOU WANT TO BUILD TASK SYE? [Y/N]:Y ✓
>* DO YOU HAVE TO EDIT TASK SYE'S BUILD COMMAND FILE? [Y/N]:N
>* DO YOU WANT TO BUILD TASK CRF? [Y/N]:
>* DO YOU WANT TO BUILD TASK ZAP? [Y/N]:
>* DO YOU WANT TO BUILD TASK BAD? [Y/N]:Y ✓
>* DO YOU HAVE TO EDIT TASK BAD'S BUILD COMMAND FILE? [Y/N]:N
>* DO YOU WANT TO BUILD TASK VMR? [Y/N]:
>* DO YOU WANT TO BUILD TASK RNO? [Y/N]:
>* DO YOU WANT TO BUILD TASK SRD? [Y/N]:
>* DO YOU WANT TO BUILD TASK FTB? [Y/N]:
>* DO YOU WANT TO BUILD TASK CMP? [Y/N]:
>* DO YOU WANT TO BUILD TASK PAT? [Y/N]:
>* DO YOU WANT TO BUILD TASK DSC? [Y/N]:
>* DO YOU WANT TO BUILD TASK CDA? [Y/N]:
>* DO YOU WANT TO BUILD TASK EDT? [Y/N]:
>* DO YOU WANT TO BUILD THE RMS UTILITIES? [Y/N]:
>* DO YOU WANT TO PRINT THE MAPS FOR THE UTILITY TASKS? [Y/N]:
^ASN NL:=MF:

```

EXAMPLE SYSGEN

```

>SET /UIC=[1,20]
>* DO YOU HAVE AN EMPTY RK05 REMOVABLE DRIVE AVAILABLE? [Y/N]:N
>TKB @[1,24]PSEBLD
>PIP DK1:[1,54]/NV=[1,54]PSE.TSK
>* WAS PSE COPIED SUCCESSFULLY? [Y/N]:Y
>PIP [1,54]PSE.TSK;0/DE
>TKB @[1,24]SYEBLD
>PIP DK1:[1,54]/NV=[1,54]SYE.TSK
>* WAS SYE COPIED SUCCESSFULLY? [Y/N]:Y
>PIP [1,54]SYE.TSK;0/DE
>TKB @[1,24]BADBLD
>PIP DK1:[1,54]/NV=[1,54]BAD.TSK
>* WAS BAD COPIED SUCCESSFULLY? [Y/N]:Y
>PIP [1,54]BAD.TSK;0/DE
>* DO YOU WANT EXPANDED COMMENTS FOR THE UMD BUILD PROCEDURE? [Y/N]:
>SET /UIC=[1,24]
> ; IF YOU HAVE THE DUAL RK05 RELEASE KIT, YOU SHOULD SPECIFY
> ; THAT THE DIAGNOSTICS BE STORED ON ANOTHER DISK. IF YOU HAVE
> ; A THIRD RK05 PUT THE SYSTEM DISK IN IT AND STORE THE DIAGNOSTICS
> ; ON IT. OTHERWISE STORE THEM ON LBO.
> ;
>* DO YOU WANT THE DIAGNOSTICS STORED ON ANOTHER DISK? [Y/N]:Y
>* ENTER THE OUTPUT DEVICE NAME AND UNIT NUMBER (E.G. DK1) [S]: LBO
> ;
> ; THE COMMAND BUILD FILE WILL NOW PAUSE WHILE YOU MOUNT LBO:
> ; YOU MUST CREATE THE UFD'S [1,34] AND [1,54] ON THE DISK
> ; (THE FORMER ONLY IF YOU WANT THE TASK BUILD MAPS) IF THEY
> ; DO NOT ALREADY EXIST.
> ;

```

```

AT. -- PAUSING. TO CONTINUE TYPE "RES ...AT."
RES ...AT.

```

```

AT. -- CONTINUING

```

```

>
>* DO YOU WANT TO ALTER THE DEFAULT PARTITION ATTRIBUTES? [Y/N]:N
>* ENTER THE BUFFER SIZE IN OCTAL BYTES (DEFAULT=2000) [S]:
>* DO YOU WANT TASK BUILD MAPS? [Y/N]:
>* DO YOU WANT TO BUILD ALL AVAILABLE DIAGNOSTICS? [Y/N]:
>* HAVE ALL QUESTIONS BEEN ANSWERED TO YOUR SATISFACTION? [Y/N]:Y
> ;
> ; ENTER THE NAME OF THE DIAGNOSTIC TASKS TO BUILD, ONE AT
> ; A TIME. WHEN DONE, ENTER A SINGLE CARRIAGE RETURN.
> ;
>* NAME [S]: RK05
>* NAME [S]:
> ;
> ; NOW WE TASK BUILD THE SELECTED DIAGNOSTICS
> ;
>TKB @UMDBLD
>SET /UIC=[1,54]
>DMD DK0:
> ;
> ;
> ; REMOVE THE UTILOBJ DISK FROM DK0: AND REPLACE IT WITH
> ; THE SYSTEM DISK.
> ;
>* IS THE SYSTEM DISK READY? [Y/N]:Y
>MDU DK0:SYSTEM
> ;
> ; WE WILL NOW COPY THE NEW TASKS TO THE SYSTEM DISK.
> ;
>PIP @LB:[200,200]COPYNEW
>PIP @LB:[200,200]COPYDIAG
>SET /UIC=[1,54]
> ;
> ; YOU NOW MUST SPECIFY WHETHER THE MEMORY SIZE WHICH YOU
> ; SPECIFIED FOR YOUR TARGET SYSTEM IN SGN DURING SYSGEN

```

EXAMPLE SYSGEN

```

># PHASE ONE IS GREATER THAN 32K WORDS.
>#
>* IS YOUR TARGET SYSTEM LARGER THAN 32K WORDS? [Y/N]:Y
>#
># IF YOU EVER WISH TO FIX TASKS ABOVE 32K OR LOAD DRIVERS
># ABOVE 32K AND SAVE THE SYSTEM OR IF THE TASK SAV
># (WHICH NORMALLY RUNS IN GEN) IS EVER TO BE RUN ABOVE
># 32K, YOU MUST CREATE A LARGER COPY OF YOUR TARGET SYSTEM
># WITH PIP AT THIS TIME.
>#
># NOTE: IT IS NOT POSSIBLE TO BOOT A VIRGIN MAPPED
># SYSTEM WHICH HAS DRIVERS LOADED ABOVE 27.5K FROM
># AN UNMAPPED SYSTEM. IT IS, HOWEVER, POSSIBLE TO
># BOOT A SAVED MAPPED SYSTEM WITH ANY CONFIGURATION
># FROM ANY UNMAPPED SYSTEM.
>#
>* DO YOU WISH TO CREATE A LARGER COPY OF YOUR SYSTEM? [Y/N]:Y
>#
># TO CREATE A SYSTEM IMAGE IN WHICH TASK IMAGES MAY BE FIXED UP
># TO M K WORDS, OR IN WHICH THE TOP OF SAV MAY BE AS HIGH
># AS M K WORDS, YOU MAY CALCULATE THE NUMBER OF BLOCKS (N)
># NEEDED AS FOLLOWS:
>#
>#     N=(4*M)+2
>#
># FOR EXAMPLE A 40K SYSTEM WOULD USE (40.*4)+2=162. BLOCKS
>#
># NOTE: SAVED IMAGES ON THE 11/70 ARE CURRENTLY
># SUPPORTED ONLY TO A MAXIMUM OF 124K WORDS
># (I.E. N=498.). ALSO, THE NUMBER OF BLOCKS
># IS ASSUMED TO BE OCTAL. TO SPECIFY A
># DECIMAL NUMBER, APPEND A TRAILING DECIMAL POINT.
>#
># FOR SINGLE RK05 DISTRIBUTION KITS, THE
># MAXIMUM SYSTEM IMAGE SIZE IS 64K (258.
># BLOCKS) DUE TO A LACK OF CONTIGUOUS SPACE.
>#
>* ENTER THE NUMBER OF BLOCKS FOR YOUR SYSTEM IMAGE FILE [S]: 498.
>PIP RSX11M.SYS/CO/NV/BL:498.=RSX11M.TSK
>SET /UIC=[1,54]
>#
># RSX11M.TSK IS A BACKUP COPY OF THE EXECUTIVE YOU JUST BUILT.
># IF YOU DO NOT WISH TO RETAIN IT, WE WILL DELETE IT NOW.
>#
>* DO YOU WISH TO DELETE THE SYSTEM BACKUP FILE RSX11M.TSK? [Y/N]:Y\Y
>#
># YOUR TARGET SYSTEM IS NOW READY TO SET UP PARTITIONS AND INSTALL
># THE REQUIRED TASKS. THE PROCEDURE TO FOLLOW ONCE VIRTUAL MCR
># IS RUNNING IS:
>#
># 1) EXTEND POOL SPACE TO BASE OF FIRST PARTITION
># 2) SET UP YOUR PARTITIONS
># 3) INVOKE THE INDIRECT FILE INSTALL.CMD IN VMR TO
># INSTALL THE PRIVILEGED TASKS YOU JUST BUILT
># 4) LOAD ANY LOADABLE DRIVERS THAT YOU WANT RESIDENT
># IN THE SYSTEM IMAGE. IF THE TERMINAL AND/OR SYSTEM
># DISK DRIVERS ARE LOADABLE, THEY MUST BE LOADED USING
># VMR.
># 5) EXIT FROM VIRTUAL MCR AND BOOT IN YOUR TARGET SYSTEM
>#
>#
># SET UP THE TARGET SYSTEM BASED ON THE FOLLOWING EXAMPLE.
>#
># >RUN $VMR;-1 ! RUN VIRTUAL MCR
># ENTER FILENAME:RSX11M.SYS ! VMR PROMPTS FOR FILE NAME
># VMR>SET /POOL=340 ! EXTEND POOL TO FIRST PAR. BASE
># VMR>SET /MAIN=DRVPAR:340:40:TASK ! SET UP DRIVER PAR.
># VMR>SET /MAIN=PAR14K:400:700:TASK ! SET UP 14K PARTITION

```

EXAMPLE SYSGEN

```

> VMR>SET /SUB=PAR14K:GEN:400:400 ! SET UP 8K PARTITION
> VMR>SET /MAIN=SYSPAR:1300:100:TASK ! SET UP SYSTEM PARTITION
> VMR>LOA DT: ! LOAD DECTAPE DRIVER
> VMR>@[200,200]INSTALL
> VMR>^Z ! EXIT FROM VIRTUAL MCR

```

```

> END OF VMR EXAMPLE

```

```

> THE FILE [200,200]INSTALL.CMD CONTAINS COMMANDS
> TO INSTALL ALL THE PRIVILEGED TASKS THAT YOU BUILT
> IN YOUR TARGET SYSTEM.
> YOU MAY WISH TO EDIT INSTALL.CMD TO INCLUDE OTHER TASKS.
> NOTE - IF YOU INSTALL A TASK
> WITH VMR THAT WAS NOT BUILT DURING
> THIS SYSGEN, YOU CANNOT RUN THAT TASK
> IN THE CURRENT SYSTEM!
> THIS IS TRUE FOR BOTH MAPPED AND UNMAPPED
> TARGET SYSTEMS, AND FOR BOTH PRIVILEGED
> AND NON-PRIVILEGED TASKS. THEREFORE,
> BOOT THE NEW SYSTEM IMMEDIATELY
> AFTER SYSGEN HAS FINISHED, OR AVOID
> INSTALLING TASKS WITH VMR THAT WERE
> NOT BUILT DURING THIS SYSGEN.

```

```

>* DO YOU WANT TO EDIT INSTALL.CMD? [Y/N]:N

```

```

>PIP LPDRV.TSK/RE/NV=LPNEW.TSK

```

```

>PIP LPDRV.STB/RE/NV=LPNEW.STB

```

```

> NOW WE WILL RUN VIRTUAL MCR SO THAT YOU MAY INITIALIZE
> YOUR SYSTEM.

```

```

>ASN SY:=LB:

```

```

>VMR

```

```

ENTER FILENAME: RSX11M

```

```

VMR>SET /POOL=700

```

```

VMR>SET /MAIN=DRVPAR:700:260:SYS

```

```

VMR>SET /MAIN=SYSPAR:1160:100:TASK

```

```

VMR>SET /MAIN=FCPPAR:1260:260:TASK

```

```

VMR>SET /MAIN=GEN:1540:3000:SYS

```

```

VMR>PAR

```

```

LDR 000000 000000 MAIN TASK

```

```

DRVPAR 070000 026000 MAIN SYS

```

```

SYSPAR 116000 010000 MAIN TASK

```

```

FCPPAR 126000 026000 MAIN TASK

```

```

GEN 154000 300000 MAIN SYS

```

```

VMR>LOA DB:

```

```

VMR>LOA DK:

```

```

VMR>LOA TT:

```

```

VMR>@[200,200]INSTALL

```

```

VMR>PAR

```

```

LDR 000000 000000 MAIN TASK

```

```

DRVPAR 070000 026000 MAIN SYS

```

```

070000 002000 SUB DRIVER - DB:

```

```

072000 001000 SUB DRIVER - DK:

```

```

073000 010100 SUB DRIVER - TT:

```

```

SYSPAR 116000 010000 MAIN TASK

```

```

FCPPAR 126000 026000 MAIN TASK

```

```

GEN 154000 300000 MAIN SYS

```

```

VMR>TAS

```

```

. LDR. LDR 248. 000000 LB0:-00000000 FIXED

```

```

TKTN 03.7 SYSPAR 248. 010000 LB0:-00001342

```

```

...DMO 03.1 GEN 160. 040000 LB0:-00001331

```

```

...MCR 02 SYSPAR 160. 010000 LB0:-00003624

```

```

...MOU 03.02 GEN 160. 040000 LB0:-00003402

```

```

...SYS 01 GEN 160. 010000 LB0:-00007506

```

EXAMPLE SYSGEN

```
F11ACP M0235 FCPPAR 149. 026000 LB0:-00004532
SHF... 03 SYSPAR 105. 010000 LB0:-00003330
...INI 03 GEN 100. 040000 LB0:-00003450
...INS 03 GEN 100. 040000 LB0:-00003505
...SAV 03.9 GEN 100. 040000 LB0:-00003706
...UFD V0407 GEN 100. 040000 LB0:-00003277
...AT. 04.17 GEN 65. 040000 LB0:-00007412
...ERF 01 GEN 61. 040000 LB0:-00001324
...ACS 01 GEN 50. 040000 LB0:-00003364
...BOO 03.2 GEN 50. 040000 LB0:-00003570
ERRLOG 01 GEN 50. 040000 LB0:-00004110
...LOA 03 GEN 50. 040000 LB0:-00003737
...UNL 02 GEN 50. 040000 LB0:-00003540
VMR>^Z
```

```
>#
># WHEN THE INDIRECT FILE EXITS, BOOT IN YOUR TARGET SYSTEM,
># SET THE DATE AND TIME, AND SAVE THE SYSTEM WITH A BOOTSTRAP.
># WHEN YOUR SYSTEM REBOOTS ITSELF, PURGE THE OLD TASK FILES.
>#
># E.G.
># >BOO RSX11M
>#
># RSX11M V03.1 BL22
># >TIM 12:00:00 1-JAN-78
># >SAV /WB
>#
># RSX11M V03.1 BL22 64K MAPPED
># >RED DKO:=SY:
># >RED DKO:=LB:
># >MOU DKO:SYSTEM
># >@[1,2]STARTUP
># >* PLEASE ENTER TIME AND DATE (HR:MN DD-MMM-YY) [S]:
># >TIM 12:01 1-JAN-78
># >@ <EOF>
># >SET /UIC=[1,54]
># >RUN $PIP
># PIP>*.*/PU
># PIP>^Z
>#
>#
># DON'T FORGET TO CREATE ACCOUNTS AFTER SAVING YOUR SYSTEM
>#
># <EOF>
>#
>
```

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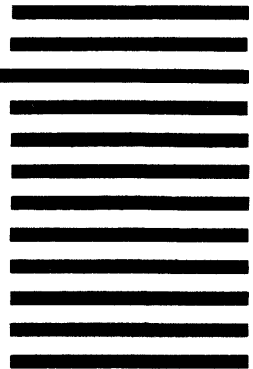
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