

**TOPS-10
Software Installation Guide**

AA-P512C-TB

October 1988

The *TOPS-10 Software Installation Guide* provides the site administrator, system manager, system programmer, or software specialist with the information required to install the TOPS-10 software on KL and KS processors.

Operating System: TOPS-10 Version 7.04

Software: GALAXY Version 5.1

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PREFACE

This manual describes how to install, upgrade, customize, and start the TOPS-10 operating system. It includes procedures for loading the default monitor, copying the programs from the distribution tapes to disk, building the monitor, starting the operating system, and creating the bootstrap tape. The procedures for installing, customizing, and starting the GALAXY batch and spooling system are also included, as well as descriptions of the various system files needed for timesharing on the TOPS-10 system. The procedures are described and explained in a step-by-step method.

The TOPS-10 Software Installation Guide may also be used in the following situations to:

- o Start the system after a shutdown or failure.
- o Change the monitor configuration.
- o Install a new version of the monitor or GALAXY subsystem.
- o Change disk parameters.

This manual is intended for experienced TOPS-10 software maintainers who are familiar with TOPS-10 conventions for commands and symbols. You should be able to operate the hardware components of the system being installed. For example, instructions for mounting software media (tapes and disks) are not documented in this manual because those procedures are documented in the TOPS-10 Operator's Guide and the TOPS-10/TOPS-20 Operator's Hardware Device and Maintenance Manual. The following manuals are also valuable sources of information for additional reference:

TOPS-10/TOPS-20 Batch Reference Manual

This manual provides information about writing and submitting batch control files to the GALAXY batch processor.

TOPS-10 Operating System Commands Manual

This manual provides information about monitor commands and conventions.

TOPS-10 Operator's Command Language Reference Manual

This manual provides information about the OPR program and operator-privileged commands.

TOPS-10 MACRO Reference Manual

This manual provides information required for making changes to program source code.

TOPS-10 LINK Reference Manual

This manual provides information about TOPS-10's linking loader, its switches, commands, and functions. LINK is used to build the monitor after the software configuration has been specified.

TOPS-10 Monitor Calls Manual

This manual provides in-depth information about monitor calls and monitor symbols that you may wish to modify in the monitor sources.

TOPS-10/TOPS-20 RSX-20F System Reference Manual

This manual provides information about the KL system's front-end processor. Of particular importance are references to the KLINIT dialogue and the PARSER commands.

TOPS-10/20 USAGE File Specification

This manual provides information about the formats of the files created by the USAGE accounting system.

TOPS-10 ANF-10 Software Installation Guide

This manual provides information for building ANF-10 remote nodes.

The procedures for installing a TOPS-10 system vary greatly between the first-time, new installation of a system, and the installation of a new version of the monitor on a system that has been running TOPS-10. This manual is organized into separate parts to address the specific needs of each case.

Part 1, "Getting Started", is made up of two chapters that explain how to use the manual. Chapter 1 contains introductory material which will help you find the procedures that apply to your installation. Chapter 2 contains worksheets that are useful when building the TOPS-10 monitor. DIGITAL Field Service personnel can help you fill out the hardware worksheet (Worksheet 1). As system manager you must provide the information for the software worksheet (Worksheet 2) and for the disk parameters worksheet (Worksheet 3). Questions about software considerations can be answered by a DIGITAL Software Specialist.

Part 2, "Preparing the System", is made up of four chapters that describe the procedures TOPS-10 installers must complete before building the monitor on a new installation.

Part 3, "Upgrading the System", is made up of two chapters that describe the procedures TOPS-10 installers must complete before upgrading the monitor on an existing system.

Part 4, "Building the Monitor and Tailoring the System", is made up of four chapters that describe how to build your monitor and tailor it to the particular needs of your site. This part applies to both upgrades and new installations.

Part 5, "Supplementary Information", is made up of appendixes that document alternatives to the installation procedure and information for modifying the monitor software.

PART 1: GETTING STARTED

This part is made up of two chapters which explain how to use this manual. Chapter 1 contains introductory material which will help you find the procedures that apply to the installation you are responsible for. Chapter 2 contains worksheets that are useful when building the TOPS-10 monitor.

CHAPTER 1
INTRODUCTION

Before you install the system, read the cover letter distributed with the software package, and the BEWARE file (MONITR.BWR) that is included on the Monitor/ANF-10 tape. They contain information about last minute changes to installation procedures that could not be included in this manual.

This manual uses the following conventions to denote the different procedures for KL and KS systems:

- o Sections appropriate to only one type of processor include the processor type in the title.
- o Within sections, specific references are made in the text to each type of processor.

1.1 READING PATH FOR NEW INSTALLATIONS

The new system is assumed to have no data on the formatted disks. Therefore, you must initialize the system and the system files. To install the new system, first read and follow all of the instructions in Part 1, Chapters 1 and 2. Then, read and follow all of the instructions in each chapter of Part 2 that are appropriate for the type of processor (KL or KS) that you are installing. Next, go on to Part 4 and follow the procedures necessary to build your monitor and tailor it to the needs of your particular site. Below is a summary of the chapters in Parts 1, 2, and 4 that are appropriate for a new installation.

PART 1: GETTING STARTED

Chapter 1: INTRODUCTION

This chapter helps you find the procedures that apply to the installation you are currently responsible for.

Chapter 2: PREPARATION

Chapter 2 describes how to check the hardware to be sure that it was installed properly and is ready for software installation. It contains worksheets to help you prepare the information that you will need during installation.

INTRODUCTION

PART 2: PREPARING THE SYSTEM

Chapter 3: BOOTING THE SYSTEM

This chapter describes how to load the bootstrap monitor from tape and boot the system. For KL systems, this chapter describes booting the front-end processor as well. With this initial system, you can build the TOPS-10 monitor.

Chapter 4: STARTING THE MONITOR

This chapter describes the ONCE dialogue, and describes how to start the bootstrap monitor on a new installation.

Chapter 5: BUILDING THE MONITOR FILE SYSTEM

This chapter describes how to copy the monitor sources, CUSPs, GALAXY system, and unbundled software from the distribution tapes into disk areas that you prepare for this purpose. It also describes the system's administrative control files and program initialization files.

Chapter 6: BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

This chapter describes how to copy the front-end processor (for KL systems) or the microprocessor (for KS systems) from the distribution media to disk, and how to boot the front-end from disk with the new software.

PART 4: BUILDING THE MONITOR AND TAILORING THE SYSTEM

Chapter 9: BUILDING THE MONITOR

This chapter describes how to tailor the TOPS-10 monitor using MONGEN. MONGEN is used to create new monitor configuration files. You can assemble and load the new software, and reload the system to start the new version of the monitor.

Chapter 10: STARTING AND TAILORING THE GALAXY SYSTEM

This chapter describes how to start up the GALAXY spoolers and servers, how to tailor the GALAXY batch and spooling system to the particular needs of the installation, and how to assemble and load the new GALAXY system.

Chapter 11: MAINTAINING THE SYSTEM AUTHORIZATION FILES

This chapter describes how to use the REACT program to create the system accounting files. The system accounting files specify PPNs and disk usage authorization for users.

Chapter 12: CREATING SYSTEM INITIALIZATION FILES

This chapter describes the INITIA program, and how to use INITIA to start up TOPS-10 system components automatically when the system is reloaded.

INTRODUCTION

1.2 READING PATH FOR EXISTING INSTALLATIONS

If you are installing a new version of the monitor on a system that has been running TOPS-10, you will probably use disks with system information on them. You need not create system accounting or initialization files and you will not need to boot the bootstrap monitor from tape. However, it is necessary to restore files from tape exactly as documented in these procedures.

Before building a new monitor for the existing installation, you should save the existing monitor sources, CUSPs, GALAXY components, and (for KL systems) front-end file system on a backup disk or tape. This will allow you to fall back to your old monitor if the new monitor is difficult to install or run.

To install the new monitor, first read and follow all of the instructions in Part 1, Chapters 1 and 2. Then, read and follow all of the instructions in each chapter of Part 3 that are appropriate for the type of processor (KL or KS) that you have. Next, go on to Part 4 and follow the procedures necessary to build your monitor and tailor it to the needs of your particular site. Below is a summary of the chapters in Parts 1, 3, and 4 that are appropriate for a system upgrade.

PART 1: GETTING STARTED

Chapter 1: INTRODUCTION

This chapter helps you find the procedures that apply to the installation you are currently responsible for.

Chapter 2: PREPARATION

Preparation for building the monitor is very important. Chapter 2 contains worksheets to help you prepare the information that you will need during installation. Experienced installers will find the checklists and worksheets in this chapter useful.

PART 3: UPGRADING THE SYSTEM

Chapter 7: BUILDING THE MONITOR FILE SYSTEM

This chapter describes how to restore the monitor, CUSPs, and unbundled software from the distribution tapes, and how to copy them into the appropriate disk areas.

Chapter 8: RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

This chapter describes how to build the front-end file system and reload the front-end (KL systems only) and how to create the microprocessor file system (KS systems only).

PART 4: BUILDING THE MONITOR AND TAILORING THE SYSTEM

Chapter 9: BUILDING YOUR MONITOR

This chapter describes how to tailor the TOPS-10 monitor using MONGEN. MONGEN is used to create new monitor configuration files. You can assemble and load the new software, and reload the system to start the new version of the monitor.

INTRODUCTION

Chapter 10: STARTING AND TAILORING THE GALAXY SYSTEM

This chapter describes how to start up the GALAXY spoolers and servers, how to tailor the GALAXY batch and spooling system to the particular needs of the installation, and how to assemble and load the new GALAXY system.

Chapter 11: MAINTAINING THE SYSTEM AUTHORIZATION FILES

This chapter describes how to use the REACT program to create the system accounting files. The system accounting files specify PPNs and disk usage authorization for users.

Chapter 12: CREATING SYSTEM INITIALIZATION FILES

This chapter describes the INITIA program, and how to use INITIA to start up TOPS-10 system components automatically when the system is reloaded.

1.3 SUPPLEMENTARY INFORMATION

Supplementary information is provided in Part 5. This consists of four appendixes and a glossary. The appendixes contain alternatives to the installation procedure, information for modifying the monitor software. The appendixes are summarized below:

Appendix A: ONCE STARTUP OPTIONS

This appendix describes the options to the ONCE program that define disk characteristics and start up the monitor.

Appendix B: MODIFYING THE MONITOR

This appendix describes how to modify the monitor, build the monitor library file by hand, and generate a monitor that is not completely supported by Digital Equipment Corporation. It also contains brief descriptions of the relevant symbols, source modules, and symbol files.

Appendix C: SETTING SCHEDULER PARAMETERS

This appendix explains how to use the SCDSET program to set system usage quotas, adjust scheduler parameters, update the class of all logged in jobs, and manipulate a SCDMAP.SYS file.

Appendix D: CREATING BOOTABLE FRONT-END MEDIA

This appendix describes the procedure for making the front-end media bootable for RSX-20F.

Glossary

The glossary lists and defines the specialized terms used in this manual.

CHAPTER 2

PREPARATION

This chapter explains the steps and precautions to take before you install the monitor on a new system or upgrade your existing monitor.

If you are installing a new system, a DIGITAL Field Service Representative will install the hardware components of your system and will run diagnostics to ensure that the hardware functions properly.

The materials you need to install a new system or upgrade an existing system are:

- o A supported hardware configuration. See Section 2.3.

To ensure that you have the hardware information that you need to install the system, prepare Worksheet 1 in this chapter. If you are installing a new system, the hardware characteristics should be listed for you by the Field Service Representative.

- o A disk unit with plenty of free space.

At least 100,000 disk blocks are required for a system upgrade. A newly formatted disk is required for a new installation.

- o Software distribution media: magnetic tapes, DECTapes, and floppy diskettes.

Each type of processor requires software that is distributed on a different set of media. The distribution package is described in the following sections.

- o A list of software components and options.

Use Worksheet 2 in this chapter to record this information.

- o A list of disk parameters and search lists.

Use Worksheet 3 in this chapter to record this information.

- o System accounting files to record user accounts and access privileges.

You can create these with the REACT program. REACT is described in Chapter 11.

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- o A SYSJOB.INI file and/or OPR.ATO file to use for automatic system startup.

Chapter 12 explains how to create a SYSJOB.INI file. An OPR.ATO file can also be used, to automatically load and reload a communications front-end by inclusion of the appropriate commands. For information on the OPR.ATO file, see the TOPS-10 Operator's Guide.

2.1 TOPS-10 SYSTEM INSTALLATION MATERIALS

The following magnetic tapes are provided in the software distribution package:

- o The TOPS-10 Monitor/ANF-10 Tape

This magnetic tape contains the bundled monitor and ANF-10 software for TOPS-10. The tape is written at 1600 bits-per-inch density (BPI) by the BACKUP program. It contains the following:

- Monitor source files
- MONITR.BWR file, which contains information about last minute changes to installation procedures that could not be included in this manual.
- ANF-10 network files
- DECnet-10 network files

- o The TOPS-10 CUSP Tapes

"CUSP" stands for "Commonly Used System Program". A CUSP is a system program that provides important functions for the monitor and the user. These tapes contain the latest versions of all of the TOPS-10 monitor CUSPs and the files for the GALAXY batch and spooling system. The tapes are written at 1600 BPI by the BACKUP program. The first CUSP tape contains a file named CUSP.BWR, which describes changes to the programs on the CUSP tape.

- o The Customer-Supported Tape

This tape contains files that are supported by the customer base, not by DIGITAL. This tape is also written at 1600 BPI. It contains the following types of files:

- customer-supported CUSP files
- customer-supported monitor modules

- o The Unsupported Tools Tape

This tape contains files that can be used for various purposes, as supplied. The tools are provided "as is", and are not supported.

PREPARATION

- o The Bootable Tape

This tape contains the TOPS-10 bootstrap monitor and related programs. The bootable tape is provided to allow you to start a standard operating system used to build a customized monitor. The tape is written at 1600 BPI by the BACKUP program.

- o Unbundled Software Tapes

For each unbundled software product, magnetic tape(s) contain the software necessary for running the software. Note that unbundled options may require installation instructions that are not included in this manual because the product contains its own installation manual.

2.2 KL FRONT-END INSTALLATION MATERIALS

The KL processor installation is also supplied with software for the RSX-20F front-end. The front-end software is distributed on different types of media, depending upon the type of system. A KL10-D (DECsystem-1090) front-end requires three DECTapes, labeled DT-A, DT-B, and DT-C. A KL10-E (DECsystem-1091) front-end requires three floppy diskettes, labeled FLP-A, FLP-B, and FLP-C.

2.3 REQUIRED HARDWARE CONFIGURATIONS

The bootstrap monitor for TOPS-10 requires a minimal set of peripheral hardware. The required configurations are different for the KL and KS systems, and are specified below.

2.3.1 KL Hardware

For a KL processor, the minimally required configuration of peripherals for the bootstrap monitor is:

- o One RH20 for disk, dual-ported between the front-end and KL processor
- o One RH20 for tape
- o CTY (console terminal)

2.3.2 KS Hardware

For a KS processor, the minimally required configuration of peripherals for the bootstrap monitor is:

- o One RH11 (UBA#1) for disk
- o One RH11 (UBA#3) for tape
- o CTY (console terminal)

PREPARATION

If you are installing a new system and have all the materials available to begin installation, you are now ready to power up the system; continue reading this chapter. If you are installing a new version of the monitor on an existing system, go to Section 2.5.

2.4 POWERING UP THE SYSTEM

Before powering up the system, perform the following steps:

- o For KL systems only, set the port controller select switch on the disk drive that is dual-ported between the KL10 and the front-end to the A/B position.
- o Power up the disk drives.
- o Power up the magnetic tape drives.
- o Power up the line printers.
- o Turn on the CTY(s). Make sure each is loaded with paper and is on-line. Check the terminal setting for line speed. An LA36 terminal must be set to 300 baud. For an LA120, ask the Field Service Representative what the baud rate should be.

If a line printer, disk drive, or magtape drive is not powered up, refer to the TOPS-10/TOPS-20 Operator's Hardware Device and Maintenance Manual for powering-up procedures.

2.4.1 Powering up the KL10

To power up the KL10, press the black switch on the upper control panel to the position labeled POWER ON. When the system is powered up, the light labeled POWER is lit. If you have never powered up the system, refer to the TOPS-10 Operator's Guide for detailed instructions.

2.4.2 Powering up the KS10

To power up the KS10, press the button labeled POWER. When the system is powered up, the light labeled POWER is lit. This usually takes a few seconds. 15 seconds after the power light comes on, the system will try to load the microcode from the disk on drive 0. The message BT AUTO will be printed on the CTY to indicate that this operation is in progress. Because the microcode is not on the disk, repeated attempts to load the microcode will be unsuccessful and the CTY will continue to print BT AUTO every 15 seconds. Enter CTRL/C on the CTY to stop the process of searching for the microcode on disk. When you enter CTRL/C, the prompt KS10> will be printed on the CTY. Chapter 3 describes how to load microcode from tape.

Now that you have powered up the system, you can boot it as described in Chapter 3. But first, prepare the information you will need by following the instructions in the next section.

PREPARATION

2.5 PREPARING INFORMATION

It is important to prepare the information that you will need during installation. Because this information is lengthy, and may come from several sources, worksheets are provided to record the information. Use the completed worksheets as reference during installation and to keep a record of the characteristics of the system.

2.5.1 Worksheet 1

If you are installing a new system, a Field Service Representative can provide you with the information for Worksheet 1, Hardware Configuration.

2.5.2 Worksheet 2

Use Worksheet 2 to record the software configuration. The software configuration is largely the responsibility of the system manager. Information to make the necessary decisions is provided in this manual and in other documents in the TOPS-10 Software Notebook Set. Questions should be directed to a DIGITAL Software Specialist.

2.5.3 Worksheet 3

Use Worksheet 3 to record disk characteristics. The disk system must be defined for the monitor. This is accomplished when you select the DEFINE startup option for the ONCE dialogue (see Appendix A).

PREPARATION

Worksheet 1

Hardware Worksheet

System name (24 characters maximum): _____

CPU type (KL or KS): _____

Number of CPUs (KL only): _____

CPU Serial Numbers

CPU0: _____

CPU1: _____

CPU2: _____

Total amount of system memory (KS 512K): _____

(KL 768K): _____

Clock ticks (60,50): _____

System Devices

Answer YES or NO to the following questions.

Does the system have any of the following:

One or more CI-20 (SCA) subsystem interfaces? _____

One or more NI-20 (Ethernet) subsystem interfaces? _____

RP01/2/3 disks? _____

Swapping drums? _____

RS04/05 fixed-head disks? _____

Any DX20/RP20 disk subsystems? _____

CI-based disks (RA60/RA81)? _____

Are any of the following kinds of magtape drives present:

TM02/TM03 controller-based drives (TU45/TU77s)? _____

DX10/TX01/TX02-based drives (TU70/71/72s)? _____

DX20/TX02-based drives (TU70/71/72s)? _____

TM78 controller-based (TU78/79s)? _____

TM10B controller-based (TU40/41s)? _____

TM10C controller-based (TU43)? _____

PREPARATION

Does the system have any of the following devices:

Line printers connected to the I/O Bus? _____

Line printers connected to the Console Front-End? _____

XY10 I/O bus plotters? _____

CR10 I/O bus card readers? _____

CD20 CFE-based card readers? _____

CP10/CP10D I/O bus card punches? _____

Paper-tape punches? _____

Paper-tape readers? _____

Front-Ends

Will any front-ends be running: ANF-10? _____

DN60 IBMCOMM? _____

DECnet-10? _____

How many terminal lines are there on CPU0? _____

CPU1? _____

CPU2? _____

CPU3? _____

CPU4? _____

TTY number for OPR (usually CTY)? _____

Which lines on your system are dataset lines? _____

PREPARATION

Worksheet 2

Software Worksheet

Maximum number of jobs: _____

Maximum amount of memory per job: _____

Allow locking jobs? (Y or N): _____

Minimum amount of memory for unlocked jobs: _____

Number of real-time devices: _____

Number of HPQs: _____

Number of PTYs: _____

Monitor Services

Answer YES or NO to the following questions about user runtime accounting:

Exclude monitor overhead? _____

Use EBOX/MBOX clocks? (KL only) _____

Include PI time? (KL only) _____

Account verification? _____

Include MSGSER? _____ PSISER? _____

IPCF? _____ ENQ/DEQ? _____

PREPARATION

Worksheet 3

Disk Parameters Worksheet

For each file structure, note the following:

Structure Name (DSKB)	_____	_____	_____	_____	_____
Units in Structure (RPA0, RPA1)	_____	_____	_____	_____	_____
Consecutive blocks tried on output	_____	_____	_____	_____	_____
Overdraw blocks allowed per user	_____	_____	_____	_____	_____
Private structure?	_____	_____	_____	_____	_____
Owner PPN	_____	_____	_____	_____	_____
Amount of space for crash file	_____K	_____K	_____K	_____K	_____K
Blocks per cluster	_____	_____	_____	_____	_____
Bits per cluster count	_____	_____	_____	_____	_____

Units

For each unit, note the following:

Unit Name	_____	_____	_____	_____	_____
Unit-id	_____	_____	_____	_____	_____
SAT Blocks	_____	_____	_____	_____	_____
SAT Blocks in Core	_____	_____	_____	_____	_____
Swap Space	_____K	_____K	_____K	_____K	_____K

PART 2: PREPARING THE SYSTEM

This part is made up of four chapters that describe the preparatory procedures that must be accomplished before building the monitor and tailoring the system. If you are upgrading an existing system, you should go to Part 3, Chapter 7, now.

CHAPTER 3

BOOTING THE SYSTEM

This chapter describes how to load the bootstrap monitor from tape and how to boot the system. The procedure for booting a KL system is described in Section 3.1. The procedure for booting a KS system is described in Section 3.2.

3.1 BOOTING THE KL SYSTEM

Before booting the KL system, you must mount the required media on the drives, load the front-end, initialize the front-end, and load the bootstrap monitor. If you are unfamiliar with the procedure for mounting software media, refer to the TOPS-10/20 Operator's Hardware Device and Maintenance Manual for instructions on mounting DECTapes, floppy diskettes, disk packs, and magtapes.

The monitor, supporting CUSPS, and unbundled software are distributed on magnetic tape. The front-end software is distributed on DECTapes or floppy diskettes. Perform the following steps to mount the distribution media and load the front-end:

Step	Explanation
1. Mount distribution media	
For DECTapes:	Mount the DECTape labeled DT-A on Drive 0. Mount the DECTape labeled DT-B on Drive 1.
For floppy diskettes:	Mount the floppy labeled FLP-A in the left-hand drive unit, DX0:. Mount the floppy labeled FLP-B in the right-hand drive unit, DX1:.
Magnetic tape:	Check to see if there is a write ring in the reel, and remove it before mounting the bootable tape on Drive 0.
Disk pack:	You must also mount a disk pack that the system can access. Mount a properly formatted disk pack on Rpmx, where 'm' is the disk unit's controller letter and 'x' is the unit number. The drive must be dual-ported between the front-end and the KL processor. The drive RPA0 is used throughout this manual.

BOOTING THE SYSTEM

2. Set the data switches on the front-end control panel to 000007. To do this, raise the switches marked 0, 1, and 2 on the switch register to the up position. The data switches are off when down, on when up.
3. Check control switches The control switches to the right of the data switches should all be raised. This data switch setting causes the front-end to run the CPU initialization dialogue (KLINIT) for loading and configuring CPU memory.
4. Hold the ENABLE switch on, press the SW/REG switch, then release both. When you press these switches, the front-end software is loaded from DECTape or floppy and the initialization dialogue starts.

3.1.1 Initializing the KL Front-End

At the CTY, type the responses underlined in the dialogue shown below and press RETURN after typing each response. You cannot type ahead; you must wait for the system to respond after you press RETURN. The dialogue shown here is reproduced from a DECsystem-1091, KL10-E, system startup. Note that the messages printed by the system will differ slightly for DECsystem-1090, KL10-D, systems, but you should type the same answers to the questions, regardless of the type of system you are installing.

The KL initialization dialogue (KLINIT) starts automatically, prompting for commands with KLI>. Enter the responses that are underlined in the following example dialogue. Refer to the TOPS-10/TOPS-20 RSX-20F Reference Manual for a more thorough description of the KLINIT dialogue.

```
RSX-20F VE##-## hh:mm mmm-dd-yy

[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
[DX1: MOUNTED]
KLI -- VERSION VA##-## RUNNING
KLI -- ENTER DIALOGUE [NO,YES,EXIT,BOOT]?
KLI>YES<RET>
KLI -- KL10 S/N: 1042., MODEL B, 60 HERTZ
KLI -- KL10 HARDWARE ENVIRONMENT:
        MCA25 CACHE PAGER
        MOS MASTER OSCILLATOR
        EXTENDED ADDRESSING
        INTERNAL CHANNELS
        CACHE
```

BOOTING THE SYSTEM

The following question applies only to installations with an MCA25 cache pager. If you have an MCA25 cache pager, answer this question with BOTH and press RETURN.

```
KLI -- SELECT PAGE TABLE [FILE,BOTH,0,1]
KLI>BOTH<RET>
KLI -- PAGE TABLE SELECTED: BOTH
KLI -- RELOAD MICROCODE [YES,VERIFY,FIX,NO]?
KLI>YES<RET>
KLI -- MICROCODE VERSION ### LOADED
KLI -- RECONFIGURE CACHE [FILE,ALL,YES,NO]?
KLI>ALL<RET>
KLI -- ALL CACHES ENABLED
KLI -- CONFIGURE KL MEMORY [FILE,ALL,REVERSE,FORCE,YES,NO]?
KLI>ALL<RET>
```

```
LOGICAL MEMORY CONFIGURATION
ADDRESS      SIZE      INT      TYPE      CONTROLLER
000000000    768K      4      MF20      11
```

```
KLI -- LOAD KL BOOTSTRAP [FILE,YES,NO,FILENAME]?
KLI>YES<RET>
KLI -- WRITE CONFIGURATION FILE[YES,NO]?
KLI>NO<RET>
KLI --BOOTSTRAP LOADED AND STARTED
BOOT V#(##)
```

```
BOOT>
```

3.1.2 Booting the KL Monitor

At the BOOT> prompt, type the file specification of the monitor you are loading, followed by a switch to specify the tape drive controller name, and press RETURN. The file specification is optional, defaulting to the following:

```
DSKB:SYSTEM.EXE[1,4]/switch
```

Where '/switch' identifies the tape controller for the tape drive. One of the following switches may be used:

```
/TM02 or /TM03      for TU45 and TU77 tape drives. For drives other
                    than Unit 0, specify /TM02:u or /TM03:u, where 'u'
                    is the unit number.

/TM10                for TU10, TU40, and TU41 tape drives.

/TX01 or /TX02      for TU70, TU71, TU72 tape drives on a DX10
                    channel.

/DX20                for TU70, TU71, or TU72 on a DX20 channel.

/TM78:nx            for TU78/79 tape drives, where 'n' is a single
                    digit for the TM78's MASSBUS unit number and 'x'
                    is a single digit for the slave unit number.
```

BOOTING THE SYSTEM

When BOOT has located the monitor file on the tape, the loading procedure begins.

```
[Loading from DSKB:SYSTEM.EXE [1,4]]
```

When the system begins running, the system name is printed on the CTY:

```
KL10      dd-mmm-yy
```

The ONCE dialogue starts automatically when the monitor starts, allowing you to give the monitor the information it requires to run. Continue the installation procedure with Chapter 4, "Starting the Bootstrap Monitor". If ONCE fails to start, repeat the procedure from Step 2 in Section 3.1.

3.2 BOOTING THE KS SYSTEM

Before booting the KS system, you must mount the required media on the drives. The monitor, supporting CUSPS, and unbundled software are distributed on magnetic tape. If you are unfamiliar with the procedure for mounting software media, refer to the TOPS-10 Operator's Guide for instructions on mounting disk packs and magtapes.

First, you will mount the bootable tape. Check to see if there is a write ring in the reel. If present, remove it and mount the bootable tape on tape drive 0. You may use a drive other than MTA0. Next, mount a formatted disk pack on disk drive 0.

Start the bootstrapping procedure by typing MT to the KS10> prompt on the CTY. The system responds by printing the BOOT> prompt on the CTY.

```
KS10>MT<RET>
KS10>USR MOD

BOOT V#(##)

BOOT>
```

At the BOOT> prompt, type the file specification of the bootstrap monitor and a switch that specifies the tape drive controller, then press RETURN. The file specification is optional, defaulting to the following:

```
DSKB:SYSTEM.EXE[1,4]/switch
```

where '/switch' identifies the controller for the tape drive. The following switches may be used:

```
/TM02 or /TM03 for TU45 and TU77 tape drives.
```

When BOOT has located the monitor file on the tape, the loading procedure begins.

```
[Loading from DSKB:SYSTEM.EXE [1,4]]
```

When the system begins running, the system name is printed on the CTY:

```
KS10      dd-mmm-yy
```

The ONCE dialogue starts automatically when the monitor starts, allowing you to give the monitor the information it requires to run. Continue the installation procedure with Chapter 4, "Starting the Bootstrap Monitor". If ONCE fails to start, repeat the procedure from Section 3.2.

CHAPTER 4

STARTING THE BOOTSTRAP MONITOR

This chapter describes how to start up the bootstrap monitor using standard and default settings. The ONCE program always runs at monitor startup and offers several options to the way it can run. For complete information about ONCE, refer to Appendix A. This chapter contains only the information and procedures needed to start the bootstrap monitor on a new installation using default disk parameters.

ONCE allows the user to:

- o Keep a record of the reason for starting or reloading the system.
- o Provide the date and time for the monitor.
- o Define, change, and show structure and unit parameters.
- o Define, change, and show the system lists -- the system search list, the active swapping list, and the system dump list.
- o Start the monitor.

4.1 THE ONCE DIALOGUE

ONCE begins by printing, on the CTY, the system name and the date that the monitor was created. The system name can be changed when you run the MONGEN dialogue described in Chapter 9. After printing the system name and date, ONCE scans memory to be sure that it is accessible. Each monitor is built for a specific amount of memory. When you build your monitor using MONGEN, you will specify the amount of memory needed for your installation. Since you are installing a new system, you may receive the following message, indicating that the default monitor was built to expect more memory than that which is currently on-line:

```
%Memory from xxxxxx to yyyyyy is off-line
Set memory (DOWN,OFFLIN,ONLINE) [OFFLIN]:
```

For a new installation, you should type DOWN and press RETURN. ONCE then asks:

Why reload:

This question is asked whenever the system is reloaded. For the purpose of installing a new system, you should answer this question with NEW, and press RETURN.

STARTING THE BOOTSTRAP MONITOR

If you press RETURN without typing an answer, ONCE prints a list of the possible responses and their meanings. If you type HELP and press RETURN, you will be provided with a list of the possible responses and a more detailed explanation of each. These are also listed and described in Appendix A, Section A.1.

ONCE then asks for the date by printing:

Date:

Enter the date in one of the following forms:

MMM-DD-YY

or

DD-MMM-YY

Where MMM is replaced by the name of the month (JANUARY through DECEMBER) abbreviated to the first three characters of the month name (JAN through DEC), DD is the numerical day of the month (01 through 31) and YY is the year in a two digit year designation. Both the year and the hyphens are optional. After you enter the date and press RETURN, ONCE asks for the time:

Time:

Enter the time in one of the following forms:

HH:MM:SS

or

HHMMSS

Where HH is replaced by the hour, based on a 24-hour clock, MM is replaced by the minutes past the hour, and SS is replaced by the seconds past the hour, with optional colons separating the hours, minutes, and seconds. Enter the time and press RETURN.

It is very important that you respond with the correct date and time. If you do not, users' files may be written with the wrong creation dates, resulting in confusion and errors. If you enter the wrong date or time, you may correct the error later by selecting the CHANGE startup option followed by the DATE keyword. The CHANGE startup option is described in Appendix A.

After this initial dialogue, ONCE prompts you for a startup option by printing:

Startup option:

If you type HELP and press return, ONCE lists the startup options and switches and a brief explanation of each. This chapter describes how to start the monitor quickly using default values. If you prefer to define file structures to suit the particular needs of your installation, refer to Appendix A now for more information.

STARTING THE BOOTSTRAP MONITOR

4.2 BRINGING UP A NEW SYSTEM

To start the new installation quickly, follow the procedures in this section. The DEFINE option provides reasonable default values for most disk parameters, allowing you to create file structures that are usable by the monitor and to construct system lists from the units that are on line.

To DEFINE structure and unit parameters to suit the needs of your particular installation now, refer to Appendix A for complete information about the DEFINE startup option.

NOTE

If your disk units contain unknown information, you may find the DESTROY option useful. Refer to Appendix A for complete information about the DESTROY startup option.

So far, you have provided a reason for the reload (NEW), have set the date (in the format MMM-DD-YY or DD-MMM-YY) and have set the time (in the format HH:MM:SS or HHMMSS). Now, you are prompted for a startup option:

Startup option:

Enter DEFINE and press RETURN.

```
Startup option:DEFINE<RET>
Define (ASL,SDL,SSL,STRUCT):STRUCT<RET>
```

In the following dialogue, all numbers are decimal unless otherwise indicated. Values within parentheses are options. Values within square brackets are defaults which will be substituted if RETURN is pressed.

Any question preceded with an asterisk indicates changing that parameter will require the structure to be refreshed.

*** Note ***

HOME blocks will be initialized immediately after all units in the structure have been entered.

It is advisable that you define at least one structure to be DSKB. All examples in this manual use DSKB as the area to which files are copied.

```
Structure to define:DSKB<RET>
```

```
Disk drive for logical unit 0:RPA0<RET>
```

```
Disk drive for logical unit 1:<RET>
```

```
Do you want to see the bad regions (NO,YES) [NO]:NO<RET>
```

```
[HOME blocks initialized on RPA0]
```

STARTING THE BOOTSTRAP MONITOR

In the following section, default values are enclosed in square brackets. Default values are calculated by ONCE according to the structure type. Accept the default value by pressing RETURN.

Parameters for structure DSKB

*Blocks per cluster (3 - 262143) [10]:<RET>
Private structure (NO,YES) [NO]:<RET>
Owner PPN (NONE, [p,pn]) [NONE]:<RET>
Disk-set (1-36,ALL,NONE) [ALL]:<RET>
*Number of K for CRASH.EXE (0 - 4096) [1536]:<RET>
Blocks allowed for overdraw per user (0 - 307800) [500]:<RET>
Consecutive blocks tried for on output 90 - 262143) [30]:<RET>
*Bits per cluster count (0 - 18) [12]:<RET>
Make this the only structure in the SSL (NO,YES) [NO]:YES<RET>
Make this the only structure in the SDL (NO,YES) [NO]:YES<RET>

In the following section, specify a unit identification or press return to accept the default value. The unit identification resides in the HOME blocks on the disk unit, for unique identification of the disk pack. Therefore, it must be a unique number. The unit-id may be a combination of numbers and letters, and can have as many as 6 characters. You might find it useful to use the pack's serial number for part of the unit-id.

Parameters for unit RPA0

Unit ID [DSKB0]:<RET>
*SAT blocks per unit (8 - 81) [8]:<RET>
SAT blocks in core (1 - 8) [8]:<RET>
*K for swapping (0 - 4807) [1000]:4807<RET>
*First logical block for swapping (33090 - 269332) [134672]:<RET>
Swapping class (0 - 1) [0]:<RET>
Make this the only unit in the ASL (NO,YES) [NO]:YES<RET>
% Structure DSKB must be refreshed before it can be used.

Enter another structure to define or press RETURN and you will be prompted for another startup option.

Structure to define:<RET>

[Rebuilding the system search list from the HOM blocks]

[Rebuilding the active swapping list from the HOM blocks]

[Rebuilding the system dump list from the HOM blocks]

Startup option:

After a structure is defined, it must be refreshed. Enter REFRESH and press RETURN:

Startup option: REFRESH<RET>

Needs refreshing: DSKB

Structure to refresh: DSKB<RET>

[Updated HOM blocks on unit RPA0]

[Structure DSKB refreshed]

Structure to refresh:<RET>

[Rebuilding the system search list from the HOM blocks]

[Rebuilding the active swapping list from the HOM blocks]

[Rebuilding the system dump list from the HOM blocks]

Startup option:

STARTING THE BOOTSTRAP MONITOR

To start the monitor now, enter NOINITIA and press RETURN:

Startup option:NOINITIA<RET>

[Rebuilding the system search list from the HOM blocks]

[Rebuilding the active swapping list from the HOM blocks]

[Rebuilding the system dump list from the HOM blocks]

To automatically log in under [1,2] type "LOGIN"

KL10 Thursday 23-Jun-88 14:53:34

.

LOGIN<RET>

.

CHAPTER 5
BUILDING THE MONITOR FILE SYSTEM

Before you can build your monitor you must build the monitor file system. To do this, you will:

- o Restore files from the bootable tape, which you mounted before running ONCE.
- o Restore files from the Monitor/ANF-10 tape, which contains the sources for the monitor and ANF-10.
- o Restore files from the CUSP, or Commonly Used System Program tape. The files for the GALAXY batch and spooling system are included on this tape.

This chapter also explains how to restore files from the unbundled software tape, the customer-supported tape, and the TOOLS tape. All procedures apply to both KL and KS systems unless otherwise noted in the section title.

Before you can restore files from the bootable tape, you must assign a name to the tape. You mounted this tape when you booted the system, before running ONCE. The tape drive is identified to the monitor for your job using the following monitor command. On the CTY, type the following:

```
.ASSIGN MTA0: TAPE:<RET>
```

The system responds with:

```
MTA0 assigned
```

This command assigns the name TAPE to the tape unit MTA0. If the bootable tape is on a different tape drive, use the correct physical device name.

Next, if you are installing a KL system, Section 5.1 will show you how to restore the file that is used to allocate space on disk for the front-end file system.

Then, for both KL and KS systems, Section 5.2 will show you how to restore the BACKUP program, which will be used to copy the bootstrap monitor from tape to disk. If you are installing a KS system, skip Section 5.1 and go directly to Section 5.2.

BUILDING THE MONITOR FILE SYSTEM

5.1 ALLOCATING DISK SPACE FOR THE KL FRONT-END

This section describes how to restore a file that is used to allocate space for the front-end file system. On the CTY, type the following:

```
.REWIND TAPE:<RET>  
.GET TAPE:FEFILE<RET>
```

The system will respond with:

```
Job setup  
.
```

Now that the FEFILE job is set up, you will allocate space on a disk unit for the front-end file system. At the . prompt, type START and press RETURN:

```
.START<RET>
```

The system will respond with:

```
DISK UNIT NAME:
```

Enter a disk unit name and press RETURN. The following example assumes that the front-end file system will be stored on the disk unit RPA0. You may specify any physical disk unit for RPA0, but the disk must be dual-ported between the front-end and the KL, and must be an RP06 drive type.

```
DISK UNIT NAME:RPA0:<RET>
```

The system will respond with:

```
SIZE OF FILE IN BLOCKS (<CRLF> GIVES DEFAULT OF 2000):<RET>
```

Press RETURN to accept the default file size. There may be a delay before the front-end completes this operation. When the operation is complete, the system will respond with:

```
[2008 DATA BLOCKS ALLOCATED TO FE.SYS]  
[FE.SYS AREA STARTS AT LOGICAL BLOCK 2301.]  
[FRONT END FILE CREATED, HOM BLOCKS WRITTEN]
```

Next, you will restore the BACKUP program.

5.2 RESTORING BACKUP FROM TAPE

This section shows you how to restore the BACKUP program. You will use BACKUP to copy the bootstrap monitor from tape to disk and to restore the files from the Monitor/ANF-10 tape, CUSP tape, customer-supported tape, any unbundled software tapes, and the TOOLS tape.

BUILDING THE MONITOR FILE SYSTEM

The following example shows how to restore, save, and run BACKUP. Enter the commands that are underscored in the example:

```
.GET TAPE:BACKUP<RET>  
Job setup  
.SAVE BACKUP<RET>  
BACKUP saved  
.RUN BACKUP<RET>  
/  
.
```

The / sign is the BACKUP prompt, indicating that BACKUP is running and is ready to accept BACKUP commands. Next you will restore the bootstrap monitor. When that is completed, you will restore the monitor sources and associated software. The BACKUP program is discussed in the TOPS-10 Operator's Guide. This manual shows only the commands you need to type to restore the monitor and its supporting software.

5.3 RESTORING FILES FROM TAPE TO DISK

The examples in this manual use DSKB as the structure to which the files will be copied, and the area [10,7] for the directory area. The BACKUP program recognizes the ersatz device name DEC as SSL:[10,7], therefore the procedures in this manual use the device name DEC to represent DSKB:[10,7]. The area [1,4] is reserved for ersatz device SYS, from which system programs are run. Do not substitute another directory area for [1,4]. The procedures in this manual use the device name SYS to represent DSKB:[1,4].

5.3.1 Restoring the Bootstrap Monitor

Now, you will restore the bootstrap monitor from the bootable tape. For KL systems, type the following commands after the / prompt:

```
/TAPE TAPE:<RET>  
/SUPERSEDE ALWAYS<RET>  
/RESTORE SYS:=*.*<RET>  
"DONE  
/  
.
```

For KS systems, type the following commands:

```
/TAPE TAPE:<RET>  
/SUPERSEDE ALWAYS<RET>  
/INTERCHANGE<RET>  
/RESTORE SYS:=*.*<RET>  
"DONE  
/RESTORE DEC:=*.*<RET>  
"DONE
```

Unload the bootable tape. To do this, for both KL and KS systems, type the following command:

```
/UNLOAD TAPE:<RET>  
[MTA0: Read(C/H/S) = 7202000/0/0]
```

This command rewinds the tape and unloads it. Remove the tape from the drive.

BUILDING THE MONITOR FILE SYSTEM

The next section describes how to use BACKUP to restore the files from the Monitor/ANF-10 tape, from any unbundled software tapes, from the CUSP tape, the customer-supported tape, and the TOOLS tape.

5.3.2 Restoring the Monitor Sources and Associated Software

To copy the files from tape to disk, you must mount, restore, unload and dismount each tape. You may restore the tapes in any order, unless otherwise noted in the cover letter included with the specific tape.

Repeat the procedure below for each distribution tape, starting with the Monitor/ANF-10 tape.

1. Mount the distribution tape.
2. Type the following commands to restore the files:

```
/TAPE TAPE:<RET>
/REWIND<RET>
/SUPERSEDE ALWAYS<RET>
/PROTECTION 155<RET>
/SSNAME ALL<RET>
/RESTORE DSKB:<RET>
!10,7 DSKB
"DONE
/UNLOAD TAPE:<RET>
[MTA0: Read(C/H/S) = 7752000/0/0]
```

3. Dismount the tape.

After the files are on disk, exit from BACKUP by typing EXIT and pressing RETURN. Now you can create the TOPS-10 disk file system. To do this, you will create the system directories then copy the appropriate files into each directory.

5.4 CREATING THE TOPS-10 SYSTEM DIRECTORIES

The TOPS-10 monitor requires certain disk directories from which it can access support programs and CUSPs. You will create these directories on disk, then copy the files from the DSKB:[10,7] area to those directories. The monitor recognizes the ersatz device name DEC as DSKB:[10,7]. Therefore, the device name DEC is used in the following procedures.

The program that creates directories is CREDIR. The CREDIR program is described in the TOPS-10 User Utilities Manual. Only the commands you need to complete this procedure are demonstrated below.

In the following procedure, the ersatz device names recognized by the monitor are used to create the appropriate directories for storing monitor files. Each ersatz device name results in a directory area with the standard PPN that the monitor reserves for that purpose. A directory for the specified PPN will be created on each file structure in the system search list, unless you specify otherwise.

BUILDING THE MONITOR FILE SYSTEM

The ersatz device names used in this manual are defined as follows:

PPN	Name	Use
[10,7]	DEC:	DEC-supplied software
[1,4]	SYS:	System library
[2,5]	HLP:	HELP files
[5,14]	DOC:	DOC files
[5,11]	REL:	REL files
[5,17]	UNV:	MACRO universal files
[1,7]	ACT:	Accounting daemon files (ACTDAE)
[5,35]	UPS:	Files maintained by MX mail listener

Use the following commands to create the ersatz device directories. The directory areas will be created on each file structure in the system search list. CREDIR will report on each directory it creates on each file structure. In this example, DSKB is the only file structure in the system search list. Type the commands that are underscored in the following examples:

```
.RUN DSKB:[10,7,CREDIR]CREDIR<RET>
```

CREDIR will prompt you for the directory name you wish to create:

```
Create directory:HLP:<RET>  
Created DSKB0:[2,5].UFD/PROTECTION:775
```

Repeat for each directory name:

```
Create directory:DOC:<RET>  
Created DSKB0:[5,14].UFD/PROTECTION:775
```

```
Create directory:REL:<RET>  
Created DSKB0:[5,11].UFD/PROTECTION:775
```

```
Create directory:UNV:<RET>  
Created DSKB0:[5,17].UFD/PROTECTION:775
```

```
Create directory:ACT:<RET>  
Created DSKB0:[1,7].UFD/PROTECTION:775
```

```
Create directory:UPS:<RET>  
Created DSKB0:[5,35].UFD/PROTECTION:775
```

To exit from CREDIR, type CTRL/C:

```
Create directory:<CTRL/C>
```

BUILDING THE MONITOR FILE SYSTEM

5.5 COPYING THE FILES INTO DIRECTORIES

This section shows you how to copy the files from DEC into the appropriate directories. You will copy the files to the appropriate areas from DEC, using the NFT (Network File Transfer) program. NFT is described in the TOPS-10 User Utilities Manual.

The NFT prompt is an *. To run NFT, type the following command:

```
.RUN DSKB:[10,7,NFT]NFT<RET>  
*
```

To copy files you only need to use the COPY command as shown below. Use the COPY command to copy the files into their appropriate areas from DEC:

```
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.EXE<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.RAM<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.VFU<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]DDT.REL<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]JOB DAT.REL<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]OVLAY.REL<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]TECO.ERR<RET>  
*COPY HLP:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.HLP<RET>  
*COPY DOC:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.DOC<RET>  
*COPY REL:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.REL<RET>  
*COPY UNV:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.UNV<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]SYSTEM.CMD<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.SYS<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.INI<RET>
```

For KL systems, also copy the following files as shown:

```
*COPY REL:/PROTECTION:055=DSKB:[10,7,MON,KL]TOPS10.REL<RET>  
*COPY SYS:=DSKB:[10,7,*,*,*,*,*]DXMCA.ADX<RET>  
*COPY SYS:=DSKB:[10,7,*,*,*,*,*]DXMPA.A8<RET>  
*COPY SYS:=DSKB:[10,7,*,*,*,*,*]DXMCD.ADX<RET>  
*COPY SYS:=DSKB:[10,7,*,*,*,*,*]KNICOD.BIN<RET>  
*COPY SYS:=DSKB:[10,7,*,*,*,*,*]FEUIC.TXT<RET>
```

BUILDING THE MONITOR FILE SYSTEM

For KS systems, copy the following file as shown:

```
*COPY SYS:=DSKB:[10,7,*,*,*,*,*]SMFILE.EXE<RET>
```

To exit from NFT, type EXIT and press RETURN:

```
*EXIT<RET>
```

If you have not yet read the beware files, read them now. To find out what .BWR files are available, type the following:

```
.DIR DSKB:[10,7,*,*,*,*,*]*.BWR<RET>
```

You can display the files on your terminal using the TYPE command. Be sure to read all the files listed by the DIR command.

5.6 USING SYSTEM FILES

The SYS area includes several sample system files. The monitor uses these to create user accounts and to initialize system programs. After you complete the procedures in Chapter 9 you can tailor these files to your installation.

- o ACTDAE.SYS

This is the system's accounting file. It records the PPNs, passwords, access information, and disk quotas for users and operators. Without the ACTDAE.SYS file, no one (users or operators) can log in. Chapter 11 describes how to use the REACT program to maintain this file.

- o SYSJOB.INI

This file automatically starts system jobs. SYSJOB.INI is described in Chapter 12.

- o SYSTEM.CMD

This file can be read by OPR to automatically start batch and spooling processes for GALAXY (refer to Chapter 10).

- o TTY.INI

INITIA reads this file and initializes the CTY and TTY STOMPER functions. TTY.INI is described in Chapter 12.

Next, if you are installing a KL system, you will create the file system for the front-end. If you are installing a KS system, you will create the file system for the microprocessor. Chapter 6 describes these procedures.

CHAPTER 6

BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

The KL and KS processors are each supported by another processor. The KL processor uses a PDP-11 front-end for I/O, which requires space on disk for its software. The KS system uses an 8080 microprocessor that also requires disk space for storage. This chapter explains the procedure for creating these disk file systems. If you are installing a KL system, continue reading with Section 6.1. If you are installing a KS system, go directly to Section 6.2.

6.1 BUILDING THE KL FRONT-END FILE SYSTEM

To build the front-end file system, you must load the front-end from the front-end media, which you mounted according to the instructions in Chapter 3. The front-end software is distributed on either DECTapes or floppy diskettes. The commands that you will type to the RSX-20F command language processor, the PARSER, differ primarily in the physical device names used. The examples used to illustrate your communication with the PARSER, if not specifically separated by appropriate headings, apply to both DECTapes and floppies. In all examples, the commands that you will type are underscored.

The following procedures assume that the front-end file system will be stored on DSKB, mounted on RPA0. In fact, you can use any structure by replacing DB0 in the commands with DBn, where 'n' is the unit number in RPxn. Make sure that the disk unit is write-enabled and is dual-ported between the front-end and the KL.

KL systems may have more than one CPU by implementing Symmetric Multi-Processing (SMP). In a multiple-CPU system, each CPU has a front-end, and each front-end requires its own file system. If you are installing an SMP system, you must follow the steps in Section 6.1.1 and 6.1.2 for each CPU, at each CTY.

For DECTapes:

First, check to make sure that the DECTapes are mounted correctly.

The DECTape labelled DT-A should be mounted on DECTape drive 0, DT0:, and the unit selector switch should be set to 0. The DECTape labelled DT-B should be mounted on DECTape drive 1, DT1:, and the unit selector switch should be set to 1. On both DT0: and DT1:, set the LOCAL/REMOTE switch to REMOTE and the READ/WRITE switch to WRITE ENABLE.

BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

For floppies:

First, check to make sure the floppy diskettes are mounted correctly.

The floppy diskette labelled FLP-A should be mounted in the left-hand floppy drive DX0:, and the floppy diskette labelled FLP-B should be mounted in the right-hand floppy drive DX1:.

6.1.1.1 Loading the Front-End

Invoke the PARSER by typing CTRL/\ (control-backslash) on the CTY. This control character is not echoed, but the PARSER responds with the prompt PAR>, indicating that it is ready to accept commands.

NOTE

If you make an error at any time during your dialogue with the PARSER, type CTRL/Z followed by CTRL/. The PARSER prompt will be printed, and you can retype the command.

If you are loading RSX-20F from DEctape, allow at least 45 minutes to copy the files.

Type the SET CONSOLE MAINTENANCE and RESET commands to ensure that the KL is not running.

```
<CTRL/\>
PAR>SET CONSOLE MAINTENANCE<RET>
CONSOLE MODE: MAINTENANCE
PAR>RESET<RET>
```

PAR#

Set the data switches on the front-end control panel to 000003, with the first two switches (0 and 1) raised and the rest off.

Hold the ENABLE switch on and, at the same time, press the SW/REG switch. The front-end will print its software name and date and the location of the front end software.

For DEctapes:

RSX-20F VA##-## hh:mm dd-mmm-yy

```
[SY0: REDIRECTED TO DT0:]
[DT0: MOUNTED]
[DT1: MOUNTED]
```

For floppies:

RSX-20F VE##-## hh:mm dd-mmm-yy

```
[SY0: REDIRECTED TO DX0:]
[DX0: MOUNTED]
[DX1: MOUNTED]
```

Initialize the front-end by running the INIalization program. First, invoke the parser by typing CTRL/\, and type the following commands:

```
<CTRL/\>
PAR#MCR INI<RET>
INI>DB0:<RET>
```

The INI program does not prompt when initialization is complete. When initialization is complete, the lights on the drive panel stop flashing. Wait 30 seconds, then type CTRL/\ to invoke the parser.

```
<CTRL/\>
PAR#
```

BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

Mount the disk unit on which the front-end file system will reside. Run the MOU program by typing the following commands:

```
PAR#MCR MOU<RET>
MOU>DB0:<RET>

MOU -- MOUNT COMPLETED
MOU><CTRL/Z>
```

Create the front-end file system directory. Run the UFD program by typing the following commands:

```
<CTRL/\>

PAR#MCR UFD<RET>
UFD>DB0: [5,5]<RET>
```

The UFD program does not prompt the CTY when it is finished. When the lights on the front panel stop flashing, the operation is complete. Wait 30 seconds, then type CTRL/\ to invoke the parser.

```
<CTRL/\>
PAR#
```

If you are loading the front-end from DEctapes, you will copy the *.TSK files into directories before copying the rest of the files. If you are loading the front-end from floppies, you will copy all of the files now. Run the PIP program to copy the files from DEctape or floppy to disk. Exit from PIP by typing CTRL/Z. Type the following commands:

For DEctapes:

```
<CTRL/\>

PAR#MCR PIP<RET>
PIP>DB0:=DT0:F11ACP.TSK<RET>
PIP>DB0:=DT0:PARSER.TSK<RET>
PIP>DB0:=DT1:PIP.TSK<RET>

PIP><CTRL/Z>
```

For floppies:

```
<CTRL/\>

PAR#MCR PIP<RET>
PIP>DB0:=DX0:,DX1:<RET>

PIP><CTRL/Z>
```

Redirect the system. Run the REDirect program to redirect the system search area (SY0:) from DEctape or floppy to disk. Type the following commands:

```
<CTRL/\>

PAR#MCR RED<RET>
RED>DB0:=SY0:<RET>
```

The REDirect program does not prompt the CTY when it is finished. When the lights on the front panel stop flashing, the operation is complete. Wait 30 seconds, then type CTRL/\ to invoke the parser.

```
<CTRL/\>
PAR#
```

BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

If you are loading the front-end from DECTape, you will copy the rest of the files from DECTape to disk. This may take 25 minutes or more to complete. When this has been completed, list the directory of all the files in SY0: and exit from PIP. If you are loading the front-end from floppies, you have already copied the files and only need to list the directory. Type the following commands:

For DECTapes:

```
PAR#MCR PIP<RET>
PIP>DB0:=DT0:,DT1:<RET>
PIP>DB0:/LI<RET>
PIP><CTRL/Z>
```

For floppies:

```
PAR#MCR PIP<RET>
PIP>DB0:/LI<RET>
PIP><CTRL/Z>
```

Write front-end monitor to SY0:. Run the SAVE program to write the front-end monitor to SY0:. It is already defined as DB0:[5,5]. The DECTapes or floppies and disk are logically dismounted automatically. PIP will print warning messages about the files that already exist, but you may ignore these messages. Type the following commands:

For DECTapes:

```
<CTRL/\>
PAR#SET CONSOLE OPERATOR<RET>
PAR#MCR SAV<RET>
SAV>SY0:/WB<RET>
[DB0: DISMOUNTED]
[DT0: DISMOUNTED]
[DT1: DISMOUNTED]
```

For floppies:

```
<CTRL/\>
PAR#SET CONSOLE OPERATOR<RET>
PAR#MCR SAV<RET>
SAV>SY0:/WB<RET>
[DB0: DISMOUNTED]
[DX0: DISMOUNTED]
[DX1: DISMOUNTED]
```

For DECTapes:

Remove the DECTapes from drives 0 and 1, and mount the DECTape labelled DT-C on drive DT0:.

For floppies:

Remove the floppies from DX0: and DX1: and mount the floppy labelled FLP-C in drive DX0:.

Type the following commands:

For DECTapes:

```
<CTRL/\>
PAR#MCR MOU<RET>
MOU>DT0:<RET>
MOU -- MOUNT COMPLETE
MOU><CTRL/Z>
```

For floppies:

```
<CTRL/\>
PAR#MCR MOU<RET>
MOU>DX0:<RET>
MOU -- MOUNT COMPLETE
MOU><CTRL/Z>
```

BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

Copy the files to disk. Run PIP to copy the files from the third DECTape or floppy to disk and list the directory of files on DB0. Then, exit from PIP, dismount the DECTape or floppy and remove the media from the drive. Type the following commands:

For DECTapes:

```
<CTRL/\>

PAR#MCR PIP<RET>
PIP>DB0:=DT0:<RET>
PIP>TT:=DB0:/LI<RET>
PIP><CTRL/Z>

<CTRL/\>

PAR#MCR DMO<RET>
DMO>DT0:<RET>
DMO -- DISMOUNT COMPLETED
DMO><CTRL/Z>
```

For floppies:

```
<CTRL/\>

PAR#MCR PIP<RET>
PIP>DB0:=DX0:<RET>
PIP>TT:=DB0:/LI<RET>
PIP><CTRL/Z>

<CTRL/\>

PAR#MCR DMO<RET>
DMO>DX0:<RET>
DMO -- DISMOUNT COMPLETED
DMO><CTRL/Z>
```

You can now boot the RSX-20F front-end from the disk. This procedure is described in Section 6.1.2.

6.1.2 Booting the KL Front-End from Disk

To initiate the load, hold the ENABLE switch on and press the DISK switch at the same time. These switches are located on the drive panel. Following is the output when the front-end is loaded:

```
RSX-20F VA##-## hh:mm dd-mmm-yy

[SY0: REDIRECTED TO DB0:]
[DB0: MOUNTED]

KLI -- VERSION VA##-## RUNNING
KLI -- KL10 S/N: 2996., MODEL B, 60 HERTZ
KLI -- KL10 HARWARE ENVIRONMENT:
      MCA25 CACHE PAGER
      MOS MASTER OSCILLATOR
      EXTENDED ADDRESSING
      INTERNAL CHANNELS
      CACHE

KLI -- PAGE TABLE SELECTED: BOTH
KLI -- MICROCODE VERSION 2.1[###] LOADED
KLI -- ALL CACHES ENABLED

LOGICAL MEMORY CONFIGURATION
ADDRESS      SIZE      INT      TYPE      CONTROLLER
00000000    768K        4      MF20        11

KLI -- CONFIGURATION FILE WRITTEN
KLI -- BOOTSTRAP LOADED AND STARTED
BOOT V#(##)

[Loading from DSKB:SYSTEM.EXE[1,4]]

KL10 dd-mmm-yy
Why reload:
```


BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

The ONCE dialogue begins automatically. The startup options are described in Appendix A. For a quick startup, use the GO startup option. If you are installing a multiple-processor KL, repeat the procedures in Section 6.1 at the console for each CPU, then go on to Chapter 9 for information about building your monitor. If you are installing a single processor KL system, go to Chapter 9 now.

If you are installing a KS system, go on to Section 6.2.

6.2 CREATING THE KS MICROPROCESSOR FILE SYSTEM

This section describes the procedure for creating the file system for the KS microprocessor, and for booting the monitor.

6.2.1 Creating A Front-End File System Directory Area

If you are installing a new KS system, you must create a directory area on disk for the microprocessor file system. This area must be [6,2020], and it is recommended that you use the structure that resides on RPA0. Do not use a multiple-unit file structure for the microprocessor file system.

To create the directory area, type the following commands:

```
.R CREDIR<RET>
Create directory:DSKB:[6,2020]/EXIT<RET>
Created DSKB0:[6,2020].UFD/PROTECTION:775
```

6.2.2 Writing the Bootstrap Program to Disk

Next, you will write the bootstrap program to disk. To do this, run the SMFILE program as shown below. You must supply the serial number for your system's CPU. Note that the following example uses a CPU serial number of 4097.

```
.RUN DEC:SMFILE<RET>
DECSYSTEM 2020 DIAGNOSTICS FE-FILE PROGRAM
VERSION #.#, TOPS-10, KS10, CPU =4097
[FOR HELP TYPE "HELP"]

SMFILE>WRITE SETUP DSKB:<RET>
SMFILE>WRITE RESET<RET>
SMFILE>READ DEC:T10KL.RAM<RET>
SMFILE>SERIAL 4097<RET>
SMFILE>WRITE CRAM<RET>
SMFILE>WRITE BOOT DEC:KSBOOT.EXE<RET>
SMFILE>WRITE DONE<RET>
SMFILE>EXIT<RET>

EXIT
```

BUILDING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

The KS is now ready to run. Reload the monitor using the following commands:

<CTRL/\>

KS10>HA<RET>

When the CPU is halted, press the RESET buttons on the CPU panel.

KS10 CSL.V#.#

BT AUTO

BOOT V#(#)

BOOT><RET>

[Loading from DSKB:SYSTEM.EXE [1,4]]

You can load the monitor by typing commands to the BOOT program. To load the default monitor just press RETURN to the BOOT prompt. The default file name is DSKB:SYSTEM.EXE[1,4]. To load a different monitor, type the file name of the monitor to the BOOT prompt, taking care to include the structure name and the complete directory specification.

The ONCE dialogue begins automatically. The startup options are described in Appendix A. For a quick startup, use the GO startup option. After you choose a startup option, you can begin building a monitor. Go to Part 4, Chapter 9.

PART 3: UPGRADING AN EXISTING SYSTEM

This part is made up of two chapters which describe how to prepare your system for upgrade to a new version of the monitor. If you are installing a new system, go directly to Part 4, Chapter 9, "Building the Monitor".

CHAPTER 7

RESTORING THE DISTRIBUTION TAPES

Before you can upgrade your system, you must restore files from the distribution tapes to disk. You will use the BACKUP program to restore the files from the Monitor/ANF-10 tape, which contains the sources for the monitor and ANF-10. You will also restore the files from the CUSP, or Commonly Used System Program tape; the files for the GALAXY batch and spooling system are included on this tape. This chapter also explains how to restore files from the unbundled software tape, the customer-supported tape, and the TOOLS tape.

The files contained on the Monitor/ANF-10, CUSP, DECnet, and TOOLS tapes are stored on the tapes in a series of sub-file directories (SFDs) under the [10,7] PPN on structure DSKB:. The examples in this manual use DSKB: as the structure to which the files will be copied, and the area [10,7] for the directory area. After the tapes are restored, you will use NFT to copy the files into their appropriate directories.

IMPORTANT

Before proceeding, you should save your existing monitor sources, CUSPs, GALAXY components, and (for KL systems only) front-end file system on a backup disk or tape. This will allow you to fall back to your old monitor if the new monitor is difficult to install or run.

Existing KS installations require some of the files from the bootable tape. These files are not compatible with previous versions and are required for building the microprocessor file system and you must copy these files from the bootable tape before copying the TOPS-10 monitor and CUSPs. If you are upgrading a KS system, mount the bootable tape now. If you are upgrading a KL system, mount the Monitor/ANF-10 tape.

For existing systems already running GALAXY, ensure that the tape-drive you are using is not available to MDA by using the OPR command SET TAPE-DRIVE. MTA0 is used in the following example; if the distribution tape is on a different drive, use the correct physical device name.

```
.R OPR<RET>
OPR>SET TAPE-DRIVE MTA0 UNAVAILABLE
Enter text and terminate with ^Z<CTRL/Z>
^Z
OPR>
10:29:36 Device MTA0 -- Unavailable for use --
OPR>EXIT<RET>
```

RESTORING THE DISTRIBUTION TAPES

For both KL and KS systems, assign a name to the tape by typing the following command:

```
.ASSIGN MTA0: TAPE:<RET>
```

The system responds with:

```
MTA0 ASSIGNED
```

This command assigns the name TAPE to the tape unit MTA0.

The procedures for copying files from tape to disk use the BACKUP program. At the . prompt, type the following:

```
.R BACKUP<RET>
```

The / sign is the BACKUP prompt, indicating that BACKUP is running and is ready to accept BACKUP commands. The BACKUP program is discussed in the TOPS-10 Operator's Guide. This manual shows only the commands you need to type to restore the monitor and its supporting software.

If you are upgrading a KS system, continue with Section 7.1. If you are upgrading a KL system, go directly to Section 7.2.

7.1 RESTORING KS MICROPROCESSOR FILES

The following commands allow you to restore the files needed to upgrade a KS microprocessor file system. Type the commands that are underscored in the following procedure:

```
| /TAPE TAPE:<RET>  
| /SUPERSEDE ALWAYS<RET>  
| /INTERCHANGE<RET>  
| /RESTORE DEC:=SMFILE.EXE<RET>  
| "DONE  
| /RESTORE DEC:=T10KL.RAM<RET>  
| "DONE  
| /RESTORE DEC:=KSBOOT.EXE<RET>  
| "DONE  
| /UNLOAD TAPE:<RET>  
| [MTA0: Read(C/H/S) = 7752000/0/0]
```

Remove the bootable tape from the drive and mount the Monitor/ANF-10 tape. Then, proceed with the instructions in Section 7.2.

7.2 RESTORING THE MONITOR SOURCES AND ASSOCIATED SOFTWARE

To copy the files from tape to disk, you must mount, restore, unload and dismount each tape. You may restore the tapes in any order, unless otherwise noted in the cover letter included with the specific tape.

RESTORING THE DISTRIBUTION TAPES

Repeat the procedure below for each distribution tape, starting with the Monitor/ANF-10 tape. If you wish to restore the tapes to an area other than DSKB:[10,7], you must specify this area in the /RESTORE command line in the procedure below.

1. Mount the distribution tape.
2. Type the following commands to restore the files:

```
/TAPE TAPE:<RET>  
/REWIND<RET>  
/SUPERSEDE ALWAYS<RET>  
/PROTECTION 155<RET>  
/SSNAME ALL<RET>  
/RESTORE DSKB:<RET>  
!10,7 DSKB  
"DONE  
/UNLOAD TAPE:<RET>  
[MTA0: Read(C/H/S) = 7752000/0/0]
```

3. Dismount the tape.

After the files are on disk, exit from BACKUP by typing EXIT and pressing RETURN.

Next, you will copy the files to the appropriate areas from DSKB:[10,7], using the Network File Transfer (NET) program. NET is described in the TOPS-10 User Utilities Manual.

To copy files you only need to use the COPY command as shown below. Use the COPY command to copy the files into their appropriate areas from DSKB:[10,7]:

```
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.EXE<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.RAM<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.VFU<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]DDT.REL<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]JOB DAT.REL<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]OVLAY.REL<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]TECO.ERR<RET>  
*COPY HLP:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.HLP<RET>  
*COPY DOC:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.DOC<RET>  
*COPY REL:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.REL<RET>  
*COPY UNV:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.UNV<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]SYSTEM.CMD<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.SYS<RET>  
*COPY SYS:/PROTECTION:055=DSKB:[10,7,*,*,*,*,*]*.INI<RET>
```

RESTORING THE DISTRIBUTION TAPES

For KL systems, also copy the following files as shown:

*COPY REL:/PROTECTION:055=DSKB:[10,7,MON,KL]TOPS10.REL<RET>

COPY SYS:=DSKB:[10,7,,*,*,*,*]DXMCA.ADX<RET>

COPY SYS:=DSKB:[10,7,,*,*,*,*]DXMPA.A8<RET>

COPY SYS:=DSKB:[10,7,,*,*,*,*]DXMCD.ADX<RET>

COPY SYS:=DSKB:[10,7,,*,*,*,*]KNICOD.BIN<RET>

COPY SYS:=DSKB:[10,7,,*,*,*,*]FEUIC.TXT<RET>

For KS systems, copy the following file as shown:

COPY SYS:=DSKB:[10,7,,*,*,*,*]SMFILE.EXE<RET>

To exit from NFT, type EXIT and press RETURN:

*EXIT<RET>

If you have not yet read the beware files, read them now. To find out what .BWR files are available, type the following:

.DIR DSKB:[10,7,*,*,*,*,*]*.BWR<RET>

You can display the files on your terminal using the TYPE command. Be sure to read all the files listed by the DIR command. After reading the beware files, go on to Chapter 8, "Restoring the Supplementary Processor's File System".

CHAPTER 8

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

The KL and KS processors are each supported by another processor. The KL processor uses a PDP-11 front-end for I/O, which requires space on disk for its software. The KS system uses an 8080 microprocessor that also requires disk space for storage. Sections 8.1 and 8.2 explain the procedure for restoring the front-end file system for KL systems. For KS systems, Section 8.3 explains the procedure for restoring the bootstrap program to disk.

If you are upgrading a KL system, continue reading with Section 8.1. If you are upgrading a KS system, go directly to Section 8.3.

8.1 RESTORING THE DISTRIBUTED KL FRONT-END SOFTWARE

For existing installations, where modifications have been made to the front-end software, you should copy the current front-end file system from FE.SYS[1,4] to a backup disk area to resolve those modifications with the new version of the front-end.

The front-end software for KL systems is distributed on the Monitor/ANF-10 tape. Additional installation tools are distributed on the CUSP tape. You must restore these tapes to disk, following the procedures in Chapter 7, before beginning the installation.

If you have used DSKB:[10,7] as the distribution area on disk, the following Sub-File Directories (SFDs) will exist:

- DSKB:[10,7,RSX20F] Contains the distributions of RSX20F for both DECTape and floppy based systems. It also contains RSXINS.MIC, the master installation command file. RSXINS.MIC is described in Section 8.2.
- DSKB:[10,7,FELOAD] Contains FELOAD.BIN, a PDP-11 program which will be placed in the boot blocks of the disk containing the front-end file system during the installation process.
- DSKB:[10,7,F11] Contains F11, a tool used to manipulate the front-end file system. The RSXINS.MIC installation process will use F11 to create and populate a new RSX20F file system.

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

A Monitor Interpreted Commands (MIC) file, named RSXINS.MIC, distributed on DSKB:[10,7,RSX20F], performs all of the steps necessary to create a new FE.SYS file. It will:

- o Ask a set of questions about the installation, such as the target disk for the installation, where the distribution files are stored, and whether or not the console front-end should be reloaded.
- o Use F11 to create and populate a new FE.SYS file on the target disk.
- o Use F11 to write the contents of FELOAD.BIN into the boot blocks of the target disk.
- o Run DTELDR to reload the front-end with the new software. This is done if you answer YES to Question 7 of the installation dialogue. The installation dialogue is described in Section 8.2.1.

The next section describes the RSXINS installation process in detail.

8.2 USING RSXINS

Before running RSXINS, you must make sure of the following:

- o Your system must be running MIC Version 11 or later.
- o The CUSP tape must be restored so that its subdirectory organization is preserved. This procedure is described in Chapter 7.
- o You must be logged in as [1,2]. The F11 program, which is invoked by RSXINS, uses Super USETI/USETO calls to do its work. These can only be executed by a job logged in as [1,2].

8.2.1 The RSXINS Dialogue

A sample run of the RSXINS procedure is reproduced below. The dialogue questions are numbered for clarity in this text, but are not numbered in the dialogue itself. In the following example, RSXINS is used to install a new front-end file on structure DSKE on a 1090 (DECTape-based) KL system.

RSXINS is invoked by the command:

```
.DO DSKB:RSXINS[10,7,RSX20F] <RET>
```

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

It will display the following:

```
RSXINS -- RSX-20F Front-End File System Installation Procedure
```

```
Installation started at 16:29:17 on Tuesday, 08-Mar-88
```

This procedure will create, populate, and make bootable an RSX-20F front-end file system on any TOPS-10 structure.

In the following dialogue, default answers are enclosed within square brackets. If you would like further information about any question, answer it with a question mark (?). If you wish to return to the previous question asked, answer with a left-hand angle bracket (<).

RSXINS checks to see if you are logged into [1,2]. If you are not, it will abort execution. Otherwise, it will begin a dialogue with you to obtain all of the installation information needed. In the dialogue, each question provides a default answer enclosed in square brackets ([]). To take the default answer, press the RETURN key.

If you need help at any time with the answer to a particular question, you can respond with a question mark (?). RSXINS will then provide an explanation of the question and the appropriate type of reply it expects. Then, it will repeat the question.

If you wish to go back to the previous question that was asked, you can type a left-hand angle bracket (<). RSXINS will repeat the previous question, showing your previous reply as the default.

RSXINS will first ask for the name of the target disk structure or unit:

```
1 * Which disk structure do you wish to put the FE.SYS area on  
[DSKB]? DSKE <RET>
```

Respond to this question with either the four-character name of a disk structure or with the name of a specific disk unit (such as RPA0). Use the physical unit name if you are installing FE.SYS on a disk that is part of a multiple-unit structure.

Next you will specify the location of the RSX20F distribution files. The default is the area in which the executing RSXINS file is located.

```
2 * Where is the distribution area of the front-end files located  
[DSKB:[10,7,RSX20F]]? <RET>
```

You will now be asked if the two programs used by the procedure, FELOAD.BIN and F11.EXE, exist on SYS:.

```
3 * Are the FELOAD.BIN and F11.EXE files on SYS: [N]? <RET>
```

These two files, described in the explanations for the next two questions, normally exist in the subdirectories [10,7,FELOAD] and [10,7,F11] on the CUSP tape. If you have moved these two files to SYS: prior to invoking RSXINS, answer Y, otherwise, answer N. The default answer is N.

If you answered Y, proceed to question 6.

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

Next, you will be asked to specify the location of FELOAD, the new PDP-11 bootstrap program. The default answer will be the FELOAD subdirectory on the same disk and PPN where the executing RSXINS file is located.

4 * Where is the distribution of FELOAD located
[DSKB:[10,7,FELOAD]]? <RET>

Next, specify the location of F11, a tool used by the procedure to manipulate FE.SYS files. The default answer will be the F11 subdirectory on the same disk and PPN where the executing RSXINS file is located. For example:

5 * Where is the F11 program distribution area located
[DSKB:[10,7,F11]]? <RET>

Your answer to the next question determines which variant of RSX-20F will be installed on your system. The valid responses for Question 6 are either F or D, as follows:

- o F specifies the floppy-based version (VE##-##) of RSX-20F;
- o D specifies the DECTape-based version (VA##-##).

The default is D, indicating a DECTape-based system.

6 * Is this for a Floppy (F) or DECTape (D) based system [D]? <RET>

In Question 7, RSXINS will ask how large you wish to make the FE.SYS file. The default size is 2000 blocks. The FE.SYS file is allocated contiguously on the disk. If the new FE.SYS file is larger than the previous one, or if there is no previous file, the new file will be created beginning at a place on the disk that is:

- o on a block that is a multiple of 400 (decimal); and
- o in an area where the disk space is available contiguously.

If the requested number of blocks for FE.SYS is not available with a beginning position on a multiple of 400 blocks, then the procedure will fail. In that case, it will be necessary to backup the disk, refresh it, run RSXINS to create the FE.SYS file, and then restore the rest of the disk's files. The procedures for disk backup, refresh, and restoration are documented in Chapter 14 of the TOPS-10 Operator's Guide.

If the FE.SYS file is created on a disk with user files on it, there can be a delay of up to 20 seconds between the messages "[SY0: redirected to DB0:]" and "[DB0: mounted]" when RSX-20F is reloaded.

7 * How many blocks should be reserved for the new FE.SYS file
[2000]? <RET>

In Question 8, RSXINS will ask if the console front-end is currently using the target structure. If you accept the default answer of YES, then RSXINS will run DTELDR to reload the console front-end processor using the newly-installed RSX-20F software on the target disk. If you answer NO, it will perform only the software installation.

8 * Is the target structure currently in use by RSX-20F [Y]? <RET>

If you answered NO to this question, please skip to Question 10.

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

If you answered YES, RSXINS will then display a cautionary message:

**** Note **** It is important that the console FE running on the target structure (DSKE:) not access the FE.SYS area during the course of the installation, otherwise the front-end system could crash. This in itself is not a problem, because RSXINS will reload the FE after the new file system is built. However, if the KL10 CPU were to crash during the installation procedure before the update process was completed, then the front-end would not be rebootable from the RP06 disk. It would be necessary to boot the front-end from console media (floppies or DECTapes), after which you could then reload the monitor.

While this is unlikely, it is possible. There are steps that you can take to minimize this risk further, such as:

- o Use the SHUTDOWN or STOP commands in OPR to stop any unit-record devices (card readers and line printers) connected to the front-end during the update.
- o Do not run this procedure if the time is within 15 minutes of midnight. This prevents the possibility of RSX-20F attempting to run the MIDNIT task during the update. If it is close to midnight, refrain from answering the final question in this procedure until after 12:01 AM (by the system clock).
- o Avoid running this procedure if the monitor is unstable or there is a high incidence of hardware failures. A system crash in the middle of the procedure would leave the FE.SYS file in a partially-updated state. The front-end would then have to be reloaded from console media.

After this text is displayed it will ask:

* Do you wish to see this text again [N]?

The default answer of N will cause RSXINS to proceed to the next question; a Y will retype the warning message.

If you are running a single-processor KL system, please skip down to Question 10. If you are running an SMP system, answer the following question with the CPU number whose console front-end area you are installing. The default is CPU 0.

9 * Which CPU's console front-end do you wish to reload [0]? <RET>

You have entered all the parameters required by RSXINS. A summary of the selected parameters is displayed for you to check:

Here is a summary of the options you have selected for this installation.

```
Target disk structure for installation: DSKE
Location of RSX20F distribution area:  DSKB:[10,7,RSX20F]
Location of FELOAD distribution area:  DSKB:[10,7,FELOAD]
Location of F11 distribution area:     DSKB:[10,7,F11]
Installation type (D=DECTape, F=Floppy): D
Size of FE.SYS file to be created:    2000
Structure currently in use by RSX20F:  Y
Console front-end to be reloaded on CPU: 0
FE.SYS currently exists on DSKE:      Y
```

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

Please indicate if these choices are correct. If you answer the following question with a NO, the entire RSXINS dialogue will be restarted.

10 * Are the above correct (Y or N) [No default] ? Y

If you respond with N, RSXINS will restart the dialogue. Your original response will become the new defaults for each question. If you respond with Y, RSXINS will proceed to install the new front-end software, as described in Section 8.2.2.

8.2.2 Automatic Front-End File System Installation

RSXINS now begins the installation process. It will first check to see if the FELOAD and F11 programs and the RSX-20F subdirectories exist in the places you have specified. If it does not find one of them, it will abort the installation and exit to monitor level. If all files are located successfully, you will see the following messages:

All questions have been asked. The procedure will now verify that required SFDs and files exist.

All files have been located. Commencing actual installation procedure.

Now it will check to see if an FE.SYS file already exists on the target structure/unit. If an FE.SYS file does exist, RSXINS will run F11 and delete the file from the target disk:

Deleting existing DSKE:FE.SYS[1,4] file...

[OK]

RSXINS will now create and populate a new FE.SYS file. RSXINS will:

- o Initialize the FE.SYS area, allocating the number of blocks you requested in the dialogue.
- o Create a [5,5] UIC directory in the file.
- o Copy the file CORIMG.SYS, containing the bootable image of RSX20F, to the [0,0] directory, replacing the placeholder file created when the area was initialized.
- o Copy the rest of the RSX20F files to the [5,5] directory area.
- o Copy FELOAD.BIN to the boot blocks (blocks 1 and 4 through 7) of the disk unit.

The output from RSXINS will look like this:

```
Creating new front-end file on DSKE...
Defining a new [5,5] UFD on the area...
Placing RSX-20F system image on the area...
Placing RSX-20F files on the [5,5] UFD in the area...
Writing FELOAD.BIN into the disk boot blocks...
[OK]
```

If you answered NO to Question 7, RSXINS will finish at this point. If you answered YES, RSXINS will use DTELDR to reload the console front-end.

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

8.2.3 Automatic Front-End Reload

RSXINS will run DTELDR to reload the console front-end that is using the target disk. On a single-processor KL system, this will automatically be front-end 0 on CPU 0. For an SMP system, the console front-end on the CPU specified in response to Question 8 will be reloaded, completing the installation procedure for RSX-20F:

```
Now reloading front-end 0 using newly-installed RSX-20F...
```

```
Front-end 0 started
```

```
RSXINS procedure finished at 16:34:06 on Tuesday, 08-Mar-88
```

For a multi-processor KL system, repeat the procedures in Sections 8.1 and 8.2 for each CPU's front-end file system.

Section 8.3 describes the procedure for writing the bootstrap program to disk for KS systems. If you are installing or upgrading a KL system, go on to Chapter 9.

8.3 WRITING THE KS BOOTSTRAP PROGRAM TO DISK

To upgrade an existing KS system, it is not necessary to rebuild the KS microprocessor's file system. However, before you can boot the monitor, you must write the bootstrap program to disk.

To do this, run the SMFILE program as shown below. You restored this program from the bootable tape in Chapter 7. You must use the version of SMFILE shipped with TOPS-10 Version 7.04 and you must supply the serial number for your system's CPU. Note that the following example uses a CPU serial number of 4097.

```
.RUN DEC:SMFILE<RET>
```

```
DECSYSTEM 2020 DIAGNOSTICS FE-FILE PROGRAM  
VERSION #.#, TOPS-10, KS10, CPU =4097  
[FOR HELP TYPE "HELP"]
```

```
SMFILE>WRITE SETUP DSKB:<RET>  
SMFILE>WRITE RESET<RET>  
SMFILE>READ DEC:T10KL.RAM<RET>  
SMFILE>SERIAL 4097<RET>  
SMFILE>WRITE CRAM<RET>  
SMFILE>WRITE BOOT KSB00T.EXE<RET>  
SMFILE>WRITE DONE<RET>  
SMFILE>EXIT<RET>
```

```
EXIT
```

RESTORING THE SUPPLEMENTARY PROCESSOR'S FILE SYSTEM

The KS is now ready to run. Reload the monitor by typing the following commands on the CTY:

<CTRL/\>

KS10>HA<RET>

When the CPU is halted, press the RESET buttons on the CPU panel.

KS10 CSL.V#.#

BT AUTO

BOOT V#(#)

BOOT><RET>

[Loading from DSKB:SYSTEM.EXE [1,4]]

You can load the monitor by typing commands to the BOOT program. To load the default monitor just press RETURN to the BOOT prompt. The default file name is DSKB:SYSTEM.EXE[1,4]. To load a different monitor, type the file name of the monitor to the BOOT prompt, taking care to include the structure name and the complete directory specification.

The ONCE dialogue begins automatically. The startup options are described in Appendix A. For a quick startup, use the GO startup option. Here is a sample GO startup dialogue. Only the first few lines of system startup output are included for clarity:

KS10 dd-mm-yy

Why reload: NEW<RET>

Date: 22-Aug-88<RET>

Time: 17:17<RET> .

Startup option: GO<RET>

KS10 17:18:12 CTY system 4097

Connected to Node CENTRA(0) Line 51

.LOGIN 1,2

.R OPR

OPR>

PART 4: BUILDING THE MONITOR AND TAILORING THE SYSTEM

This part is made up of four chapters that describe how to build your monitor and tailor the system to the particular needs of your site. All system installations require the procedures in Part 4.

CHAPTER 9

BUILDING YOUR MONITOR

Even though you have a running monitor, the bootstrap monitor is only a tool for configuring a monitor for the system. When you build the monitor, you configure support for the peripheral devices, memory units, terminal and network lines, and supply information that the monitor needs to run CUSPs successfully. You will build the monitor using the MONitor GENerator (MONGEN) program, assemble the monitor with MACRO, and load and save the monitor with LINK. Then you will bring up your new monitor and create a bootable monitor tape. Later sections describe how to automate the build procedure and customize BOOT.

This chapter describes the following steps to build the monitor:

1. Run MONGEN.

Run MONGEN and answer the questions in the dialogue section. MONGEN creates symbol definition source files, containing information obtained from your answers to the dialogue questions. You use the source files to build your monitor.

MONGEN creates the following source files:

- o SYSCNF.MAC contains the symbol definitions for the hardware and software configuration.
- o F.MAC contains feature test switches and their settings. If you change the setting of any of the feature test switches in the FGEN dialogue, or if you add any feature test switches, you must then reassemble the bundled monitor modules to create a new monitor library file, TOPS10.REL. This procedure is described in Appendix B.

2. Assemble the source modules.

The COMMON, COMDEV, and COMMOD modules of the monitor must be assembled with the symbol definitions recorded in the MONGEN configuration file, SYSCNF.MAC.

3. Link and load the monitor.

The modules must be linked with the monitor library file, TOPS10.REL, and with any unbundled software (such as MPE) that your installation has chosen to run. These are combined to form a runnable, executable monitor in a file named SYSTEM.EXE.

BUILDING YOUR MONITOR

9.1 MONGEN

MONGEN is a dialogue program that allows you to choose the software modules and features that are most appropriate for your installation and to define your hardware and software configuration. MONGEN builds MACRO-10 source files. The MONGEN-created source files contain the information needed to create an executable monitor that is specific to your installation. Parameters that are assigned in these files determine how the monitor data base is assembled.

Before running MONGEN, do the following:

1. Read this chapter to acquaint yourself with the current version of the MONGEN dialogue.
2. Be thoroughly familiar with your system configuration.
3. Predetermine the answers you will provide to the questions in the MONGEN dialogue. Worksheets 1 and 2, provided in Chapter 2, will help you determine your responses.
4. Obtain a copy of the product-specific installation guide for each unbundled product you wish to use, and familiarize yourself with any modifications to the following procedures that might be necessary for installing unbundled software. Special installation instructions for unbundled software products are available in product-specific installation guides.

The MONGEN dialogue is divided into the following sections, each asking questions about a specific aspect of the system configuration:

SYSGEN Defines the hardware and software configuration. This includes type and number of CPUs, processor characteristics, ports for data communications, tape and disk units, line printers, and other peripheral devices. SYSGEN defines the terminal configuration, including the OPR line number and the dataset line numbers. SYSGEN also offers some services of the monitor that you may refuse or accept. SYSGEN is the longest portion of the MONGEN dialogue, and it creates the SYSCNF.MAC file.

FGEN Allows you to change the settings of feature test options, thus enabling and disabling the software features and symbol values that the monitor uses to determine how to service users and how to perform maintenance operations. You must run FGEN. FGEN creates the F.MAC file, which is required for building the monitor. If you change the default switch settings you must rebuild all the monitor library files, thus creating a monitor that is not supported by DIGITAL. For more information, refer to Appendix B.

If you are building the monitor for the first time, answer all the questions in the SYSGEN dialogue first, then answer the questions in the FGEN dialogue. On subsequent occasions, select SYSGEN if you want to make changes to your hardware or software configuration, and select FGEN if you want to change any feature test switch settings or add any new feature test switches.

BUILDING YOUR MONITOR

9.1.1 Running MONGEN

You can run MONGEN from any disk area, and the source files that are generated are stored in your job's default disk area (DSK) or any other disk area you specify. Make sure that the disk area where the monitor is to be built has at least 7000 free disk blocks. Clear the directory area of any extraneous files to eliminate the possibility of confusion when assembling the monitor.

MONGEN has three modes of dialogue (SHORT, PROMPT, and LONG) to service users of different levels of experience. Throughout the dialogue, MONGEN questions take the form of the mode you choose. MONGEN questions are in the form:

question (default,possible answers) [explanation]:

An explanation of the three modes and the form the questions take in each mode, is provided below:

<u>Mode</u>	<u>Effect</u>
SHORT	MONGEN prints only the questions on your terminal. This mode assumes that you need no listing of default or possible answers, and no explanation of the question. MONGEN assumes that you are familiar with the choice of answers. SHORT mode is recommended only for experienced users.
PROMPT	MONGEN prints each question, but adds (in parentheses) a choice of answers. The default value, if any, is printed first in the parenthesis, followed by the other answers you may type, separated by commas. Due to the nature of some of the questions, a default answer may not be offered. This is the default mode and it is used in this section to illustrate the dialogue.
LONG	MONGEN prints each question, the choice of answers (in parentheses), and adds an explanation of the question [in square brackets]. LONG mode is strongly recommended for all first-time users of this version of MONGEN.

Each question, regardless of the mode chosen, ends with a colon. If you choose PROMPT or LONG mode, select your answer from the possible answers listed within parentheses and enter it after the colon. To accept the default answer, just press RETURN. If the question has no default, MONGEN prints an error message and repeats the question. The possible answers are listed in one of these forms:

(d,m-n)	A range of numbers is provided, where 'd' is the default value, 'm' is the smallest number and 'n' the largest number you may type. Choose a number in that range. Numbers are decimal unless specified otherwise in the question.
(m-n)	A range of numbers with no default value is provided. For example, you can specify multiple, consecutive terminal lines by answering with a range of numbers in the form (m-n).
(YES,NO)	Answer with YES or NO
(a,b,c,...,z)	Choose one of the values in the list.

BUILDING YOUR MONITOR

If you type an invalid or inappropriate response, MONGEN prints an error message and repeats the question so that you can respond to the question again.

To execute the version of MONGEN in DSK:[10,7,MON], type the following command:

.R SETSRC<RET>

*CP [10,7,MON]<RET>

*<CTRL/C>

.RUN MONGEN<RET>

MONGEN responds with:

Write MONGEN.MIC (YES,NO):NO<RET>

You answer this question with YES if you want to record the entire dialogue. This record would be useful for building several similar monitors.

After you answer this question, MONGEN begins:

MONGEN for 704 monitors

MONGEN will generate any known TOPS-10 configuration. For information about which configurations are supported, please refer to the SPD.

/HELP (PROMPT,SHORT,LONG) :/HELP<RET>

Since PROMPT is the default mode, MONGEN provides a list of possible answers in parentheses. If you now type /HELP, MONGEN provides the LONG version of this question:

MONGEN for 704 monitors.

MONGEN will generate any known TOPS-10 configuration. For information about which configurations are supported, please refer to the SPD.

/HELP (PROMPT, SHORT, LONG) [

All numbers are decimal unless stated otherwise

Unique abbreviations are allowed everywhere to all questions

/HELP reasks a question in the next longer mode

/HELP:xxx sets the mode permanently. Modes are:

SHORT is short

PROMPT has choices in ()

LONG has choices in () and an explanation in []:PROMPT<RET>

As shown above, you may ask MONGEN for the next longer version of the current question by typing /HELP. If you wish to change modes for the remaining questions, type /HELP:mode, where 'mode' can be SHORT, PROMPT, or LONG. For example, if you choose SHORT mode and later want to change to LONG mode for the remaining questions, type:

/HELP:LONG

This will set the mode to LONG for the remainder of the dialogue. You can answer any question with LONG to get the LONG explanation for that specific question.

To exit from MONGEN at any time, type <CTRL/Z>.

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9.1.2 The MONGEN Dialogue Questions

This section lists the dialogue questions for each part of MONGEN. A number precedes each MONGEN question. These numbers help you to follow the dialogue more easily, and they are not actually displayed when you run MONGEN.

NOTE

MONGEN asks some questions only for specific types of systems; and asks others only if you answer a preceding question in a certain way.

Before running MONGEN, read this chapter carefully. Decide the answers for each question in the dialogue. Worksheets 1 and 2 are provided in Chapter 2 to help you record your responses to the MONGEN questions. If you like, you can create a .MIC file to run MONGEN, and answer the questions in the .MIC file to save time.

This section lists the MONGEN questions in PROMPT mode, which is the default mode. Use LONG mode or type /HELP after a question to get more information about each question.

1 Which GEN (SYS,F):

Respond with SYS or F to indicate the section that you wish to run. If you respond with SYS, MONGEN displays the SYSGEN questions. When the SYSGEN dialogue is done, MONGEN asks Question 1 again, so that you can start the FGEN part of the MONGEN dialogue. The SYSGEN questions are listed in Section 9.1.2.1. The FGEN questions are listed in Section 9.1.2.2.

9.1.2.1 Running SYSGEN - SYSGEN asks questions about the hardware and software of your system. This includes the central processor(s), storage devices, and other peripheral devices.

2 Output (DSK:SYSCNF.MAC):

3 DECsystem10 (KL,KS):

Question 4 is asked for KL systems only.

4 CPUs (1,1-6):

5 System name:

Question 6 is asked for each CPU.

6 CPU serial # (1-10000):

7 Exclude monitor overhead from user run time (YES,NO):

Questions 8 and 9 are asked for KL systems only. Question 9 is asked only if you answer Question 8 with YES.

8 EBOX/MBOX runtime accounting (YES,NO):

9 Exclude PI time from user runtime (YES,NO):

10 Account verification (YES,NO):

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Questions 11 and 12 are asked for KL systems only.

- 11 MOS memory (YES,NO):
- Autoconfigured device options:
- 12 Include SCA (NO,YES,PROMPT):

If you answer Questions 12 through 16, 20, 21, 26, and 31 through 39 with PROMPT, you will be asked the following questions:

- Device code (CR,0-774):
- Drive, slave, or unit:
- Data:
- Do you want to specify more data (NO,YES):

You must answer YES to Question 13 if you want to use LAT software.

- 13 Include Ethernet service (NO,YES,PROMPT):
- 14 Include SA10 device support (NO,YES,PROMPT):

Questions 15 through 17 are asked for KL systems only.

- 15 Include RP01/2/3 disks (NO,YES,PROMPT):
- 16 Include Swapping drums (NO,YES,PROMPT):

If you answer Questions 17, 19, 22, and 27 through 30 with PROMPT, and Question 18 with YES, you will be asked the following questions:

- Device code (CR,0-774):
- Massbus device (0,0-7):
- Drive, slave, or unit:
- Data:
- Do you want to specify more data (YES,NO):

- 17 Include RS04/5 Massbus disks (NO,YES,PROMPT):
- 18 Prompt for RP0x/RM0x Massbus disks (NO,YES):

Questions 19 through 21 are asked for KL systems only.

- 19 Include DX20/RP20 disks (NO,YES,PROMPT):
- 20 Include CI20/HSC disks (NO,YES,PROMPT):
- 21 Include SA10/IBM disks (NO,YES,PROMPT):
- 22 Include TM02/TM03 magtapes (NO,YES,PROMPT):

Questions 23 through 25 are asked for KS systems only.

- 23 Include UNIBUS/LP20 printers (NO,YES,PROMPT):
- 24 Include UNIBUS/CD20 card readers (NO,YES,PROMPT):
- Local Terminal Configuration:
- 25 DZ-11 TTY lines (0-32):

Questions 26 through 53 are asked for KL systems only.

- 26 Include DX10/TX01/TX02 tapes (NO,YES,PROMPT):
- 27 Include DX20/TX02 tapes (NO,YES,PROMPT):

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- 28 Include TM78/TU78/TU79 magtapes (NO,YES,PROMPT):
- 29 Include TM10B magtapes (NO,YES,PROMPT):
- 30 Include TC10C magtapes (NO,YES,PROMPT):
- 31 Include SA10/IBM tapes (NO,YES,PROMPT):
- 32 Include BA10/LP100 printers (NO,YES,PROMPT):
- 33 Include CFE/LP20 printers (NO,YES,PROMPT):
- 34 Include XY10 plotters (NO,YES,PROMPT):
- 35 Include CR10 card readers (NO,YES,PROMPT):
- 36 Include CFE/CD20 card readers (NO,YES,PROMPT):
- 37 Include CP10/CP10D card punches (NO,YES,PROMPT):
- 38 Include PC04 paper tape punches (NO,YES,PROMPT):
- 39 Include PC04 paper tape readers (NO,YES,PROMPT):
- Types of DTE service to load:
- 40 Load ANF-10 DTE service (YES,NO):
- 41 Load IBMCOMM DTE service (YES,NO):
- 42 Load DECnet DTE service (YES,NO):

If you answer YES to Question 43, MONGEN asks Questions 44 through 53.
If you answer NO, MONGEN asks Question 44 then goes directly to Question 54.

- Local terminal configuration:
- 43 Configure old terminal scanners (NO,YES):

Question 44 is asked for each CPU.

- 44 How many RSX-20F TTYs on CPU (0,0-128):
- 45 How many DC10s on CPU (1,0-2):
- 46 How many DC68s on CPU (1,0-2):
- 47 How many DC76s on CPU (1,0-2):

Questions 48 through 50 are asked for each DC10.

- For DC10 n:
- 48 Number of DC10B 8 line data groups (1-8):
- 49 Number of DC10E Data set control groups (0-1):
- 50 Correspondance of DC10E lines to the DC10B lines (M-N,P):

Question 51 is asked for each DC68.

- For DC68 n:
- 51 Number of DC68 lines, including its console TTY (1-144):

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Questions 52 and 53 are asked for each DC76.

- For DC76 n:
- 52 To which DL10 port is the DC76 connected (0,1-7):
 - 53 Decimal lines on DC76 (1-129):
 - 54 OPR octal line (CTY,0-3):
 - 55 Data set lines
 - 56 Number of Jobs (1-511):
 - 57 Maximum pages of core for each job (0,0-16384):
 - 58 Total amount of system core in K (512-4096):

Question 59 is asked for KS systems only.

- 59 Clock ticks per second (60,50):

Question 60 is asked for KL systems only.

- 60 Number of real-time devices (0,0-77):
- 61 Allow jobs to be locked in core (YES,NO):
- 62 Guaranteed number of pages for unlocked jobs (0,0-16384):
- 63 Number of pages reserved for locking jobs in Exec Virtual Memory (10,0-?):
- 64 Number of high priority interrupt queues (0,0-15):
- 65 Meter (NO,YES):
- 66 KASER (NO,YES):
- 67 MPXSER (YES,NO):
- 68 PSISER (YES,NO):
- 69 IPCF (YES,NO):
- 70 ENQ/DEQ (YES,NO):
- 71 Disk sets (ALL):

If you are building a KL monitor and you answer Question 72 with YES, MONGEN asks Questions 73 through 86. Otherwise, MONGEN skips to Question 97.

If you are building a KS monitor and you answer Question 72 with YES, MONGEN asks Questions 87 through 96. Otherwise, MONGEN asks Question 89, then skips to Question 97.

- 72 Configure non-autoconfigured hardware (NO,YES):

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For KL systems only, Questions 73 through 86:

- 73 on CPU n:
DIS (NO,YES):
- 74 Type (VP10,340,VB10C):
- 75 Number of TD10S (0,0-2):
- 76 Number of units on DTn (1-8):
- 77 Number of DA28s (0,0-4):
- 78 Number of lines for TTY pool (8,0-512):
- 79 Number of DAS78s (0,0-8):
- For DAS78 n:
80 To which DL10 port is the DAS78 connected (0,0-7):
- 81 Decimal lines on the DAS78 (1-16):
- 82 Number of DN60s (0,0-7):
- For DN60 n:
83 To which port is the DN60 connected (0,0-7):
- 84 Decimal lines on the DN60 (1-12):
- 85 How many DC75NPs or DN87s on CPU n (0,0-8):
- For front end number 1:
86 To which DL10 port is the DC75 or DN87 connected (0,0-7):

For KS systems only, Questions 87 through 96:

- 87 Number of RX211s (0,0-2):
- 88 Number of units on RXx (1-2):
- 89 Number of KMC/DUP Lines (0,0-2):
- 90 Type of line for KDPn (ANF10,DECNET,USER,IBM):
- 91 Number of DMR11 Lines (0,0-8):
- 92 DMRn line type (ANF10,DECNET,USER,IBM):
- 93 DMRn switched line (YES,NO):
- 94 DMRn half duplex (YES,NO):
- 95 Is DMRn secondary (YES,NO):
- 96 Load IBM communications software (YES,NO):
- 97 Number of PTYs (20,1-505):
- 98 Network software (YES,NO):
- 99 Node name:
- 100 Number of remote TTYs (485,0-485):

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If you answer YES to Question 101, MONGEN asks Questions 102 through 114. If you answer NO, MONGEN skips to Question 115.

- 101 ANF-10 software (YES,NO):
- 102 Node name (node):
- 103 Node number of central site (1,1-77):
- 104 Remote terminals (YES,NO):
- 105 Virtual terminals (YES,NO):
- 106 Remote card readers (YES,NO):
- 107 Remote line printers (YES,NO):
- 108 Remote paper tape punches (NO,YES):
- 109 Remote paper tape readers (NO,YES):
- 110 Remote plotters (NO,YES):
- 111 Remote DN8x DDCMP devices (YES,NO):
- 112 Remote data entry terminals (YES,NO):
- 113 Remote task-to-task (YES,NO):
- 114 Number of connects (256,1-512):

If you answer YES to Question 115, MONGEN asks Questions 116 through 121. If you answer NO, MONGEN skips to Question 122.

- 115 DECnet software (YES,NO):
- 116 Node name (node):
- 117 Area number of central site (1,1-63):
- 118 Node number of central site (1,1-1023):
- 119 Router type (ROUTING,NONROUTING):
- 120 Transmit password (DECNET20):
- 121 Remote terminals (YES,NO):

If you answer Question 122 with YES, MONGEN asks Questions 123 through 125. If you answer 122 with NO, MONGEN skips to Question 126.

- 122 LAT software (YES,NO):
- 123 Node name (node):
- 124 Number of circuits (20,1-100):
- 125 Service groups:
- 126 Decimal "symbol,value":
- 127 Octal "symbol,value":
- 128 SIXBIT "symbol,value":

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- 129 Type "device-mnemonic,PI-channel" for special devices:
- 130 Type "device-mnemonic,PI-channel,no.-of-devices":
- 131 Type "device-mnemonic,PI-channel,highest-ac-to-save":
- 132 Type "ersatz-device,P,Pn,search-list-type":
- 133 Type "command-name,dispatch,flags,unique-bits,PRVTAB-name":

If you enter a terminal class in Question 134, MONGEN asks Questions 135 through 144. Otherwise, MONGEN skips to Question 147.

- 134 Terminal class:
- 135 Width (80,17-255):
- 136 Length (0,0-255):
- 137 Fill (0,0-3):
- 138 Characteristics:
- 139 Address of erase table (V100EP):
- 140 Address of rubout table (VTXXBP):
- 141 ANSI conformance level (1,0-15):
- 142 DEC conformance level (0,0-15):
- 143 Characteristic attributes:

If you do not enter a member terminal type in Question 144, MONGEN repeats Question 134. If you enter a member terminal type, MONGEN first asks Questions 145 and 146, then repeats Question 134.

- 144 Now enter member terminal types
Terminal type:
- 145 Additional attributes to set:
- 146 Attributes to clear:

If a class to extend is entered in Question 147, Questions 144 through 146 are repeated. If no class to extend is entered, MONGEN asks Question 148.

- Additional terminals for classes:
- 147 Class to extend:
- 148 System default terminal type (TTY):

This is the last question in the SYSGEN portion of the MONGEN dialogue. MONGEN responds with:

```
File DSK:SYSCNF.MAC Closed [SYSGEN finished]
```

The SYSGEN dialogue is finished when the source file is written to disk. Question 1 is repeated so that you may start the FGEN portion of the dialogue. If you wish to exit from MONGEN, type <CTRL/Z>.

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9.1.2.2 Running FGEN - The FGEN dialogue simplifies the task of choosing appropriate software from a wide selection. For example, FGEN allows you to select non-standard TOPS-10 features for a given application. In the dialogue, the software options are called "feature-test switches."

NOTE

Only the standard settings of the feature-test switches have been tested and are fully supported. Although installations may alter the settings of feature-test options, nonstandard option settings have not been tested and are not supported.

If you change the settings of the feature-test switches, you must then rebuild the monitor library file, TOPS10.REL. This procedure is documented in Appendix B.

After you select the FGEN portion of the dialogue, you may:

- o List the feature-test switches with their standard settings.
- o Request an explanation of the feature-test switch symbols.
- o Change the feature-test switch settings.
- o Add new feature-test switches.

The FGEN questions are listed below.

- 1 Which GEN (SYS,F):
- 2 Output (DSK:F.MAC):
- 3 Feature set (KL10,KS10):
- 4 Standard settings (YES,NO):

If you select the standard settings by answering Question 4 with YES, the FGEN portion of the dialogue is finished. If you answer Question 4 with NO, MONGEN prompts you with Question 5.

- 5 Feature:

To list a standard switch and its setting, type the name of the switch and press RETURN. For example:

```
Feature:KL10<RET>
Hardware options
FTKL10==:-1 ;KL10 support
```

To list all standard switches and their settings, type ALL and press RETURN. All standard switches and settings will be listed, grouped according to the following categories: hardware options, communications and network features, I/O features, scheduler features, UUC features, miscellaneous features, and customer defined features.

To change the value of a known switch, or to create a new switch, enter the name of the switch without the FT prefix, its value, and a comment if desired, separated by commas and press RETURN.

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Question 5 is the last question in the FGEN portion of the MONGEN dialogue. MONGEN responds with:

```
File DSK:F.MAC Closed
```

Question 1 is asked again. You may choose SYSGEN or FGEN, or type <CTRL/Z> to exit from MONGEN.

9.2 ASSEMBLING THE MONITOR

You must always assemble the following monitor source files:

```
COMMON.MAC  
COMDEV.MAC  
COMMOD.MAC
```

With the configuration source file:

```
SYSCNF.MAC
```

It is necessary to assemble the following universal files with them:

```
F.MAC  
S.MAC  
NETPRM.MAC  
DTEPRM.MAC (KL only)  
DEVPRM.MAC  
D36PAR.MAC
```

It is important that F.MAC precede S.MAC in the compiler commands, because S.MAC has conditional assemblies that depend on the contents of F.MAC. Use the following monitor commands to compile the monitor:

```
.COMPILE/COMPILE F,S<RET>  
MACRO: F  
MACRO: S
```

```
EXIT
```

```
.COMPILE/COMPILE DEVPRM,DTEPRM,NETPRM,D36PAR<RET>  
MACRO: DEVPRM  
MACRO: DTEPRM  
MACRO: NETPRM  
MACRO: D36PAR
```

```
EXIT
```

```
.COMPILE/COMPILE SYSCNF+<COMMON,COMDEV,COMMOD><RET>  
MACRO: COMMON  
MACRO: COMDEV  
MACRO: COMMODO
```

```
EXIT
```

If you are using a standard combination of feature-test switch settings and DIGITAL-supplied sources, you do not need to assemble the remainder of the bundled monitor modules. These modules have already been assembled and combined in a monitor library file named TOPS10.REL. TOPS10.REL must be located in the same disk area as that which you are using to build the monitor, before you can link and save the monitor.

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For KL installations, the TOPS10.REL library is in [10,7,MON,KL]. For KS installations, the TOPS10.REL library file is in [10,7,MON,KS].

If you are not using a standard combination of feature-test switch settings or if you have made changes to the monitor sources, you must assemble all the monitor sources, creating a new monitor library file. These procedures are explained in Appendix B.

9.3 LINKING AND SAVING THE MONITOR

The next step in building the monitor is to link the monitor modules. The LINK program used in the procedures that follow provides both a runnable monitor (SYSTEM.EXE), and several options for information you can receive about the linking process. This section lists only the commands that the LINK program requires to build the monitor. For full documentation on the LINK program, refer to the TOPS-10 Link Reference Manual.

The following sequence of instructions loads and saves a monitor for a standard KL or KS configuration with no unbundled software:

```
| .R LINK<RET>  
| *SYSTEM/SAVE/NOINITIAL/HASH:13K = /LOCALS -<CR>  
| #COMMON,COMDEV,COMMODO, TOPS10/SEARCH-<CR>  
| #/PATCH:200/COUNTERS/GO<CR>  
  
EXIT
```

NOTE

It is very important to leave a space on the command line after the /LOCALS switch. If a space is not left, the command line will not be accepted.

The file name SYSTEM is an arbitrary name chosen for the monitor; you can use any file name. However, the bootstrap program defaults to SYSTEM.EXE[1,4], so SYSTEM is a good choice for the file name.

To load unbundled software with the monitor, include the name of the relocatable file(s) in the command line after COMMODO. For SMP support use CPNSER.REL.

9.3.1 Copying the New Monitor to SYS:

Now copy your customized monitor to SYS so that it can be easily loaded by the bootstrap program. To copy your monitor to SYS, type the following monitor command:

```
.COPY SYS:=SYSTEM.EXE<RET>
```

After SYSTEM.EXE is in SYS, you can start your new monitor.

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9.4 BRINGING UP THE NEW MONITOR

Before you can load the new monitor, you must reload the system. To do this, you will shut down the current monitor, then reload the monitor. Use the GO startup option to start the monitor quickly without changing disk parameters. The following procedures show a quick startup for a KL and then for a KS. On both systems, SYS:TTY.INI and SYS:SYSJOB.INI were created previously.

Procedure for KL Systems

```
<CTRL/\>
PAR>SHUTDOWN<RET>
DECsystem-10 not running
[Dumping on DSKB:CRASH.EXE[1,4]]
[Loading from DSKB:SYSTEM.EXE[1,4]]

KL10 20-Jun-88
Why reload:NEW<RET>
Date:JUN-20-88<RET>
Time:18:36:12<RET>
Startup option: GO<RET>

KL10 18:36:41 CTY system 2996
Connected to Node CENTRA(0) Line # 25
.LOGIN 1,2
.R OPR
OPR>EXIT<RET>
.
```

Procedure for KS Systems

```
<CTRL/\>
KS10>HA<RET>

(Press the RESET and BOOT switches on the console at the same time.)

KS10 CSL.V#.#
BTAUTO
BOOT V#(##)

BOOT><RET>

KS10 11-Aug-88
Connected to Node CENTRA (0) Line # 17
Why reload:NEW<RET>
Date:AUG-11-88<RET>
Time:10:29:04<RET>

Startup option: GO<RET>

KS10 10:30:06 CTY system 4101
.LOGIN 1,2
.R OPR
OPR>EXIT<RET>
.
```

Next, you will create a bootable magnetic tape for your system.

BUILDING YOUR MONITOR

9.5 CREATING THE SYSTEM BOOTABLE TAPE

This section describes the procedure for creating a bootable magnetic tape for your system. The bootable tape is used to get your monitor running in the event of a disk failure that prevents booting from disk. You should rebuild the bootable tape every time you load a new monitor.

For KL systems, you can build the bootable tape using the instructions in Section 9.5.1. For KS systems, refer to Section 9.5.2. These procedures save the monitor as DSKB:SYSTEM.EXE[1,4].

9.5.1 Creating the KL System Bootable Tape

Use the following steps to create a bootable monitor tape for a KL system. Mount a magnetic tape that you will use for the bootable tape, ensuring that the write ring is on the tape. Tape drive MTA0 is used here.

```
.ASSIGN MTA0: BACKUP:<RET>  
.SET BLOCKSIZE BACKUP:512<RET>  
.REWIND BACKUP:<RET>  
.COPY BACKUP:=FEFILE.EXE<RET>  
.COPY BACKUP:=SYS:BACKUP.EXE<RET>
```

Then, copy your new monitor and all the system files to tape by typing:

```
.R BACKUP<RET>  
/SAVE DSKB:[1,4]=SYS:SYSTEM.EXE<RET>  
/SAVE DSKB:[1,4]=SYS:*.*,REL:*.*,UNV:*.*<RET>
```

9.5.2 Creating the KS System Bootable Tape

Use the following steps to create a bootable monitor tape for a KS system. Mount a tape that you will use for the bootable tape, ensuring that a write ring is included. Tape drive MTA0 is used here.

```
.ASSIGN MTA0: BACKUP:<RET>  
.SET BLOCKSIZE BACKUP:512<RET>  
.REWIND BACKUP:<RET>  
.COPY BACKUP:=T10KL.RAM<RET>  
.COPY BACKUP:=BOOT.RDI<RET>  
.COPY BACKUP:=SYS:BACKUP.EXE<RET>
```


BUILDING YOUR MONITOR

Then, copy your new monitor and all the system files to tape by typing:

```
.R BACKUP<RET>
/SAVE DSKB:[1,4]=SYS:SYSTEM.EXE<RET>
/SAVE DSKB:[1,4]=SYS:*.*, REL:*.*, UNV:*.*<RET>
```

9.6 AUTOMATING THE BUILD PROCEDURE

This section describes how to automate the build procedure. After you build the monitor through direct interaction, you can edit the distributed build files to tailor them to the characteristics of your installation. This section describes the files necessary to build a monitor, tells you where they are located and how to customize them and use them.

You can use the automated build procedure whenever the monitor must be rebuilt (to install patches, upgrade the monitor version, or to make changes to the configuration of the hardware and/or software). When you need to make changes to your monitor that require rebuilding it, follow the instructions in this chapter.

Before you submit the control files described in this section, start the GALAXY batch and spooling system as described in Chapter 10.

The following table lists each file and its function. An asterisk (*) appears next to files that require customization. The next section explains how to modify these files.

Some of the files pertain only to particular installations. Except where noted, all of the files below are on the Monitor/ANF-10 tape.

Table 9-1: Monitor Build Files

File	Function
BUILD.CTL	compiles the files in the build areas. These areas include the COMMON modules (COMMON, COMDEV, and COMMON). In addition, BUILD.CTL builds TOPS10.GLB and MON.EXE.
* BUILDS.DCL	contains command definitions.
* BUILDS.MIC	submits all the build control files.
* BUILDS.PTH	defines the build areas.
COMCTL.MIC	provides a template for the control file that COMPIL.MIC uses.
COMCTL.TEC	reads COMCTL.MIC to generate the control file that COMPIL.MIC uses.
COMPIL.CTL	builds TOPS10.REL.

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COMPIL.MIC	creates and submits a control file that compiles and lists a single monitor module.
* GEN.CTL	runs the MONGEN dialogues.
MPE.FIL	contains a list of MPE files to compile and the names of the directory areas for the .REL files. This file applies only to SMP sites. It is on the MPE or CPNSER tape.
START.CTL	performs the following operations in preparation for full recompilation of the monitor: <ul style="list-style-type: none">o Deletes all files from BASE: except *.MAC and *.MIC.o Creates the LINK.CCL and GLOB.MIC files.o Creates MPE.FIL, UNSUP.FIL, and DECNET.FIL if they do not already exist in the build area.o Uses the *.FIL files to create UNIV.CMD, TOPS10.CMD, and TOPS10.CCL in each FGGEN area.o Invokes TREE.TEC, and TOPS10.TEC.
NOTE	
Submit START.CTL whenever you install a new version of the monitor, an autopatch update to the monitor, or when you change the value of any previously defined feature test symbols from a universal file.	
* SWITCH.INI	includes switches, runs the version of PATH shipped with TOPS-10 Version 7.04, and sets defaults for the SUBMIT commands.
* TOPS10.FIL	contains a list of files to compile and the names of the directory areas for the .REL files.
TOPS10.TEC	creates the .CCL and .CMD files that COMPIL.CTL, BUILD.CTL, and UNIV.CTL use.
TREE.TEC	uses BUILDS.PTH and START.MIC to insure that FGGEN and BUILD areas exist and that they are empty. TREE.TEC deletes START.MIC when it completes this action.
* UNIV.CTL	recompiles all the universal files in selected areas, as defined by hard-wired paths.
UNSUP.FIL	contains a list of customer-supported modules to compile. This file applies only to sites with unsupported configurations. It is on the customer-supported tape.

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9.6.1 Customizing the Build Files

Some of the files for building the monitor can be used without alteration. However, the following files are only templates. You must modify them to build a monitor that reflects your installation. This section lists those files and explains how to customize them.

- o BUILDS.DCL

This file defines the PATH command to run SYS:PATH.EXE (as used in the supplied .MIC and .CTL files). This command must invoke the PATH program supplied on the 7.04 customer-supported CUSP tape. If this version of the PATH program is installed in SYS: you do not need to include this command definition.

- o BUILDS.MIC

This file submits COMPIL.CTL in each FGEN area, and BUILD.CTL in each build area. Edit it to use only your monitor areas.

- o BUILDS.PTH

This file consists of three sections, separated by the following string: !<*>! . Each section defines logical names for one of the following areas: library areas, FGEN areas, and monitor build areas.

1. LIBRARY AREAS

- BASE:

This name is required. Define it to point to the area used to edit any locally modified sources for building. The area should be the superior SFD (or UFD) of each of the FGEN areas defined in the second section of the file.

- CTLS:

This name is required. Define it to point to the files used in the build procedures (*.MIC, *.CTL, *.TEC, and *.FIL).

- LOGS:

This name is required. Define it to point to the area that stores all the batch log files.

- MON:

You must define this name, and specify the /SEARCH attribute. The /SEARCH attribute insures accessibility of the files required during the build procedure. It points to the distribution sources, and files used in the build procedures.

- SYS:, UNV:, REL:

These may not be required, but you must use the current version of MACRO and LINK to build the monitor.

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2. FGEN AREAS

The FGEN areas are used to build a TOPS10.REL file for linking monitors. There is one FGEN area for each FGEN dialogue you complete in MONGEN. Most installations need only one or two such areas: a KL area and a KS area.

3. MONITOR BUILD AREAS

The monitor build areas are used to build a MON.EXE for each system at an installation. Define these areas to be in SFDs subordinate to the appropriate FGEN areas. However, if there is only one build area corresponding to a given FGEN area, the two areas can point to the same SFD. For example, in the supplied prototype, S could be the same as KS.

Finally, the BUILDS.PTH file invokes the DECLARE program to define required monitor commands. This procedure also ensures that full directory scanning is enabled for the job.

It may not be necessary to define commands, but directory scanning is required for the job. The commands must be defined if the System Search List definition is not [1,4]. The automated build procedure requires that the PATH and MIC commands be defined, therefore those programs must exist in the build area if they are not in SYS.

o GEN.CTL

This file runs MONGEN for each FGEN and build area. Edit it to generate only the configurations in your monitor areas.

o SWITCH.INI

This file should be in the UFD corresponding to the BASE: area. Define it to run the version of PATH supplied on the 7.04 customer-supported CUSP tape and to process BUILDS.PTH. It should also set up appropriate defaults for SUBMIT commands.

o TOPS10.FIL

TOPS10.FIL contains a list of files to compile. For each file, it lists four optional fields of information in the following format:

<UNIV SPEC>|<COMPIL STRING>|<LIBRARY SPEC>|<AREA LIST>

1. UNIV SPEC

This field determines whether the file is a universal file, and consequently, whether its COMPIL STRING should be duplicated in UNIV.CMD.

2. COMPIL STRING

This field contains the command to give to COMPIL to get the file compiled. If the program is available as a .REL file (such as EDDT), leave this field blank.

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3. LIBRARY SPEC

This field contains the specification for the module to be included in TOPS10.REL. If this file should not be part of the monitor library file, leave this field blank.

4. AREA LIST

This field contains the list of FGEN and build areas for which the file should be compiled.

o UNIV.CTL

This file forces compilation of all monitor sources. It defines a path to each FGEN area to do this. Edit it to use your FGEN areas.

9.6.2 The Build Procedure

The following example shows the complete build procedure. The column to the left shows the commands that you type. The column to the right of the commands contains explanatory remarks.

<u>.SUBMIT START<RET></u>	
<u>.DO COMPILE MONGEN<RET></u>	Include this COMPILE command only if you have made changes to MONGEN.MAC.
<u>.SUBMIT UNIV<RET></u>	Include the SUBMIT UNIV command only if you have submitted START.
<u>.DO COMPILE modulename<RET></u>	Include DO COMPILE if you have made changes to a module. The module will be recompiled and a listing will be generated.
<u>.DO BUILDS<RET></u>	Compiles the monitor modules in the FGEN areas, and builds MON.EXE and TOPS10.GLB. If you have not changed the universal files, this is the only step you need to perform.

9.7 CUSTOMIZING BOOT

You can run the batch control file, BOOT.CTL, as distributed, to build BOOT after you have started GALAXY (refer to Chapter 10). The following command submits the control file for batch processing:

.SUBMIT BOOT.CTL<RET>

Or, before you bring up the monitor, you can perform the individual steps manually and modify the control file to eliminate the loading procedures for hardware that does not exist at your installation.

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For a KS system, you can modify the control file to include a step that creates binary files or a step to start EDDT.

For a KL system, you can modify the control file to include or exclude microcode for various hardware components, as well. This procedure allows you to save space in memory, because the monitor contains all the microcode available.

Section 9.7.1 describes the procedure for KL systems. Section 9.7.2 describes the procedure for KS systems.

9.7.1 Customizing the KL BOOT

To customize BOOT for your KL system, first enter the following command:

```
.COMPILE/COMPILE BOOT.MAC<RET>
```

The following output will appear on your terminal:

```
MACRO: BTSPRM
      BOOT
      [Assembling Boot for a KL10]
      [Including DX10/TX01 driver]
      [Including TM02 driver]
      [Including DX20/TX02 driver]
      [Including TM78 driver]
      EXIT
```

The files BTSPRM.UNV and BOOT.REL have been created. Next, run LINK to create BTONCE.EXE:

```
.R LINK<RET>
*BTONCE/SAVE=BOOT/LOCALS/SYMSEG:LOW,REL:EDDT/GO<RET>
EXIT
```

Now, you can run BTONCE and, by providing Y or N answers to the questions, include or exclude microcode for various hardware components. Running BTONCE creates BOOT.EXE and BOOT.EXB. The BTONCE questions are as follows:

```
..R BTONCE<RET>
Create binary output file [Y/N]:   Enter Y or N, then
Preserve EDDT and symbols [Y/N]:   press RETURN
Load DX10/TX01 microcode [Y/N]:
Load DX20/TX02 microcode [Y/N]:
Load DX20/RP20 microcode [Y/N]:
Load KLIPA/CI microcode [Y/N]:
Load KLNI/NI microcode [Y/N]:
```

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Lastly, run FILDDT to create a BOOT DDT that you can use to look at BOOT in the running monitor and examine problems that you might have with your BOOT procedure. The FILDDT prompt is File:. Enter the file name BTONCE followed by the switch /S, which directs FILDDT to load the symbol table from the file. After entering the file name and switch, press RETURN:

```
| .R FILDDT<RET>
| File:BTONCE/S<RET>
| [Extracting symbols from file DSKB:BTONCE.EXE[*.*]
| [1339 Symbols loaded from file]
| File:
```

Enter the switch /M at the File: prompt and press RETURN. The switch /M directs FILDDT to look at the running monitor. In the following discussion, note that \$ represents the escape character.

Next, enter the command string 1\$U, followed by RETURN. 1\$U provides FILDDT with the physical page number of the CPU's EPT (Executive Process Table). \$U is the command that sets the EPT page number in FILDDT; the EPT for CPU0 occupies physical page 1.

Then, enter the command string -1,-BTSVEC\$8U, followed by RETURN. Because it is unlikely that the location of the assembled symbol values will match the arbitrary location selected by the monitor for BOOT, the assembled values must be relocated. \$8U is the relocation command, and -1,-BTSVEC is the argument to that command.

To exit from FILDDT, enter <CTRL/Z>. Then save the BTDDT file it created.

```
| File:/M<RET>
| [Looking at the running monitor]
| 1$U<RET>
| -1,-BTSVEC$8U<RET>
| <CTRL/Z>
| .SAVE BTDDT<RET>
```

These commands create a new version of BOOT and a BTDDT that you can now load. The file must be loaded into each front-end on a multiple-processor KL system; repeat this procedure at the CTY of each processor in an SMP system. You must repeat the copying procedure every time you rebuild the front-end file system.

The following procedure shows how to load BOOT into the front-end for a single-processor KL system. It is assumed that the front-end file system resides on DSKB.

```
| .LOG 1,2<RET>
| .RUN Fll<RET>
| Fll>PUT DSKB:[5,5]=DSKB:BOOT.EXB[10,7,BOOT]<RET>
| [DSKB will be treated as RPA0]
| +- RPA0:[5,5]BOOT.EXB;4076=DSKB:BOOT.EXB/IMAGE
| Fll>EXIT<RET>
```

Now you can bring up your new monitor with the new BOOT.EXB file to control microcode loading by the front-end.

BUILDING YOUR MONITOR

9.7.2 Customizing the KS BOOT

To customize BOOT for your KS system, enter the following commands. These commands set the KS feature test switch to build BOOT for KS systems. Type CTRL/Z twice to exit from COMPILER:

```
.COMPILE/COMPILE TTY:+DSK:BOOT.MAC<RET>
```

```
MACRO:FTKL10==0<RET>
```

```
FTKS10==1<RET>
```

```
CTRL/Z
```

```
CTRL/Z
```

Next, run LINK and create KSONCE.EXE:

```
.R LINK<RET>
```

```
*KSONCE/SAVE=BOOT/LOCALS/SYMSEG:LOW,REL:EDDT/GO<RET>
```

```
EXIT
```

Now, you can modify the control file to include a step that creates binary output files and a step to start EDDT by running KSONCE. Include these functions by answering the following questions with YES:

```
.R KSONCE<RET>
```

```
Create binary output file [Y/N]: Enter Y or N, then
```

```
Preserve EDDT and symbols [Y/N]: press RETURN
```

To create KSBOOT.EXE from BOOT.EXE, type the following:

```
.RENAME KSBOOT.EXE=BOOT.EXE<RET>
```

Refer to Chapter 6 for the appropriate dialogue used to copy the file to the microprocessor file system.

CHAPTER 10
STARTING UP AND TAILORING THE GALAXY SYSTEM

After the TOPS-10 monitor is running, you can start the GALAXY batch and spooling system. GALAXY is a set of programs that controls the batch system, the operator interface, the output devices, and requests for the disk and tape units of the operating system. The components of the GALAXY system are:

Module	Function
ACTDAE	Accounting daemon
BATCON	Batch controller
CATLOG	Mountable device catalog daemon
CDRIVE	Card reader spooler
GLXLIB	Sharable GALAXY object-time system
LPTSPL	Line printer spooler
NEBULA	DQS Spooler
OPR	Operator interface
ORION	Operator interface controller
PLEASE	User-to-operator communications program
PULSAR	Tape and disk label processor
QUASAR	GALAXY queue manager and scheduler
QUEUE	User spooling and mount request program
SPRINT	Card reader interpreter

10.1 STARTING THE GALAXY SPOOLERS

Whenever the system is reloaded, the GALAXY spoolers must also be started. You can start the spoolers by typing commands to the OPR program, the operator interface for the GALAXY batch and spooling system. After reloading the system, type the following command to run OPR:

```
.R OPR<RET>  
OPR>
```

STARTING UP AND TAILORING THE GALAXY SYSTEM

OPR responds with its prompt, OPR>. To obtain a list of valid commands to the OPR program, type ?. To obtain a list of valid arguments to any command, type the command and a ?. To start the spoolers, type START:

```
OPR>START ? one of the following:
BATCH-STREAM      CARD-PUNCH      FAL-STREAM      NODE
NQC-STREAM        PAPER-TAPE-PUNCH  PLOTTER         PRINTER
READER
OPR>
```

In this example, the ? was typed to show the possible arguments to START. To start the new GALAXY system, use each of the arguments with the START command. For example, to start batch-stream 0:

```
OPR>START BATCH-STREAM 0<RET>
```

If you receive error messages indicating that certain objects do not exist, you may ignore them. The message shows that a certain configuration does not exist at your installation. Continue with the next command.

The spoolers can be started automatically by OPR if you include the above commands in the file SYS:SYSTEM.CMD.

You can ensure that the appropriate GALAXY files have been started by using the OPR>SHOW STATUS command.

The OPR program is described in the TOPS-10 Operator's Command Language Reference Manual.

10.2 TAILORING THE GALAXY SYSTEM

This section describes the procedure for tailoring the GALAXY system to the requirements of your installation. It describes the procedures necessary for running the GALGEN program, submitting the GALGEN batch job, and starting the GALAXY system with the new parameters.

It is only necessary to run GALGEN if you have made changes to GALAXY modules that are affected by GALGEN parameters, or if you wish to change the default parameters described in the GALGEN program. Note that DECnet Version 4 support is built into the distributed GALAXY programs; therefore, it is not necessary to run GALGEN to include DECnet support.

10.2.1 Running GALGEN

You can run GALGEN during the installation of GALAXY or after GALAXY is started.

The GALGEN program consists of a set of questions that allows you to change the standard configuration to match the hardware configuration of your installation. If your answers to all of the GALGEN questions match the default answers (shown in square brackets), it is not necessary for you to run the GALGEN program. The GALGEN dialog is shown below in the LONG format. Additional explanation is provided for some questions.

STARTING UP AND TAILORING THE GALAXY SYSTEM

You can save time and effort by building the GALAXY system in your own disk area. Copy GALGEN.EXE into your area before running it, and follow the procedure shown here:

.RUN GALGEN<RET>

GALGEN begins by printing the following:

GALGEN Version n(nnnn)

[Starting GALAXY Generation Procedure for TOPS-10 System]
[Writing GALAXY Configuration File DSKB:GALCNF.MAC[10,7]]

In the following dialog, all questions are of the form:

text of question (list or range of answers) [default answer]

The line starts with the actual text of the question. Following the question is a description of the possible answers enclosed in parentheses. This description might be a range of numbers, a list of keywords, or a textual description. Following this description is the default answer, enclosed in square brackets. The default will be assumed if you only press the RETURN key.

You have the choice of carrying on a LONG dialog in which an explanation of each question is provided automatically, or a SHORT dialog in which it is assumed that you are familiar with the GALAXY generation procedure. In either case, you can always obtain the help text by typing a question mark (?) in response to to any question.

Answer the following question with either LONG (for a long dialog) or SHORT (for a short one). Simply pressing the RETURN key will imply SHORT.

Dialog Length (SHORT, LONG) [SHORT]

Administrative Controls and Parameters

The questions in this section determine absolute GALAXY parameters, which cannot be overridden by user or operator commands.

The system logs all operator interactions in a disk file in the spooling area. Your answer to the following question specifies the name to be used for this file.

Operator log filename (3-6 Characters) [OPERAT]

You have the option of maintaining a backup master queue file which may be used in the unlikely event that the primary master queue file is destroyed.

STARTING UP AND TAILORING THE GALAXY SYSTEM

The backup file for the master queue file is useful if GALAXY or the master queue file is accidentally deleted or damaged. It records all the current queue jobs so that they will not be lost.

Do you want redundant master queue file (YES,NO) [NO]

Any permanently mounted structure may be used for the master queues. The structure that is first in the system search list is preferred.

The structure on which the master queue file is stored should be easily accessible by GALAXY. SSL is the acronym for System Search List. Unless you are running a private version of GALAXY, you should press RETURN for this question.

File structure to use for master queue (3-6 Characters) [SSL]

Users can specify a priority for their batch and spooling requests with the /PRIORITY switch. The allowable values for this parameter range between 1 (representing lowest priority) and 63 (representing the highest). The following two questions relate to this switch. The first question requests the maximum priority which may be specified by a non-privileged user.

Maximum priority non-privileged users may specify (1-63) [20]

You may specify the value to be used if the user does not specify a /PRIORITY switch. This value must be between 1 and the maximum that you specified in the previous question.

A queue request that is queued without the /PRIORITY switch must take a default priority. The value you specify here will be used as the default for such requests. The value must be between 1 and the maximum that you specified in the previous question. If you use 1 here, users will not be able to set some requests to a priority that is lower than the default. Therefore, it is recommended that the default that you specify here be greater than 1.

Default for /PRIORITY on batch and spooling requests (1-63) [10]

[SYSTEM]INFO Parameters

This section allows you to set any currently defined [SYSTEM]INFO control parameters.

The [SYSTEM]INFO facility, which allows users to manipulate PIDs for IPCF communication by symbolic names, is now part of QUASAR. While [SYSTEM]INFO normally limits the maximum length of a symbolic PID name via the GETTAB item %IPMPL (maximum packet length), you have the option of specifying the maximum length of a PID name allowable at all.

Maximum length of a PID name (29-79 Characters) [39]

STARTING UP AND TAILORING THE GALAXY SYSTEM

Applications

The following section determines which optional applications you wish to run on your system. These applications will be accessible through OPR, the operator interface program.

GALAXY supports by default the CATALOG, CONFIG, and QUOTA applications. If you wish to run additional applications (such as NCP), answer YES.

If you answer this question with NO, the Applications portion of GALGEN is completed.

Do you wish to run optional applications? (YES,NO) [YES]

The LAT Control Protocol (LCP) commands allow the operator or system administrator to control various aspects of Local Area Transport (LAT) service, and to display status and parameter settings information.

The LCP command subset is required if your monitor is built with Ethernet LAT terminal access enabled.

Include the LAT Control Protocol (LCP) commands? (YES,NO) [YES]

The Network Control Protocol (NCP) commands allow the system administrator to perform various DECnet network management functions.

The NCP command subset is required if you are running DECnet-10.

Include the DECnet Network Control Protocol (NCP) commands? (YES,NO) [YES]

You can include installation-developed applications with your answers to the following questions.

Do you wish to run any installation-developed applications? (YES,NO) [NO]

If you answer this question with YES, GALGEN asks the following questions:

Specify the name of the application. This name is used to access the application through OPR.

Application name or carriage return to exit (1-20 characters)

Each application must be associated with an application table name. This table file contains the command syntax parsing tree for the application. Specify only the file name.

Table name for application (1-6 characters)

The code to implement an application can exist either as a separate program (which communicates with users via ORION), or as an internal module within ORION itself.

Internal ORION application? (YES,NO) [NO]

STARTING UP AND TAILORING THE GALAXY SYSTEM

If you answer this question with YES, GALGEN asks the following question:

Please specify the name of the module containing the application-specific code. This module will be assembled and incorporated into ORION. You need only provide the file name. The extension of .MAC is assumed.

Application module name (1-6 characters)

Specify the name of the application. This name is used to access the application through OPR.

Application name or carriage return to exit (1-20 characters)

Batch Job Defaults

The questions in this section are used to define default values for the various options that a user can specify when submitting a batch job.

The batch user can specify a maximum runtime for his batch job using the /TIME switch. If he does not specify this switch the following default will be used:

Default batch job runtime limit (5-9999 seconds) [300]

Every batch job has maximum limits for each type of spooled output. These limits can be set by the batch user with appropriate switches to the SUBMIT command. If the user doesn't specify these switches, the following defaults will be used:

Line printer output limit (0-9999 pages) [200]
Card punch output limit (0-9999 cards) [1000]
Paper tape punch output limit (0-5000 feet) [200]
Plotter output limit (0-5000 minutes) [30]

The user can specify whether or not the batch log file should be printed after the job terminates by using the /OUTPUT switch to the SUBMIT command. The action is specified by: LOG to always print the log file, NOLOG to never print the log file, and ERROR to print the log file only if the job ended with an unhandled error. If the user doesn't specify this switch, the following value will be used.

Default for SUBMIT/OUTPUT (LOG,NOLOG,ERROR) [LOG]

The system provides for the enforcement of a maximum physical memory limit on batch jobs. The user can specify a maximum memory parameter and if any program attempts to exceed this limit, the batch job goes virtual.

STARTING UP AND TAILORING THE GALAXY SYSTEM

If you answer the following question with NO, the Batch Job Defaults section of GALGEN is completed.

Should memory limits be enforced (YES,NO) [YES]

The user can specify a maximum memory limit by using the /CORE switch. If this switch is not specified by the user, the following default will be used.

Memory limit (24-16384 pages) [512]

Line Printer Defaults and Parameters

The questions in this section are used to set default values for the line printer spooler.

Job banner pages are printed at the beginning of each print request. The user's name and any /NOTE value is printed on them.

Number of job banner pages (0-5) [2]

Job trailer pages are printed at the end of each print request. The user's name and any spooler checkpoint information is printed on them.

Number of job trailer pages (0-5) [2]

File header pages are printed before each file or copy in each print request. The file name is printed in BOLD letters on each header page.

Number of file header pages (0-5) [2]

The user can specify a special form for a print request with the /FORMS switch. If this switch is not specified the following default will be used.

Name for standard output forms (4-6 Characters) [NORMAL]

The number of characters that uniquely identify a form is compared with the current form name to determine if a forms change is required for a specific user request.

Number of characters which uniquely identifies form (2-6) [4]

The forms type that a user specifies when submitting a request is compared with the forms type currently mounted in the printer and the forms type recorded in SYS:LIFORM.INI and SYS:SPFORM.INI. Your answer to this question specifies the number of characters in the name of the forms type that qualify as a match.

There may be site-specific devices which require special device drivers loaded with LPTSPL as needed. For example, the LN01 laser printer requires the module LPTL01 in order for LPTSPL to load fonts as requested.

Do you want to load any special printer drivers? (YES,NO) [NO]

STARTING UP AND TAILORING THE GALAXY SYSTEM

If you answer this question with YES, GALGEN asks:

Each device driver must have its own module to be loaded with the LPTSPL main module. This module's .REL file must be found on the build areas when LPTSPL is loaded.

Name of device driver module (1-6 characters)
Any more special drivers to load (YES,NO) [NO]

Parameters for MDA -----

The questions in this section are used to set the default parameters for the Mountable Device Allocator (MDA).

The following question allows you to enable the deadlock avoidance code in MDA. This code prevents jobs from waiting for tape or disk resources that another job may already own, or that do not exist. Enabling the deadlock avoidance code causes MDA to use slightly more CPU time to insure that deadlocks will not occur.

Enable deadlock avoidance? (YES,NO) [YES]

You have the option of specifying which label type is the default.

NOTE:

Label type USER-EOT will allow a user program to see the end of tape condition on an UNLABELED tape only. All other label types will cause the user to block at end of tape while MDA automatically expands the volume set. In this case the user program will NOT see end of tape.

Default tape label type (ANSI,BYPASS,IBM,USER-EOT,UNLABELED)
[USER-EOT]

You have the option of specifying the default density at which tapes are read and written.

Default 9-track tape density (200,556,800,1600,6250) [1600]
Default 7-track tape density (200,556,800) [800]

You have the option of specifying the default track type on which to mount tapes.

Default track type (7,9) [9]

The system administrator can allow non-privileged users to bypass label processing.

Allow bypassing for non-privileged users? (YES,NO) [NO]

When mounting a labeled tape, a user can include the /LABEL-TYPE:BYPASS switch to specify that the tape label be ignored. If you want this function to be restricted to privileged users, answer NO to this question. If you want all users to be able to mount any tape regardless of the label type, answer YES to this question.

STARTING UP AND TAILORING THE GALAXY SYSTEM

Miscellaneous Defaults and Parameters

The questions in this section refer to general GALAXY parameters.

The following section establishes default bias and disk page to spooler unit conversion factors.

Do you want the standard limit computation (YES,NO) [YES]

This question refers to disk page conversion to spooler units. (Note that one disk page equals four disk blocks.) If you do not want this conversion, answer NO to the question. If you answer NO, GALGEN prints the following and prompts you for a value for each output device.

The default output limit of a spooled file is calculated as:

limit = disk blocks * units per disk block * copies

The output limit is expressed in pages for the printer, cards for the card punch, minutes for the plotter, and feet for the paper tape punch. The following questions establish the number of units of output per disk page.

Number of printed pages per disk block [.7]

Number of punched cards per disk block [8]

Minutes of plotter output per disk block [0.07]

Feet of paper tape per disk block [7]

The default action to be taken when output exceeds the specified limit for an output spooler may be to ABORT the job and ignore all remaining output, ASK the operator what to do, or PROCEED to finish processing the job.

Default output-limit-exceeded action (ABORT,ASK,PROCEED) [ASK]

If file access between network nodes is to be done, each FAL - file access listener - stream needs a network type associated with it. The network types supported are ANF-10 and DECnet.

Default network-type for FAL streams (ANF-10,DECnet) [ANF-10]

Galaxy-10 spoolers (object processors) are now grouped into three categories and are started (logged-in and run) by QUASAR at different times depending on which category they fall into. The three categories and their corresponding characteristics are:

%ONCE - "fired up" by QUASAR after QUASAR starts ORION, PULSAR, and CATLOG. The spooler will never logout on its own.

%STCMD - "fired up" by QUASAR when an OPR START command is issued for a stream controlled by the spooler. The spooler will logout when all streams under its control are shut down.

%DEMND - "fired up" by QUASAR when a job is in a queue that can be serviced by one of the spooler's job streams. These "demand" spoolers will logout after "n" minutes of idleness. You will be prompted below to define a value for "n".

STARTING UP AND TAILORING THE GALAXY SYSTEM

The PRCDAT macro in QSRMAC.MAC defines the category to which each supported object processor/spooler belongs.

Number of minutes "demand" spoolers tolerate idleness (5-60) [10]

Your site may wish to include additional symbols and values which are different from Digital's standard ones. By specifying these values here, you may further tailor GALAXY to your particular installation.

Do you wish to enter any site specific parameters? (YES,NO) [NO]

If you answer this question with YES, GALGEN prints the following:

The parameters are entered as lines of text in a form acceptable for assembly by MACRO-10. Valid examples are:

```
XP  SYMBOL,EXPRESSION ;comment
ND  SYMBOL,EXPRESSION ;comment
SYMBOL==EXPRESSION   ;comment
```

Where SYMBOL is a legal symbol name for MACRO-10, and EXPRESSION is any valid MACRO-10 expression consisting of symbols and/or constants. The comment is any arbitrary string beginning with a semicolon.

Enter site specific parameter text: (Empty line to end.)

[End of GALGEN Dialog]

When the dialog is finished, GALGEN writes the output file GALCNF.MAC into the disk area. Use this output file to configure your new GALAXY system.

10.2.2 Assembling the Tailored GALAXY System

Use the batch control file (GALAXY.CTL) provided to assemble the new GALAXY system. To submit a batch job, the GALAXY system and spoolers must be running. GALAXY is usually started at system startup from the SYSJOB.INI or OPR.ATO file. You should create one of these files, reload the system, and start the GALAXY spoolers (as described in Section 10.1).

The GALAXY components listed below should be started automatically whenever the system is reloaded. You can accomplish this by creating a file named SYSJOB.INI, and including the commands to start the components in that file. SYSJOB.INI is described in Chapter 12. The GALAXY components that must be started automatically whenever the system is reloaded are:

```
ACTDAE
QUASAR
```

The batch control file (GALAXY.CTL) that is included on the CUSP tape uses the GALCNF.MAC file to generate a GALAXY system. The batch job will generate the appropriate .EXE files for the GALAXY system. Copy the batch control file into your area and submit it from there.

STARTING UP AND TAILORING THE GALAXY SYSTEM

To start the batch job, type the monitor command and press RETURN:

```
.SUBMIT GALAXY/TIME/RESTART<RET>
```

If the batch job ends in an error, try to correct the control file, then delete the .LOG file and submit the control file again. If the error occurs again, consult a software specialist or system programmer.

NOTE

It is important that the batch job run successfully. Check the log file carefully to be sure that no warning (%) errors occurred. These errors do not end the job but may cause problems later.

When the batch job finishes successfully, a series of messages will be printed on the operator's terminal. One message will be printed for each component of the GALAXY system as it is created.

When the components are successfully created, they are ready to be copied into SYS. Note that the system should be stand-alone during this process because no users can submit requests during this procedure.

10.3 SHUTTING DOWN THE GALAXY SYSTEM

If a GALAXY system is already running, you must shut it down before replacing it with new GALAXY modules. Before shutting down the GALAXY system, you should obtain exclusive use of the operating system by scheduling stand-alone time for this purpose or by ending timesharing.

Using the OPR program, stop the GALAXY system. To run OPR, type the following command and press RETURN:

```
.R OPR<RET>  
OPR>
```

OPR responds with its prompt, OPR>. To obtain a list of valid commands to the OPR program, type ? at this point. To obtain a list of valid arguments to any command, type the command and a ?.

```
OPR>SHUTDOWN ? one of the following:  
BATCH-STREAM      CARD-PUNCH      FAL-STREAM      NODE  
NQC-STREAM        PAPER-TAPE-PUNCH  PLOTTER        PRINTER  
READER  
OPR>
```

In this example, a ? was typed to show all the possible arguments to the SHUTDOWN command. To stop all the components of the GALAXY system, type the SHUTDOWN command followed by the name of each component. For example:

```
OPR>SHUTDOWN BATCH-STREAM n<RET>  
OPR>SHUTDOWN CARD-PUNCH n<RET>  
.  
.  
OPR>SHUTDOWN PRINTER n<RET>  
OPR>SHUTDOWN READER n<RET>
```

STARTING UP AND TAILORING THE GALAXY SYSTEM

During this procedure, OPR may print the following message on your terminal:

```
--There are no devices started--
```

In this case, there were no devices on line for that component. You can ignore the message and go on to the next command.

After you shut down all the components, exit from OPR. Type EXIT and press RETURN:

```
OPR><u>EXIT</u><RET>
```

After returning to monitor level, use the SYSTAT monitor command to determine the jobs that are running for GALAXY. The GALAXY jobs may be named any or all of the following:

```
CDRIVE  
CATLOG  
NEBULA  
IBMSPL
```

Using the ATTACH command, attach to each job and log it out.

The GALAXY programs that are currently running must now be copied to a backup area from SYS. In the following example, they are copied to OLD ([1,3]).

```
| .COPY [1,3]=[1,4]CDRIVE.EXE,CATLOG.EXE,NEBULA.EXE,IBMSPL.EXE<RET>
```

You must also delete the master queue files. The master queue files can be deleted with the following command:

```
.DELETE SYS:QSRMS1.*<RET>
```

```
FILES DELETED:  
SYS:QSRMS1.QSR  
221 BLOCKS FREED
```

Now you can copy the new files to SYS and bring up the new GALAXY system.

STARTING UP AND TAILORING THE GALAXY SYSTEM

10.4 STARTING THE GALAXY SYSTEM

After you stop the old GALAXY system, you can start the new GALAXY system. The first step is to copy all the new GALAXY files into SYS. The new files will automatically supersede the old files in SYS. Use the COPY command to copy all the .EXE files from your area to SYS.

```
.COPY SYS:=*.EXE<RET>
```

You can start the GALAXY programs by reloading the system if the system has a file SYS:SYSJOB.INI that logs in the system programs. The SYSJOB.INI file is described in Chapter 12. To start the GALAXY programs manually, reload the system by typing CTRL/\ on the CTY and typing the SHUTDOWN command to the parser. Then reload the system, as demonstrated here:

```
<CTRL/\>
```

```
PAR>SHUTDOWN<RET>
```

```
DECsystem-10 not running
```

```
[Dumping on DSKB:CRASH.EXE[1,4]]
```

```
[Loading from DSK:SYSTEM.EXE[1,4]]
```

```
TOPS-10 704 Development mmm-dd-yy
```

```
Why reload:SCHED<RET>
```

```
Date:NOV-29-87<RET>
```

```
Time:17:55<RET>
```

```
Startup option:GO<RET>
```

```
TOPS-10 704 Development NOV-29-87
```

Now log in with the PPN [1,2] and start up the GALAXY spoolers by running the OPR program, as described in Section 10.1.

CHAPTER 11

MAINTAINING THE SYSTEM AUTHORIZATION FILE

The REACT program enables you to maintain the system authorization file, ACTDAE.SYS. This chapter describes how to use REACT commands to create, change, and delete user accounts. It also describes how to update the master accounting file, and enable account validation. To change user accounts with REACT, you must have administrative privileges (JP.ADM in JBTPRV).

The REACT Command Tables at the end of this chapter provide quick reference to the commands discussed in Sections 11.4 through 11.8.

11.1 CONVERTING OLD ACCOUNTING FILES

The REACT shipped with TOPS-10 Version 7.04 requires that you use the ACTDAE.SYS accounting file. If your system currently uses ACCT.SYS and AUXACC.SYS files, you can use a program called NEWACT to create the new accounting file, ACTDAE.SYS.

To convert ACCT.SYS and AUXACC.SYS files to the ACTDAE.SYS format, use the NEWACT program as shown below:

1. Run NEWACT.

NEWACT looks up the ACCT.SYS, AUXACC.SYS, and USERS.TXT files and uses the information in them to create the new ACTDAE.SYS file. If you do not want the information in USERS.TXT included in your new accounting file, delete the USERS.TXT file.

2. Copy the new ACTDAE.SYS file to SYS.

11.2 ENTERING AND EXITING REACT

The following examples show how to enter and exit the REACT program.

To enter REACT type the following:

```
.R REACT<RET>  
REACT>
```

To exit the REACT program and return to monitor command level, type EXIT and press RETURN:

```
REACT>EXIT<RET>
```

MAINTAINING THE SYSTEM AUTHORIZATION FILE

11.3 GETTING HELP WHILE USING REACT

There are three different ways to get help while using REACT: typing a question mark, typing HELP, and pressing the ESCape key.

For information about REACT top-level commands, you can type a question mark to display a list of the command keywords:

```
.R REACT<RET>
REACT>? one of the following:
CHANGE DELETE EXIT HELP INSERT LIST LOCK PURGE SELECT SHOW
UNLOCK VERIFY
```

If you type HELP and press return, REACT will print out a list of the commands and a brief description of each:

```
REACT>HELP<RET>
                                Help for REACT %33B(242)
CHANGE      Change profile entries
DELETE     Delete a profile
EXIT       Exit program
HELP       Gives information on commands
INSERT     Insert a profile into the accounting file
LIST       Write profile information to a file
LOCK       Lock accounting file against updates
PURGE     Purge expired profiles
SELECT     Select wildcarding criteria
SHOW      Display profile information on the terminal
UNLOCK     Unlock accounting file to allow updates
VERIFY     Verify the accounting file from a master file
```

If you type HELP and a command name, REACT provides a description of that command:

```
REACT>HELP CHANGE<RET>
                                Help for REACT %33B(242) - CHANGE
The CHANGE command enables you to enter user mode and modify user
profiles. The syntax is: CHANGE user-id
```

Once you have entered enough characters to uniquely identify a command, you may press the ESCape key. When you press the ESCape key, REACT completes the rest of the command name for you, and provides guidewords in parentheses to help you complete the command line. For example, if you type 'cha' and press the ESCape key:

```
REACT>cha<ESC>
REACT>change (user-id)
```

Table 11-2 provides a complete list of top-level commands and their functions.

When you are in user-mode, type a question mark to display commands:

```
REACT>CHANGE [27,150]<RET>
USER>? one of the following:
ACCESS-TYPES          CONTEXT-QUOTAS          CORE-LIMITS
DISTRIBUTION-LOCATION  ENQ-DEQ-QUOTA          EXPIRATION-DATE
IPCF-QUOTAS          LOGIN-TIMES            MAILING-ADDRESS
NAME                 PASSWORD                PERSONAL-NAME
PRIVILEGES           PROFILE-DEFAULT        PROGRAM-TO-RUN
REQUIREMENTS        SCHEDULAR-TYPE         SPOOLED-DEVICES
STRUCTURE-QUOTAS     WATCH-BITS
or one of the following:
DEFAULT  DONE      HELP      QUIT      RESTORE  SHOW
```

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In user-mode, you may ask for HELP on specific commands:

```
USER>HELP ACCESS-TYPES<RET>
```

ACCESS-TYPES specifies the types of access allowed to the specified user. ACCESS refers to any attempt by a user or in behalf of a user to gain access to the system using a correct combination of user-id and password.

You may also use the ESCape key when you are in user-mode. For example, if you type 'acc' and press the ESCape key:

```
USER>acc<ESC>  
USER>access-TYPES (allowed)
```

11.4 DISPLAYING USER ACCOUNT INFORMATION.

The SHOW command displays information about users listed in the accounting file. To display a user's profile, type the following:

```
REACT>SHOW user-id/switch<RET>
```

Where user-id can be the user name or PPN of an existing account profile. You may optionally include one of the following switches:

```
/DETAIL lists all user profile information (default)  
/FAST lists only the user-name and PPN
```

Characteristics of the profile that have not been changed from the default are designated by an asterisk at the beginning of the line. An example of a user profile is included in Section 11.5.2.

11.5 CREATING NEW ACCOUNTS

The INSERT command allows you to create new accounts, singly or in groups, and to define the attributes of the accounts you create. The attributes you define for a user's account make up the user's profile. You must specify a user-id when you use the INSERT command.

11.5.1 Creating Multiple Accounts with the Same Project Number

You can create a group of accounts with the same project number and different programmer numbers, using the INSERT command. To do this, you supply a wildcard character (*) for the programmer number.

The example below shows how to create a group of 5 accounts with the project number 25, programmer numbers 100 through 500, using the default profile, with names and passwords supplied by REACT.

```
.R REACT<RET>  
REACT>INSERT [25,*]<RET>  
Base programmer number: 100<RET>
```

Supply the first programmer number in the series you want to create.

```
Programmer number increment: 100<RET>
```


MAINTAINING THE SYSTEM AUTHORIZATION FILE

Supply the number to increment each programmer number. By selecting 100, the programmer number for the first account, n, will be 100; for the second account, n+100; for the third account n+100+100; and so on.

Count of PPNs to insert: 5<RET>

Supply the number of PPNs you wish to create.

Prompt for user's name? N<RET>

Respond YES if you want REACT to prompt you for the user name for each account you create. If you respond NO, REACT generates a user name for each account it generates in this series, but you may change the name later.

Prompt for password? N<RET>

Enter YES if you want REACT to prompt you for the password for each account you create. If you enter NO, REACT generates a random password for each account it creates in this series, but you may change the password later. REACT creates the accounts:

```
[READPL Default profile loaded: [%,%]]
User [25,100] 25,100 inserted with password GLAMDIRK
User [25,200] 25,200 inserted with password SNAKAIZ
User [25,300] 25,300 inserted with password RENGLYPCH
User [25,400] 25,400 inserted with password IZMOPWIQ
User [25,500] 25,500 inserted with password FILZNIKR
A total of 5 users inserted
REACT>
```

To SHOW the accounts you just created, type the SHOW command followed by the [project number, wildcard character]/SWITCH and press RETURN:

```
REACT>SHOW [25,*]/FAST<RET>
25,100 25,100
25,200 25,200
25,300 25,300
25,400 25,400
25,500 25,500
A total of 5 users listed
REACT>
```

11.5.2 Creating a Single New User Account

To create a single new user account, type INSERT, followed by the user-id. If you aren't sure which programmer numbers are available within a specific project number group, you can use the SHOW command combined with the switch /FAST to suppress profile information:

```
REACT>SHOW [27,*]/FAST<RET>
27,100 OLDUSER
27,200 VERYOLDUSER
27,300 ANCIENTUSER
A total of 3 users listed
REACT>
```

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When you create a new account, the user-id may be a user name or PPN. After entering the user name, you may supply an existing user-id for REACT to use as a model for the new profile. If you do not supply an existing user-id, REACT uses a default profile to establish initial values for the account attributes. The following examples use the name NEWUSER for the new-user-id, and, in the second example, OLDUSER for the existing-user-id:

```
REACT>INSERT NEWUSER<RET>
New user PPN: [27,150]<RET>
```

or

```
REACT>INSERT NEWUSER=OLDUSER<RET>
New user PPN: [27,150]<RET>
```

If the new-user-id has already been assigned, REACT prints an error message:

```
%REANAE Name NEWUSER is already taken by [P,PN]
REACT>
```

If the new-user-id is valid, but the PPN you have specified is already assigned, REACT prints an error message:

```
%REAPAE PPN [P,PN] is already taken by OTHERUSER
REACT>
```

If both the new-user-id and the PPN are valid, and if you have not supplied an existing user-id to use as a model, REACT uses a default profile to establish initial values for the account attributes. After either of these have been done, REACT enters user mode and you can make changes to any of the attributes that do not fit the requirements of the new user.

The following example shows how to create an account for user NEWUSER using the default profile:

```
REACT>INSERT NEWUSER<RET>
New user PPN: [27,150]<RET>
[READPL Default profile loaded:[27,%]]
USER>
```

To display the default profile attributes of NEWUSER's account, type the SHOW command and press RETURN at the USER> prompt:

```
USER>SHOW<RET>
PPN: [27,150]
User name: NEWUSER
Profile default: [27,%] or [%,%]
* Personal name: -none-
* Distribution location: -none-
* Mailing address: -none-
* Expiration date: -none-
* LOGIN times: Weekdays 0:23 Weekends 0:23
* Access types: Card reader, Network file access, Local, ANF
CTY, Dataset, Remote, Subjob of batch, Batch
* Requirements for LOGIN:
Account and remark strings are not required
Name is not required
Password under timesharing and batch
Password change at next LOGIN
Minimum password length: 6
Password change interval: Every 90 days
Password changes are allowed
```

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```
* Scheduler type: 0
* Program to run: -none-
* Context-quotas: Context 4, Total pages 512
* Core limits: Physical 512, Virtual 512
* ENQ/DEQ quota: 100
* IPCF quotas: Send 2, Receive 5, PIDs 2
* Privileges: Disk priority: 3, HPQ: 15, System operator,
ENQ-DEQ, IPCF, LOCK, METER, CPU, SPY-all-core, SPY-monitor,
Unspooling
* Spooled device bits: CDP, CDR, LPT, PLT, PTP
* Watch-bits: MTA
* Structure quotas:
Structure  Quota in  Quota out  Reserved  Status
-----  -
DSKB      80000      20000      0
DSKC      80000      20000      0
Administrative data:
Profile last changed by [27,300] at 29-Sep-87 14:33:20
Last access -never-
Last password change 29-Sep-87 14:33:20
```

Complete the insertion with the command DONE:

```
USER>DONE<RET>
User [27,150] newuser inserted with password poobah
A total of one user inserted
REACT>
```

To modify any of the attributes of NEWUSER's account, see the description of user-mode commands in the next section.

11.6 CHANGING ACCOUNTS

The CHANGE command allows you to modify the attributes of an existing user profile. Before you change a user's profile, you may want to display the profile to check the current values and settings. Use the SHOW command and supply a user-id to display a profile.

To modify user NEWUSER's profile, type CHANGE and the user-id or [P,PN] and press RETURN. After you have made changes, enter DONE and press RETURN. The following example shows how to change the expiration date of NEWUSER's account:

```
REACT>CHANGE [27,150]<RET>
USER>? one of the following:
ACCESS-TYPES          CONTEXT-QUOTAS        CORE-LIMITS
DISTRIBUTION-LOCATION  ENQ-DEQ-QUOTA        EXPIRATION DATE
IPCF-QUOTAS          LOGIN-TIMES          MAILING-ADDRESS
NAME                 PASSWORD             PERSONAL-NAME
PRIVILEGES           PROFILE-DEFAULT      PROGRAM-TO-RUN
REQUIREMENTS        SCHEDULAR-TYPE       SPOOLED-DEVICES
STRUCTURE-QUOTAS     WATCH-BITS
or one of the following:
DEFAULT  DONE  HELP  QUIT  RESTORE  SHOW
USER>EXPIRATION-DATE 31-DEC-89<RET>
USER>DONE<RET>
User [27,150] newuser changed
A total of one user changed
REACT>
```

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11.7 DELETING ACCOUNTS

The DELETE command removes a user account from ACTDAE.SYS. You can use wildcards in a PPN to delete multiple accounts. The following example deletes user NEWUSER's account.

```
REACT>SHOW NEWUSER/FAST<RET>
      27,150 NEWUSER
A total of one user listed
REACT>DELETE [27,150]<RET>
```

REACT responds with:

```
User [27,150] newuser, expiration date: 31-Dec-89
Are you sure?
```

This question prevents you from accidentally deleting accounts. You can respond to this question with NO, QUIT, SHOW, or YES. Use NO or QUIT if you do not want to delete the account. Use SHOW to display the profile (the question "Are you sure?" will be repeated). Type YES only if you want to delete the account. If you type YES, REACT prints the following messages:

```
Are you sure? YES<RET>
User [27,150] newuser deleted
A total of one user deleted.
REACT>
```

Use the SHOW command to check that you have deleted user NEWUSER's account.

```
REACT>SHOW NEWUSER<RET>
?REANSU No such user newuser
```

11.8 VERIFYING CHANGES TO ACCOUNTING FILES

To use the VERIFY command, you must first have a copy of ACTDAE.SYS in your disk area to use as a master accounting file. The default file name for this copy is MASTER.SYS. The VERIFY command is used to check for differences between the master file (MASTER.SYS) and the system file (ACTDAE.SYS), and to update MASTER.SYS to reflect valid changes that have been made to ACTDAE.SYS. You can list the differences between the two files and then decide whether or not you want REACT to update MASTER.SYS.

Before issuing the VERIFY command to REACT, you must lock ACTDAE.SYS. Issuing the LOCK command opens ACTDAE.SYS in read-only mode and prevents other users from making changes to it while you are updating the master file. To lock ACTDAE.SYS, type LOCK and press RETURN:

```
REACT>LOCK<RET>
[REALOK Accounting file locked; changes are prohibited]
REACT>
```

To use the VERIFY command, type the following command to REACT:

```
REACT>VERIFY master-file user-id/switch<RET>
```

You may include a user-id (user name or PPN) after the master-file name, to check only that user profile against the same user profile in ACTDAE.SYS. If you include a PPN, you can also use the wildcard character (*) to VERIFY a group of accounts.

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You may also include one or more of the following switches:

/REPORT	Lists the account attributes of user profiles that are different from those in the system file. This action is taken by default.
/NOREPORT	Does not list the account attributes of the user profiles that are different from the system file.
/UPDATE	Allows you to update the master file with changes from the system file. This is the default, but after listing the differences between the master file and the system file, REACT will ask whether or not you want to UPDATE the master file.
/NOUPDATE	Does not allow you to update the master file with changes from the system file.

To list differences throughout the entire master file, for all users:

```
REACT>VERIFY MASTER.SYS<RET>
```

```
Master file:          DSKC:MASTER.SYS[1,2]
Accounting file:     DSKA:ACTDAE.SYS[1,4]
Temporary file:     DSKC:039REA.TMP[1,2]
Verifying:          [*,*] /REPORT /UPDATE
```

REACT lists the profile information for any user profiles that are different from the system accounting file. This listing is identical to the display from the SHOW command, illustrated in Section 11.5.2. Then, to make sure you want to UPDATE the master file, REACT prints the following question:

```
Preserve changes?
```

You can respond with NO, QUIT, SHOW, or YES. If you want to delete the changes from your master file, type NO or QUIT. To display the changes, type SHOW. If you want to keep the changes, type YES.

Then, unlock ACTDAE.SYS:

```
REACT>UNLOCK<RET>
[REAUNL Accounting file unlocked; changes are permitted]
```

11.9 USING ACCOUNT VALIDATION

The USAGE file accounting system provides ASCII files containing data useful in billing users for system usage. The accounting daemon (the ACTDAE program) can provide validation of account strings when users log in, and write usage data in the USAGE files.

For details on the format of the USAGE file entries, refer to the TOPS-10/20 USAGE File Specification. The following sections describe the procedure for enabling account validation.

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To enable account validation, do the following:

1. Answer Y to Question 10 in the SYSGEN portion of MONGEN
2. Require account validation for LOGIN for each PPN in ACTDAE.SYS.
3. Create the account validation file PROJCT.ACT.
4. Run the program PROJCT.EXE to convert PROJCT.ACT into PROJCT.SYS.
5. Copy PROJCT.SYS into ersatz device SYS: (PPN is [1,4]).

11.9.1 CREATING THE PROJCT.ACT FILE

PROJCT.ACT is an ASCII file you can create to associate account strings with PPNs. The format of each line in PROJCT.ACT is:

```
[P,PN]=ACCOUNT1,ACCOUNT2,ACCOUNT3,...
```

You can use the * and ? wildcard characters in the PPNs. You can substitute the * for either the project number or programmer number, or both. You can substitute the ? for a single digit in the PPN.

For example, the PPN definition [27?,3007] would define account strings for [27n,3007], where 'n' equals any number from 0 to 7. The PPN definition [27,*] would define account strings for all programmer numbers with the project number 27, or [27,n] through [27,nnnnn].

A single PPN can be defined to accept any number of account strings, each of which is an ASCII sequence of up to 39 alphanumerical characters. The account strings must match user input (at LOGIN), exactly, including the casing of letters. If the account string definition in PROJCT.ACT is all uppercase, for example, the user must type the account string in all uppercase form.

You can allow the user to log in without typing an account string by defining a default account string for the PPN. Use the /DEFAULT switch after one of the account strings that is valid for the user's PPN. Then, when the user logs in, (s)he can simply press RETURN in response to the ACCOUNT: prompt. The session will be charged to the default account string. For example, the following account definition allows the user to default accounting data to the first account string in the definition (PUBLICATIONS):

```
[27,5434]=PUBLICATIONS/DEFAULT,MARKETING,MAINTENANCE
```

The PPN entries in the PROJCT.ACT file must occur in numerically ascending order. In the case of wildcard characters, the * is equivalent to 777777, and the ? is equivalent to a 7. In case of a conflict between a wildcarded number and an explicit number, the wildcarded PPN must follow the explicit PPN. For example, the following order is valid:

```
[10,10]=ABC  
[10,2370]=DEF,GHI  
[10,23??]=FOO  
[10,*]=GHI  
[*,*]=JKL
```

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Note that, under this scheme, the user with PPN [10,10] may not log in with account string JKL, because an explicit definition overrides any subsequent definitions. However, the user with PPN [10,2370] can log in with account string GHI, because any number of account strings can be valid for a single PPN.

Account strings can also contain wildcard characters. The * in the account string definition denotes account strings with any number of characters (or no characters) to replace it. However, when the ? is used to replace a character, it must be matched by a character. Therefore, the account string ABC??FG* can be matched only by account strings containing ABC for the first three characters, followed by any two characters, containing FG for the sixth and seventh characters, followed by no more or any number of characters.

11.9.2 CREATING THE PROJCT.EXE FILE

After you create PROJCT.ACT, and ensure that it exists in your directory path, run the PROJCT.EXE program as shown below:

```
.R PROJCT<RET>
```

```
END OF JOB  
EXIT
```

If an error occurs during processing the PROJCT.ACT file, PROJCT displays a message indicating the field or problem in the input file. Edit the PROJCT.ACT file to correct the problem, and run PROJCT again. When successful, PROJCT creates the PROJCT.SYS file. Copy this file into SYS:

When account validation has been enabled, the user will see an additional prompt in the LOGIN dialogue (ACCOUNT:), after the PASSWORD: prompt. See the TOPS-10 Operating System Commands Manual for more information.

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11.10 MAINTAINING LOGIN FAILURE RECORDS

REACT uses the FAILUR.LOG file to maintain records on login failures. All records in the FAILUR.LOG file are written in 7-bit ASCII, and vary in length. All validation failure entries have the same format for the first eleven fields. The following table explains the first eleven fields of the FAILUR.LOG file:

Table 11-1: FAILUR.LOG File Format

Field Number	Position	Data Type	Contents
1	001	Octal	Error code, as defined in ACTSYM
2	003	Decimal	Date and time, in same format as USAGE entries
3	017	Decimal	Job number of QUEUE./IPCF sender
4	020	Octal	PPN (left half) of above job
5	026	Octal	PPN (right half) of above job
6	032	ASCII	12 character name of above job
7	044	ASCII	6 character program name
8	050	ASCII	TTY name (for example, TTY45)
9	056	ASCII	Node name of job (ANF-10, DECnet, or LAT)
10	072	ASCII	Line name on above node
11	075	Octal	Asynchronous Port Characteristic (APC) code
The format for fields that end the Invalid account string (1) and Invalid password (6) error entries is shown below.			
12	077	Octal	PPN (left half) whose account string was invalid
13	083	Octal	PPN (right half) whose account string was invalid
The job not privileged entry (3) only contains the first 11 fields because the job number is already specified.			

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11.11 TOP-LEVEL REACT COMMANDS

The following table describes the basic action Commands for creating, changing, and deleting accounts. It also describes commands for updating the master accounting file and displaying user information.

Table 11-2: Top-level REACT Commands

Command	Function
CHANGE user-id	Enables you to enter user-mode and modify user profiles.
DELETE user-id/switch	Removes the specified account from ACTDAE.SYS. You can specify a wildcard in the user-id. Switches are: /ASK and /NOASK. If you specify /ASK, REACT prompts you to confirm each deletion you make. If you specify /NOASK, REACT does not prompt you to confirm each deletion. /ASK is the default.
EXIT	Exits the REACT program and returns you to monitor command level.
HELP	Displays information about REACT commands. To display a brief list of REACT top-level commands, type HELP and press RETURN. To get more information about a particular REACT command, type HELP and the command name.
INSERT user-id [=user-id]	Enables you to enter user-mode and create user accounts. You can supply an optional existing user-id to use as a guide for the new profile.
LIST user-id filespec/switch	Writes information from the specified user's profile to a file. You can specify a wildcard in the user-id. The default file specification is DSK:ACCT.LST[-]. Switches are: /DETAIL, which lists all the information in a user's profile, and /FAST, which lists only the PPN and its associated username. /DETAIL is the default.
LOCK	Opens ACTDAE.SYS in READ-ONLY mode, to prevent other users from making changes to the file while you update the master accounting file.
PURGE	Deletes expired profiles.

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SELECT	<p>Allows you to mark accounts that have certain profile attributes in common. You use the SELECT command to specify the attributes that you want as identifiers for the group. After you mark the accounts as a group, you can change various attributes of the profiles as a group, rather than doing so individually.</p> <p>For example, to extend the expiration date of all accounts that expire on December 31, you do the following: SELECT the accounts that have the expiration date you want to change, and CHANGE the expiration date to the desired date.</p>
SHOW user-id/switch	<p>Displays information from the specified user's profile. You can specify a wildcard in the user-id. Switches are: /DETAIL, which displays all the information in a user's profile, and /FAST, which displays only the PPN and its associated username. /DETAIL is the default.</p>
UNLOCK	<p>Reopens ACTDAE.SYS so that other users may access it.</p>
VERIFY [filespec] user-id/switch	<p>Checks for differences between a master accounting file (MASTER.SYS) and the system file (ACTDAE.SYS). You can specify a particular user account or verify all PPNs. This command allows you to list the differences between your master file and the system accounting file, and, optionally, update the master accounting file. The user-id can be either a [P,PN] or a user name. If the username includes characters other than A-Z, a-z, hyphen (-) or digits, you must enclose it in double quotes.</p>

11.12 USER-MODE COMMANDS

User-mode commands are subcommands to the CHANGE, INSERT, and SELECT commands, and consist of the following types of commands:

- o COMMANDS to perform the changes specified with Field Change Commands. These commands are listed in Table 11-2.
- o COMMANDS to change customer-defined fields that specify the customer-defined user account field that you want to change. You can define customer-defined FIELDS in REACTU.MAC to tailor the REACT program to the special needs of your installation.
- o COMMANDS to change account fields that specify the user account field that you want to change. These commands are listed in Table 11-3.

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The following prompt indicates that you have entered user mode:

```
USER>
```

The following table lists REACT Commands to change fields.

Table 11-3: REACT Field Change Commands

Command	Function
ALL	Allows you to specify all of the options for a given field change command.
AND	Allows you to specify selection criteria with the SELECT command.
ACCESS-TYPES	Specifies the types of access allowed to the specified user. An access is any attempt by a user, or in behalf of a user, to gain access to the system using a correct combination of user-id and password. ACCESS-TYPES include following: ANF-CTY, BATCH, DATA-SET, FILES-ONLY, LOCAL, NETWORK-FILE-ACCESS, PHYSICAL-CARD-READER, REMOTE, SUBJOB-OF-BATCH.
CONTEXT-QUOTAS	Specifies the limits governing the use of job contexts. The context quota is the number of contexts a user may have at any one time. Each logged in job has at least one (current) context. The maximum is 511. A quota of zero indicates no limit. The saved page quota is the number of pages of swapping space a user may occupy with idle contexts. A quota of zero indicates no limit. Refer to the description of job contexts in the <u>TOPS-10 Operating System Commands Manual</u> for more information.
CORE-LIMITS	Specifies a decimal value for the physical and virtual limit of the number of pages. The maximum number of physical pages is 8,192. The maximum number of virtual pages is 16,384.
DISTRIBUTION-LOCATION	Specifies text to be displayed on the banner page(s) of spooled output. The text indicates where the operator should distribute the user's output.
DONE	Writes the changes to the ACTDAE.SYS file.
ENQ-DEQ-QUOTA	Specifies a decimal value for the number of outstanding ENQ locks. The maximum number is 511.
EXPIRATION-DATE	Specifies the date and time when LOGINs to this account are no longer allowed.

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IPCF-QUOTAS Specifies a decimal value for the SEND, RECEIVE, and PID quotas. The maximum value for each quota is 511.

HELP Displays help text for the specified user-mode command.

LOGIN-TIMES Specifies the time of the day the user is allowed to LOGIN. Weekdays are divided into 24 one-hour segments. Weekends are divided into 12 two-hour segments. Therefore, if a user is permitted to LOGIN on Saturday at 7:00 AM, the user can actually LOGIN between 6:00 AM and 7:59 AM.

NAME Specifies the username for this profile. The username can consist of any printable character except the following: %, *, or / . It can be up to 39 characters long, and it cannot begin with a numeric character.

NO Allows you to specify options to field change commands

NONE Allows you to disallow all of the options to a given field change command.

NOT Allows you to specify selection criteria with the SELECT command.

OR Allows you to specify selection criteria with the SELECT command.

PASSWORD Specifies a password the user must type to gain access to the system. The password can consist of any printable characters, and can be up to 39 characters long.

PERSONAL-NAME Specifies a name other than the user's official accounting name (see NAME). The personal name, if available, is printed on the banner page(s) of a user's spooled output. This is an unprivileged entry in a profile, and as such may be modified by the user.

PPN Specifies the user's [project, programmer number]. The [P,PN] is the primary means of identifying a user.

PRIVILEGES Specifies the privileged functions allowed to the user. The privileged functions are: CPU, DISK-PRIORITY, ENQ-DEQ, HPQ, IPCF, LOCK, METER, MON-SPY, OPERATOR, POKE, RTTRP, SPY, TRPSET, UNSPOOL

PROGRAM-TO-RUN Specifies the file specification of the program to run after LOGIN is complete. The file specification may include a device name, program name, extension, and directory, including up to five levels of sub-file directories (SFD).

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PROHIBIT	Enables the system administrator to prevent users from changing their passwords. This is useful in situations where several people share a single PPN.
QUIT	Terminates the current user-mode command without executing that command.
REQUIREMENTS	Specifies additional information the user must supply when logging in. Options are: <ul style="list-style-type: none">o ACCOUNT-STRING information associated with the usero INTERVAL maximum time between password changeso LENGTH minimum characters for passwordo NAME under timesharing or batcho PASSWORD under timesharing or batcho PROHIBIT password changeso REMARK to be stored in the usage files
RESTORE	Deletes any changes you have made to a profile in the current user-mode session, and returns all attributes to their original values.
SCHEDULER-TYPE	Associates the specified user profile with a group that has been assigned a scheduler class. (See Appendix C for information about assigning scheduler classes.)
SHOW	Displays the current fields for the specified user profile.
SPOOLED-DEVICES	Specifies the physical devices not normally available to the user. The options are CDP, CDR, LPT, PTP, PLT and ALL.
STRUCTURE-QUOTAS	Specifies the structure on which the user has disk space allocated, and the amount of disk space allocated on the structure. LOGIN puts these structures in the user's search list, and sets either of the following two I/O status bits: READ-ONLY or NO-CREATE.
WATCH-BITS	Specifies any of the following watch bits that LOGIN sets: CONTEXTS, DAY, FILES, MTA, READ, RUN, VERSION, WAIT, WRITE. For more information, see the SET WATCH command in the <u>TOPS-10 Operating System Commands Manual</u> .

CHAPTER 12

CREATING SYSTEM INITIALIZATION FILES

There are several files that the monitor can use to help start up the system, initiate terminal communication, and provide information to the user. The files can be created by the system administrator. If they exist, the INITIA program reads them and passes the information stored in them to the monitor. The files INITIA can read are:

Filename	When
SYS:SYSJOB.INI	system startup
SYS:INITIA.TXT	the TEXT option is specified
SYS:NOTICE.TXT	the NOTICE option is specified
ALL:STR.TXT[1,4]	the STRUCTURES option is specified
SYS:TTY.INI	a terminal requests connection
DSK:SWITCH.INI[p,pn]	you log in
HLP:INITIA.HLP	HELP is requested

Users can also run INITIA from their terminals to set up terminal characteristics and display information about the terminal. The command options that direct INITIA to read these files are listed in Table 12-1, Special Processing Commands.

12.1 INITIA AT SYSTEM STARTUP

INITIA runs automatically at system startup. At system startup, it reads SYS:SYSJOB.INI, an optional system startup file created by the system administrator. You can prevent INITIA from running automatically at startup by using the NOINITIA startup option, as described in Appendix A. SYSJOB.INI contains the commands necessary to start up system programs that normally run in a detached state (that is, programs that do not normally require terminal I/O). Some of the system programs that may be started from SYSJOB.INI are ACTDAE, FILDAE, and QUASAR.

SYSJOB.INI allows you to start system components quickly and automatically. Most of the programs that can be started automatically by OPSER, from the OPR.ATO file, can be started more easily and efficiently by INITIA through SYSJOB.INI. SYSJOB.INI can contain monitor commands and commands to programs, but its intended purpose is as a system initialization file, and great care should be taken to ensure that the file can be read successfully.

INITIA also runs automatically whenever a terminal connects to the system. INITIA reads the file SYS:TTY.INI to establish information about the terminal. TTY.INI can also contain commands to INITIA to interrogate the connecting terminal to determine its characteristics and attributes.

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NOTE

INITIA cannot access files that are protected from it. Therefore, the system files SYSJOB.INI and TTY.INI must have a protection code of <155>. Protection codes are described in detail in the TOPS-10 Operating System Commands Manual.

12.1.1 The SYSJOB.INI File

If it exists, SYS:SYSJOB.INI is read by INITIA at system startup. TOPS-10 provides several system programs that are suitable for startup by INITIA from SYSJOB.INI. System programs commonly started from SYSJOB.INI are the system DAEMON programs DAEMON, FILDAE, ACTDAE; the GALAXY component QUASAR; user utilities such as MIC; the mail delivery program MX; and site-specific system programs. Any system program that normally runs in a detached state is a candidate for startup from SYSJOB.INI.

INITIA reads SYSJOB.INI and sends the commands contained in it to the monitor for special processing through the FRCLIN (force-line) mechanism. FRCLIN is an internal mechanism of the monitor that allows a privileged program to pass commands to the monitor as though the commands had been issued from a terminal. INITIA uses FRCLIN to start system programs because terminal input is handled by the monitor with a minimum of delay. After INITIA is finished, FRCLIN is free for use by other system components that must send commands to run programs.

System programs that may be started from SYSJOB.INI detect the FRCLIN mechanism and detach themselves automatically. To detect FRCLIN, a program must compare the number of the terminal line that sent the startup command with Word 162 (%CNFLN) of GETTAB Table 11 (.GTCNF), where the FRCLIN line number is stored.

The FRCLIN mechanism ignores output from the programs that are started with FRCLIN, and for that reason it may be difficult to determine why SYSJOB.INI fails to complete. To detect the reason for an error in SYSJOB.INI, set the DF.WFL bit in the monitor debugging word (DEBUGF), and restart INITIA. Output from the programs that are started will then be printed on the CTY.

12.1.1.1 Format of SYSJOB.INI - SYSJOB.INI is formatted as a list of the commands that can be sent through FRCLIN to the monitor. Any monitor commands can be placed in SYSJOB.INI, but the following are the most commonly used:

SET DEFAULT ACCOUNT string	Sets a default account string by which the jobs on FRCLIN can be logged in.
LOGIN	Logs in a job through FRCLIN to accommodate the program that is started on the next line of the file.

This command does not actually run the LOGIN program or use the LOGIN UUU. The monitor performs special logging-in actions to prepare a job for the program. The jobs are logged in under the PPN [1,2] by default.

CREATING SYSTEM INITIALIZATION FILES

NOTE

INITIA considers any program name given in SYSJOB.INI that starts with "LOG" to be a LOGIN command. This does not affect the content of the input, but it may cause conflicts, which the above technique attempts to prevent. To differentiate between LOGIN commands and other program names that begin with the letters LOG, use the following format:

R LOG...

If errors occur during processing, the rest of the input file may not be executed. Therefore, the order of the commands in SYSJOB.INI is vital to successful system startup. It is important to place monitor components first in the file, followed by CUSPS and other programs. You should place ACTDAE first in the file, to ensure that accounting is enabled when the rest of the programs are started. You may include commands to the programs you are starting. If you include commands, you must explicitly detach the program after the commands if the program does not detach itself as a result of the commands.

12.1.2 The TTY.INI File

Before a user can log in, the terminal must be logically connected to the system. When a terminal requests connection, INITIA reads the file SYS:TTY.INI to set up terminal and job characteristics. TTY.INI can contain commands to INITIA to:

- o Interrogate the connecting terminal to determine its characteristics and attributes.
- o Set terminal characteristics by explicit command.
- o Set options that specify information to be associated with the terminal.

NOTE

If you specified the ONCE startup option NOINITIA, users must issue either the INITIA CHECK command or SETTY command to activate the options in TTY.INI.

12.1.2.1 Format of TTY.INI - Each command line of TTY.INI, except continued lines, must begin with one of the terminal identifiers listed in Section 12.1.2.2. By using the terminal identifiers in combination with the options listed in Section 12.1.2.3 you can specify any number of terminals in a command line, and you may use any number of options for each terminal. If conflicting options are specified for a single terminal, the last option in the command line for that terminal takes effect.

To continue a command line, put a hyphen (-) as the last character of the line that is to be continued. To insert a comment, precede the comment by a semicolon (;) or an exclamation point (!). File line numbers are ignored. Multiple tabs and spaces are treated as one space.

CREATING SYSTEM INITIALIZATION FILES

The following is an example of a SYS:TTY.INI file:

```

ALL:                CHECK NORUN KSYS XONKOFF TEXT NOGAG LC-
                   REMOTE
APC:CTERM           NOCHECK
STOMP              ACCOUNT "MUMBLE"
CONNECT           COMET TTY0
KL1026_TTY405     NO REMOTE NO TABS
KL1026_TTY406     NO REMOTE NO TABS
KL1026_TTY407     NO REMOTE NO TABS
CTY:              TYPE:LA120 NO REMOTE NO TABS GALOPR ACCOUNT-
                   "MUMBLE"
KL1026_TTY5       RCV:9600 XMT:9600 NO REMOTE
KL1026_TTY6       RCV:300 XMT:300 REMOTE
KL1026_TTY405     TYPE:LA120 ;CPU2 CTY
KL1026_TTY406     TYPE:LA120 ;CPU1 CTY
KL1026_TTY407     TYPE:LA120 ;CPU0 CTY (when not THE CTY)
.
.
.

```

12.1.2.2 Specifying Terminal Lines - The following commands identify a terminal or set of terminals. This identifier is placed first in the command line, followed by the options that are listed in the next section.

Identifier	Terminal Lines Indicated
ALL:	All terminal lines.
APC:x	Asynchronous Port Characteristic. All terminals of APC type x where 'x' is determined by certain attributes and characteristics. This identifier can be one of the following: <ul style="list-style-type: none"> unknown hardwired dataset Gandalf TSN autodial Micom NRT (Network Remote Terminal) LAT (Local Area Terminal) CTERM (Command Terminal)
CTY:	The CTY (controlling terminal) only.
DETECT n	Dataset lines that are set to n baud.
LINSPD n	Lines that are set to n baud.
node_identifier	Terminal at the node called "node." The identifier following node_ can be any of the identifiers in this list.
OTHER	Any terminals not specified with a TTY: identifier.
OTHSPD n	All lines not set to n baud.

CREATING SYSTEM INITIALIZATION FILES

TTYnnn: Terminal line nnn. This identifier can be abbreviated to Tnnn:.

TTYnnn-zzz: All terminal lines from nnn to zzz. This identifier can be abbreviated to Tnnn-zzz:.

(TTYaaa:, TTYbbb:,...,TTYzzz:)
All terminal lines listed.

Terminal line numbers range from 0-777 octal. Hard-wired terminals are assigned permanent terminal line numbers in the form TTYnnn:, where 'nnn' is the physical line number. For example, if the terminal number TTY10: is assigned to a terminal that is hardwired to the system, that number will not change. If the host system is named MING, this terminal may also be referred to as MING_10.

Terminals connected through nodes have permanent line numbers in the form nnn_lll, where 'nnn' is the node name or number and 'lll' is the number of the line that connects the terminal to the node. When one of these remotely-connected terminals is recognized by the system, the monitor assigns a "terminal name" to it, in the form TTYnnn:, where 'nnn' is a temporary number assigned during the connection. These terminal names are reassigned on a dynamic basis, as terminals logically connect and disconnect from the system.

For example, terminal line 15 on node number 44, a terminal concentrator with node name XENON, would be called 44_15, or XENON_15, and this designation will not change. However, when terminal 44_15 is connected to the host system, it may be assigned terminal name TTY130: by the monitor. The terminal will be known to the monitor as TTY130: as long as it remains connected to the host system. If the terminal becomes disconnected and then reconnected, it might be assigned a different terminal name, such as TTY52:.

12.1.2.3 Specifying Terminal Options - Terminal identifiers are followed by options that specify information to be associated with the terminal(s) identified at the beginning of the command line.

There are three types of options:

- o Commands that specify special processing by INITIA.
- o Terminal characteristics to be set for the terminal when it is connected.
- o Programs to run automatically when the terminal is connected.

The options are separated by commas or spaces. For those options that require an argument, the argument can immediately follow the option name, or it can be separated from the option name by a colon or a space. Option names can be abbreviated, as long as the abbreviation is unique.

In conflicting situations, the option specified last in the command line takes precedence over those specified earlier. You can turn many options off by typing NO before the option word, with or without an intervening space. A minus sign has the same effect as NO. Thus, NO GAG, NOGAG, and -GAG have the same effect. In the table below, the complement of the command is shown, if a complement is valid. The default setting of the options is designated by (*).

CREATING SYSTEM INITIALIZATION FILES

The following table lists TTY.INI options to indicate special processing to be done for the terminal at initialization:

Table 12-1: Special Processing Commands

Option	Meaning
ATTRIBUTE	Display terminal attributes.
CHECK CHECK:DEFAULT	Interrogate terminal to determine its class, model and type, and set the attributes and characteristics associated with the class, model, and type found. When CHECK:default is specified, INITIA interrogates only if current terminal type matches the system default type specified in MONGEN. Complement: NOCHECK. NOCHECK is the default.
CONNECT	Connect networked terminal to the host.
HELP	Read the file HLP:INITIA.HLP and print information about the INITIA command.
KSYS	Display KSYS time if it has been set. Complement: NOKSYS. NOKSYS is the default.
LOCATE node	Make a logical connection with the specified node, similar to the monitor LOCATE command.
NAME	Print the system name. Complement: NONAME. NAME is the default.
NORUN	Suppress the running of programs that are set to run automatically for the terminal.
NOTICE	Print SYS:NOTICE.TXT, if such a file exists. Complement: NONOTICE. NONOTICE is the default.
SETTTY	Set terminal from TTY.INI (on CTY) or SWITCH.INI. If the job is logged in, NOSETTTY is the default. For more information about SETTTY and SETTTY options, see the <u>TOPS-10 Operating System Commands Manual</u> .
STOMP	Initiate the "terminal stomper" function that disconnects terminal lines that have been detached and idle for two or more minutes.
STRUCTURES	Print individual structure notes from ALL:STR.TXT[1,4]. Complement: NOSTRUCTURES. NOSTRUCTURES is the default.
TEXT	Print SYS:INITIA.TXT, if such a file exists. Complement: NOTEXT. NOTEXT is the default.
TTY	Display all terminal settings for this terminal. Complement: NOTTY. NOTTY is the default.
TTY:TTYnnn	Display all terminal settings for TTYnnn.

CREATING SYSTEM INITIALIZATION FILES

The following programs start automatically when INITIA runs for the terminal. A job is logged in for the program and INITIA creates a PPN for the job. Unless specified otherwise, INITIA constructs PPNs as follows:

- o If the terminal is a local terminal, INITIA uses [1,2].
- o If the terminal is remote, INITIA constructs a PPN using the algorithm [100+node-number,2]. For example, a terminal at the node that has node number 12 receives the PPN [112,2].

INITIA creates a job search list for the job, which it copies from the current setting of the system search list.

Table 12-2: Options to Run Programs

Option	Program
AUTOMATIC	<p>Start OPSER and begin processing an automatic startup file. The file name that is read depends on the terminal from which OPSER was started.</p> <p>When the terminal is connected directly to the local system:</p> <ul style="list-style-type: none">o If device OPR:, OPR.ATO is used.o Otherwise, TTYnnn.ATO is used, where 'nnn' is the terminal line number. <p>When the terminal is connected to a remote node:</p> <ul style="list-style-type: none">o If device OPR:, OPRnnn.ATO is used, where 'nnn' is the node number.o Otherwise, nnnlll.ATO is used, where 'nnn' is the node number and 'lll' is the terminal line number.
CHKPNT	Start CHKPNT under [1,2]. This program cannot be run from a remote terminal.
CRASH	Start FILEX under [10,1].
DAEMON	Start DAEMON under [1,2]. This program cannot be run from a remote terminal.
GALOPR	Start the OPR program, which begins processing the file SYS:SYSTEM.CMD, if the terminal is local. If the terminal is remote, SYS:nnnlll.CMD is used, where 'nnn' is the node number and 'lll' is the line number of the terminal where OPR is started.
OMOUNT	Start OMOUNT under [1,2]. This program cannot be run from a remote terminal. §

CREATING SYSTEM INITIALIZATION FILES

OPSER	Start OPSER.
STOMP	Initiate the "terminal stomper" function, which disconnects terminal lines that have been detached and idle for longer than two minutes.
SYSDPY	Start the SYSDPY display program for the appropriate terminal type.

12.1.2.4 Associated (Error) Messages - If there are errors in the TTY.INI file, INITIA prints:

?INTCER INITIA COMMAND ERROR

Correct the TTY.INI file and restart INITIA for the job. Any other ?INT... error message indicates a serious system problem that must be investigated by a software specialist.

12.1.3 The INITIA Monitor Command

The INITIA monitor command enables users to initialize their terminals at any time. To run INITIA from a terminal, use the INITIA monitor command. You may include the INITIA command and your choice of options in your SWITCH.INI file.

You can use INITIA to do the following:

- o Display terminal attribute settings, mode settings, and check terminal type.
- o Display the system banner and time of system shutdown (KSYS), if any.
- o Display general system notices.
- o Display operator notes about mounted structures.
- o Change terminal characteristics.

See the TOPS-10 Operating System Commands Manual for more information about the INITIA command and the SWITCH.INI file.

PART 5: SUPPLEMENTARY INFORMATION

This part is made up of four appendixes and a glossary. Appendixes A through D describe alternatives to the installation procedure and information for modifying the monitor software.

APPENDIX A
ONCE STARTUP OPTIONS

ONCE runs automatically at system startup. At system startup, the initial dialog questions allow you to provide a reason for the system reload and to specify the date and time. While the system is up and running, ONCE may also be run in user mode by running the monitor. You may refresh disks and change disk parameters when ONCE runs at system startup, or you may run ONCE in user mode without reloading the system.

ONCE performs the following functions:

- o Checks memory for units that are offline and confirms the state of the memory units by a response from you.
- o Checks the HOME blocks on all the units for inconsistencies and optionally rewrites the HOME blocks. If any units are write-protected, ONCE reports the unit name, asking whether it should be write-enabled or write-protected.
- o Reports on disk units that are offline.
- o Checks the BAT blocks, listing any inconsistencies for each unit.
- o Lists the number of bad regions on any unit you specify.
- o Lists each file structure and the units in the file structure in their logical order.
- o Lists all the disk units that are not in a file structure.
- o Lists the units in the Active Swapping List. For new installations, there is no swapping list, and ONCE prints a message to indicate that.
- o Lists the structures in the System Search List, or SSL.
- o Lists the structures in the System Dump List, or SDL.
- o Allows you to change parameters of any structure.
- o Allows you to change parameters of any unit.
- o Allows you to change any system disk parameters.
- o Allows you to dissolve file structures, if any file structures exist.
- o Allows you to define file structures.

ONCE STARTUP OPTIONS

- o Allows you to specify the units on which you want HOME blocks rewritten.
- o Lists the structures that need to be refreshed, and allows you to specify the structures that you want refreshed.
- o Allows you to log in as [1,2], after ONCE has refreshed structures.
- o Starts running the null job and begins timesharing.

The Disk Parameters Worksheet, Worksheet 3, is provided in Chapter 2 to record the disk parameters for your system. Because you can define so many disk parameters with ONCE, you may find it useful to record the disk parameters for your system on the worksheet and to use this as an aid when you refresh structures, create new file structures, or redefine disk parameters.

A.1 ONCE AT SYSTEM STARTUP

ONCE begins when you reload the system, as described in Section 9.4. First, the system name and the date that the monitor was created are displayed. The system name is set by Question 5 of the SYSGEN portion of MONGEN (see Chapter 9).

```
[Loading from DSKM:RL336A.EXE[1,4]]
```

```
RL336A DEC-10 Development 16-Feb-88
```

ONCE scans memory to be sure that it is accessible. Each monitor is built for a specific amount of memory. MONGEN Question 58 allows you to specify the amount of memory when you are building the monitor. Therefore, new installations may receive the following message, indicating that the default monitor was built to expect more memory than that which is currently online:

```
%Memory from xxxxxx to yyyyyy is offline  
Set memory (DOWN,OFFLIN,ONLINE) [OFFLIN]:
```

The default response appears in square brackets. If the memory indicated is not needed at this time, but will be needed later, press RETURN to accept the default answer. Memory that is set offline can be set online during system operation, with the SET MEMORY command. If all memory must be online, enter ONLINE and press RETURN. If the memory is not going to be required at all, enter DOWN and press RETURN. Memory that is down cannot be brought up with the SET MEMORY command.

If you are starting an SMP system and have not yet started the other CPUs, ONCE prints the following message:

```
%CPU #nnnn is not running. Set CPU status (DOWN,UP) [DOWN]:
```

If you have an SMP system, you can start the CPU indicated by entering UP and pressing RETURN. To accept the default value, just press RETURN. After receiving an answer, ONCE asks for a reason for reloading the system:

```
Why reload:
```

ONCE STARTUP OPTIONS

This question is asked whenever the system is reloaded. Several responses are allowed, depending on the reason for the reload. When you are installing the monitor, use one of the following answers:

NEW if you are installing a new system
SCHED if you are loading a new or different version of the
 monitor

When you are reloading the system after a problem or crash, use one of the following answers:

HALT if the system ended with a stopcode or HALT
HARDWARE if the system ended with a hardware malfunction
HUNG if the system would not respond
LOOP if the monitor was looping in executive mode
NXM if a non-existent memory stop occurred
OPR if an operator error occurred
PARITY if a memory parity error occurred
POWER if a power failure occurred
STATIC if static electricity caused the crash

When you are bringing the system up after a scheduled maintenance session, or for scheduled standalone time, use one of the following answers:

PM for preventative maintenance
CM for corrective maintenance
SA for scheduled stand-alone time

If none of the responses you see here apply, use the following:

OTHER followed by the reason for the reload

You can include comments to further describe your reasons by preceding the comment with a semicolon or a space. Your answer to this question is stored in the system error log file ERROR.SYS.

After receiving a reason for the reload, ONCE asks for the date:

Date:

Enter the date in the form:

DD-MMM-YY

or

MMM-DD-YY

Where DD is the numerical day of the month (01 through 31), MMM is the name of the month (JANUARY through DECEMBER) abbreviated as the first three letters of the month (JAN through DEC), and YY is replaced by the two digit year designation. The year is optional.

ONCE STARTUP OPTIONS

If you respond with an incorrectly formatted date, ONCE asks the question again in more detail:

Please type today's date as MMM-DD(-YY)

If you specify a date before the last system crash or before the creation date of the monitor, the ONCE dialog issues an error message, supplies the last crash or creation date, and asks you to verify your response:

%Specified date is prior to last crash.
Last crash date:MMM-DD-YY

or

%Specified date is prior to monitor creation date.
Creation date:MMM-DD-YY

and

Specified date:MMM-DD-YY
Is this correct? (Y or N)

To which you can respond Y if the date you typed was correct, or N, if you typed an incorrect date. If you enter N, the Date: prompt is reprinted so that you can enter the correct date.

ONCE asks for the time after it receives the date:

Time:

Enter the time based on a 24-hour clock. The seconds are optional, as are the colons separating the hours, minutes and seconds.

HH:MM:SS

or

HHMMSS

If the format of the time is incorrect, ONCE prints the following message:

Please type time as HHMMSS or HH:MM:SS

If you specify a time before the last system crash, the ONCE dialog issues an error message, supplies the last crash time, and asks you to verify your response:

%Specified time is prior to last crash.
Specified time:HH:MM:SS
Last crash time:HH:MM:SS

Is this correct? (Y or N)

If you enter N, the Time: prompt is reprinted so that you can enter the correct time.

As with the date, it is important that you enter the correct time. The system date and time can be changed with the CHANGE DATE startup option; the system time can be changed with the SET DAYTIME monitor command. However, changing either the system date or time during system operation may adversely affect operation. Therefore, it is recommended that you reload the system if you find it necessary to change them.

ONCE STARTUP OPTIONS

The ONCE program now prompts for a startup option.

Startup option:

ONCE provides several startup options. If you press RETURN without entering a startup option, you will be provided with a simple list of available options:

Startup option: <RET>

Options are: CHANGE DEFINE DESTRO DISSOL GO NOINIT
REFRES SHOW

If you type HELP and press RETURN you will be provided with a list of the startup options and switches and a brief explanation of each:

Startup option: HELP<RET>

Options are:

CHANGE - Change system parameters
DEFINE - Define structures and system lists
DESTRO - Dissolve all structures in the system
DISSOL - Dissolve a single structure
GO - Start timesharing
NOINIT - Start timesharing without system initialization
REFRES - Refresh selected structures
SHOW - Display system parameters

Switches are:

NOASL - Don't use reserved active swapping list
NOCOPY - Don't start CRSCP
NOPRIM - Start timesharing in secondary protocol
NOSDL - Don't use preserved system dump list
NOSSL - Don't use preserved system search list
NOVALI - Don't require account validation
STANDA - Start timesharing with SCHED10 set

Startup option:

A.2 RUNNING ONCE IN USER MODE

Running ONCE in user mode, by running the monitor, allows the operator to change disk parameters without reloading the system. To make changes to the disk file system, you must be logged in as [1,2].

.R monitor-name<RET>

Use scratch file (NO,YES) [default]:

The first question allows you to store the disk data base in a .BIN file. The use of the scratch file provides the novice user the opportunity to learn how to use ONCE without any chance of file system damage. If you are not logged in as [1,2], the default answer is YES and you must accept the default answer. If you are not logged in as [1,2] and you answer NO, you will be returned to monitor level:

? Must be [1,2]
.

ONCE STARTUP OPTIONS

If you are logged in as [1,2] the default is NO. Normally, you respond to this question by pressing RETURN. Then, you are prompted for units to read:

Read units:

Specify the name of each disk unit you wish to change and press RETURN. Your entry specifies the units from which ONCE will read the home blocks. You may specify a single unit, or ALL. When you have specified all the units to read, press RETURN.

Write units:

Specify the disk units on which to write new HOME blocks for changed information. The ONCE program ensures that you will not inadvertently disrupt system operation by not allowing you to change the disk parameters for disks that you did not specify as 'Write units'.

Startup option:

If you press RETURN without entering a startup option, you will be provided with a simple list of available options:

Startup option:<RET>

Options are: CHANGE DEFINE DISSOL EXIT REFRES SHOW

If you type HELP and press RETURN you will be provided with a list of the startup options and switches and a brief explanation of each:

Startup option:<HELP>

Options are:

CHANGE - Change system parameters
DEFINE - Define structures and system lists
DISSOL - Dissolve a single structure
EXIT - Return to monitor level
REFRES - Refresh selected structures
SHOW - Display system parameters

Switches are:

NOERRO - Re-write HOM blocks despite errors

Startup option:

A.3 STARTUP OPTIONS AND SWITCHES

ONCE allows you to change many disk and search list parameters, and performs disk refreshing and restructuring for maintenance purposes. Certain startup options, startup option keywords, and switches are valid only when ONCE runs at system startup (executive mode); others are valid only when running ONCE in user mode. In following sections, each startup option is described and an example of its use is provided.

ONCE STARTUP OPTIONS

When you select a startup option, the keywords applicable for that option are listed after the option in parentheses. For example, if you select the DEFINE startup option, the keywords valid for this option are listed after the option, in parentheses:

```
Startup option:DEFINE<RET>
Define (ASL,SDL,SSL,STRUCT):
```

If you are already familiar with the keywords available for a specific startup option, you may type the startup option and the keyword on the same line:

```
Startup option:DEFINE ASL<RET>

Enter names of units...
```

If you press RETURN without selecting a keyword you will be asked to specify a startup option again:

```
Startup option:DEFINE<RET>
Define (ASL,SDL,SSL,STRUCT):<RET>
```

Startup option:

The startup options and keywords, and the modes in which they are available, are listed and explained below. E denotes executive mode, and U denotes user mode.

Option	Mode	Effect
CHANGE	E,U	Use this option to change disk parameters. If you choose the CHANGE startup option when ONCE runs at system startup, the LOGIN command requires a PPN and password before you can log in a job.

Mode Valid Keywords

```
E,U ASL
E DATE
E NETWORK
E,U SDL
E,U SETS
E,U SSL
E,U STRUCTure
E,U UNIT
```

Section A.3.1 describes the CHANGE startup option.

DEFINE	E,U	Use this option to define structures and system lists. If you choose the DEFINE startup option when ONCE runs at system startup, the LOGIN command requires a PPN and password before you can log in a job.
--------	-----	---

Mode Valid keywords

```
E,U ASL
E,U SDL
E,U SSL
E,U STRUCTure.
```

Section A.3.2 describes the DEFINE startup option.

ONCE STARTUP OPTIONS

- DESTROY** E Use this option with extreme caution. The DESTROY option is used to refresh all structures and rewrite all HOME blocks. If you choose the DESTROY startup option, ONCE prints the following message on the CTY:
- To automatically log-in under [1,2] type "LOGIN"
- Then you can log in a job under the PPN [1,2] by simply typing LOGIN to the monitor prompt.
- Section A.3.3 describes the DESTROY startup option.
- DISSOLVE** E,U Use this option to dissolve a single specified file structure.
- Section A.3.4 describes the DISSOLVE startup option.
- EXIT** U Use this option to return to monitor level.
- Section A.3.5 describes the EXIT startup option.
- REFRESH** E,U Use this option to refresh a single specified file structure. If you choose the REFRESH startup option, ONCE prints the following message on the CTY:
- To automatically log-in under [1,2] type "LOGIN"
- Then you can log in a job under the PPN [1,2] by simply typing LOGIN to the monitor prompt.
- Section A.3.6 describes the REFRESH startup option.
- SHOW** E,U Use this option to display system parameters.
- Mode Valid keywords**
- E,U ASL
- E DATE
- E,U NETWORK
- E,U SDL
- E,U SETS
- E,U SSL
- E,U STRUCTure
- E,U UNIT
- Section A.3.7 describes the SHOW option.
- GO** E Use this option to start the monitor without any checking or dialog.
- Section A.3.8 describes the GO option.
- NOINITIA** E Use this option to start the monitor without initializing terminal lines. Because terminal lines are not initialized, this option should be used only when running the system stand-alone.
- Section A.3.9 describes the NOINITIA option.

ONCE STARTUP OPTIONS

The startup option can be followed by a number of switches to control the type of output to the CTY. The switches available in each mode are listed and explained below:

Switch	Mode	Effect
/NOASL	E	Use this switch to force the monitor to rebuild the Active Swapping List from disk after a reload. If you do not specify this switch, the monitor first tries to use the preserved copy in the Active Swapping List. If the monitor cannot use the preserved data, then it rebuilds the data from disk.
/NOCOPY	E	Use this switch to prevent CRSCPYPY from starting automatically when the monitor is started up. When a continuable stopcode occurs, CRSCPYPY copies the current crash file (SYS:CRASH.EXE) into a backup file in the XPN area.
/NOERRO	U	Use this switch to force the monitor to rewrite the HOME blocks.
/NOPRIMARY	E	Use this switch to start timesharing in secondary protocol. This switch is valid for KL10s only.
/NOSDL	E	Use this switch to force the monitor to rebuild the System Dump List from disk after a reload. If you do not specify this switch, the monitor first tries to use the preserved copy in the System Dump List. If the monitor cannot use the preserved data, then it rebuilds the data from disk.
/NOSSL	E	Use this switch to force the monitor to rebuild the System Search List from disk after a reload. If you do not specify this switch, the monitor first tries to use the preserved copy in the System Search List. If the monitor cannot use the preserved data, then it rebuilds the data from disk.
/NOVALIDATE	E	Use this switch to turn off account validation.
/STANDALONE	E	Use this switch to bring up the monitor as a stand-alone system.

A.3.1 CHANGing System Parameters

This section describes the CHANGE startup option. You must DEFINE the system lists and structures before you can CHANGE them. Section A.3.2 describes the DEFINE startup option and provides a complete description of the parameters that must be defined before they are changed.

In the following examples, the CHANGE startup option is selected first, followed by the item to change. The text that you type is underlined.

ONCE STARTUP OPTIONS

To CHANGE the Active Swapping List (E,U):

Enter the names of the units in the Active Swapping List. Enter an extra RETURN when the list is complete.

Startup option:CHANGE ASL<RET>

Enter names of units to appear in the active swapping list, one per line. Terminate list with a blank line.

RXxn<RET>

<RET>

Startup option:

To CHANGE the date (E):

Startup option:CHANGE DATE<RET>

Date:dd-mmm-yy<RET>

Time:hh:mm:ss<RET>

Startup option:

To CHANGE network information (E):

The network information is initially provided by your answers to the network questions in the MONGEN dialog.

Startup option:CHANGE NETWORK<RET>

System wide node name [name]:name<RET>

ANF-10 node name [name]:name<RET>

ANF-10 node number (1 - 77) [nn]:nn<RET>

DECnet node name [node name]:name<RET>

DECnet area number (1 - 63) [nn]:nn<RET>

DECnet node number (1 - 1023) [nnnn]:nnnn<RET>

LAT service name [name]:name<RET>

Startup option:

To CHANGE the System Dump List (E,U):

Enter the names of the structures in the System Dump List. Enter an extra RETURN when the list is complete.

Startup option:CHANGE SDL<RET>

Enter names of structures to appear in the system dump list, one per line. Terminate list with a blank line.

DSKx<RET>

<RET>

Startup option:

ONCE STARTUP OPTIONS

To CHANGE disk-set numbers (E,U):

Disk-set numbers are assigned within the DEFINE STRUCTURE startup option, and may also be changed within the CHANGE STRUCTURE startup option.

Startup option:CHANGE SETS<RET>

Enter the desired disk-set numbers (1 - 36) or "ALL" for all disk-sets, one per line. Terminate with a blank line.

ALL<RET>

<RET>

Startup Option:

To CHANGE the System Search List (E,U):

Startup option:CHANGE SSL<RET>

Enter names of structures to appear in the system search list, one per line. Terminate list with a blank line.

DSKx<RET>

<RET>

Startup option:

To CHANGE STRUCTURE parameters (E,U):

The CHANGE STRUCTURE startup option is used to change the parameters of an existing file structure. You can specify one structure to change only its parameters, or ALL to change all the structures.

In the questions that follow, any question preceded with an asterisk indicates changing that parameter will require the structure to be refreshed. A range of acceptable values, if applicable, is enclosed in parentheses. A default value, if any, is enclosed in square brackets. The ranges of acceptable values are calculated according to the structure type previously defined. The default values provided are those values which were previously defined. All ranges and default values used in the following example are used for illustration only. To accept a default value, just press RETURN.

Startup option:CHANGE STRUCT<RET>

Structure to change:DSKx<RET>

Change unit parameters for this structure (NO,YES) [NO]:

Do you want to see the BAT blocks (NO,YES) [NO]:

Parameters for structure DSKx

Structure name [DSKx]:

*Blocks per cluster (3 - 131071) [5]:

Private structure (NO,YES) [NO]:

Owner PPN (NONE,[p,pn]) [NONE]:

Disk-set (1 - 36,ALL,NONE) [ALL]:

*Number of K for CRASH.EXE (0 - 4096) [2048]:

Blocks allowed for overdraw per user (0 - 307800) [500]:

Consecutive blocks tried for on output (0 - 262143) [30]:

*Bits per cluster count (0 - 18) [12]:

Structure to change:

When you have finished changing one or all structures, you may enter another structure to CHANGE. If you wish to be prompted for another startup option, press RETURN.

ONCE STARTUP OPTIONS

To CHANGE Unit parameters (E,U):

The CHANGE UNIT startup option is used to change the unit parameters of an existing file structure.

Enter a unit to change and press RETURN. A range of acceptable values, if applicable, is enclosed in parentheses. A default value, if any, is enclosed in square brackets. To accept a default value, just press RETURN.

Startup option:CHANGE UNIT<RET>

Any question preceded with an asterisk indicates changing that parameter will require the structure to be refreshed.

Unit to change:RXxn<RET>

Parameters for unit RXxn

Unit ID [XXXXn]:

*SAT blocks per unit (5 - 81) [5]:

SAT blocks in core (1 - 5) [5]:

*K for swapping (0 - 21625) [20000]:

*First logical block for swapping (1400 - 705504) [352752]:

Swapping class (0 - 1) [0]:

Make this the only unit in the ASL (NO,YES) [NO]:

Unit to change:

When you have finished changing a unit, you may enter another unit to CHANGE. If you wish to be prompted for another startup option, press RETURN.

A.3.2 DEFINING Structures and System Lists

This section describes the DEFINE startup option. In the following examples, the DEFINE startup option is selected first, followed by the item to define. The text that you type is underlined.

To DEFINE the Active Swapping List (E,U):

The Active Swapping List is the list of units that the system will use to store data that is swapped to disk. The units in the Active Swapping List should have swapping space allocated on them: Make this allocation with the DEFINE STRUCTure startup option. To change the amount of swapping space allocated to the units in the list, select the CHANGE UNIT startup option. For the most efficient swapping, the units should be listed in the order of fastest to slowest accessibility.

The swapping list is divided into classes, where Class 0 is used first, then Class 1. All swapping units should be placed in Class 0, except units that have slow I/O. Be sure to include all or several controllers in the swap list. Use the DEFINE STRUCTure startup option to assign a unit to a swapping class. To change the swapping class of a unit, use the CHANGE UNIT startup option.

ONCE STARTUP OPTIONS

Enter the names of the units in the Active Swapping List. Enter an extra RETURN when the list is complete.

Startup option:DEFINE ASL<RET>

Enter names of units to appear in the active swapping list, one per line. Terminate list with a blank line.

RXxn<RET>
<RET>

Startup option:

To DEFINE the System Dump List (E,U):

Enter the names of the structures in the System Dump List. Enter an extra RETURN when the list is complete.

The System Dump List is the list of structures where the system will attempt to write the crash file whenever the system is halted. Space should be allocated on every structure in the System Dump List for the crash file. Make this allocation with the DEFINE STRUCTure startup option. To change the amount of space allocated for the crash file, select the CHANGE STRUCTure startup option.

Startup option:DEFINE SDL<RET>

Enter names of structures to appear in the system dump list, one per line. Terminate list with a blank line.

DSKx<RET>
<RET>

Startup option:

To DEFINE the System Search List (E,U):

Enter the name of each structure in the SSL, in the order in which the search list should be accessed. Type an extra RETURN when the list is complete.

The System Search List is a list of file structures, listed in the order that they will be searched whenever the ersatz device SYS: is specified or implied. The system CUSPs must be accessible through the System Search List.

Startup option:DEFINE SSL<RET>

Enter names of structures to appear in the system search list, one per line. Terminate list with a blank line.

DSKP<RET>
<RET>

Startup option:

To DEFINE a structure (E,U):

Enter the name of a structure to define and press RETURN. Then, enter the logical names of units within that structure.

Startup option:DEFINE STRUCT<RET>

In the following dialogue, all numbers are decimal unless otherwise indicated. Values within square brackets are defaults which will be substituted if RETURN is pressed.

ONCE STARTUP OPTIONS

Any question preceded with an asterisk indicates changing that parameter will require the structure to be refreshed.

*** Note ***

HOME blocks will be initialized immediately after all units in the structure have been entered.

Structure to define: DSKx<RET>

Disk drive for logical unit 0: RXxn<RET>

Disk drive for logical unit 1: <RET>

ONCE checks the BAT blocks for each unit. BAT blocks point to hardware errors on the disk pack. Two BAT blocks are written on the pack when it is formatted, and the system updates them when it finds blocks on the disk that cannot be read from or written to. The BAT blocks are first checked for consistency errors. They must be formatted properly, so that the system can read them. If inconsistencies are found in both blocks on the unit, they will be reported. If the first BAT block is all right, the second BAT block is not checked, because the second can be updated with a copy of the first.

You have the option of listing the bad regions pointed to by the BAT blocks. This information would be useful if only the first BAT block had a consistency error. If both BAT blocks are inconsistent, then this information would be useless. Therefore, if the first BAT block is inconsistent, but the second is consistent, and if the list of bad regions on the disk is lengthy, you should consider having the disk reformatted.

Do you want to see the bad regions (NO,YES) [NO]:

ONCE initializes the HOME blocks. Each disk pack contains two HOME blocks that contain pertinent information about the disk unit, such as the file structure it is in, swapping space that has been allocated on the unit, and the other unit-specific information that ONCE allows you to change.

[HOME blocks initialized on RXxn]

If you ask to see the bad regions, the bad regions will be listed by unit according to the format shown below:

```
% Unit RXxn bad blocks:
  First block No.   CPU   Cont   Unit   Error
  -----
```

You have the option of initializing the BAT blocks. Initialization rewrites the BAT blocks completely. All previous data about errors on the disk will be deleted and the BAT blocks will be filled in by the system as it attempts to read/write the disk. The BAT blocks should only be initialized if both have been reported to have inconsistencies, or if a disk channel has been erroneously reporting hard errors on the disk.

When the BAT blocks are rewritten, the old BAT blocks will be lost, and the information about bad areas on the disk will have to be rewritten into the new BAT blocks.

Initialize BAT blocks (NO,YES) [NO]:

ONCE STARTUP OPTIONS

If you answer YES, you will be informed that the action has been completed:

[BAT blocks initialized on RXxn]

Enter a value to specify the cluster size for the structure, or accept the default value by pressing RETURN.

The cluster size is critical to efficient use of the disk. A one-block data file requires 3 blocks on disk, including RIB, data block, and spare RIB. If a cluster size of 10 were assigned, 7 blocks would be wasted for this one-block file. The cluster size should not be set to less than 3, but the actual size depends upon the type of applications using the disk. The monitor requires a retrieval pointer for each cluster in the file it is accessing. Therefore, the cluster size should not be too small for the size of the average file. A large file with a small cluster size wastes monitor overhead.

The default value listed by ONCE is determined by the type of disk unit. The best value depends on the type of application using the disk, but the default is often appropriate.

Parameters for structure DSKx

*Blocks per cluster (3 - 262143) [10]:

Your next entry sets the privacy status of a structure. A private structure requires that users who wish to access it must use the MOUNT command to access that structure. A system structure is not private, and may be accessed by any user without explicitly mounting the structure for the job.

Private structure (NO,YES) [NO]:

A file structure need not have an owner PPN. However, if the owner PPN is set, the user with that PPN has full file access of the entire structure. Enter a PPN if you want to set or change the owner PPN of the structure. If you press return, the default value will be accepted and the current PPN will be cleared without replacing it.

The PPN may be wildcarded. Note that a PPN of [*,*] allows all users full access to all files on the structure.

Owner PPN [NONE]:

Disk-set (1-36,ALL,NONE) [ALL]:

If this structure will be included in the System Dump List, you must allocate space for the crash file. Enter a value to specify the amount of space to allow on the structure for a crash file. The crash file, CRASH.EXE, is the copy of memory that is written to disk automatically when the system crashes. This value should be at least the size of the maximum amount of memory used by your system. For RP20 and CI disks, however, this value should be 0.

*Number of K for CRASH.EXE (0 - 4096) [4096]:

Enter the number of blocks each user is allowed on the structure for overdraw purposes. The maximum allowable value is a variable that is dependant upon the type of disk unit.

ONCE STARTUP OPTIONS

When the system attempts to write a file for a user whose disk-space quota on the structure is not large enough to accommodate the whole file, a number of blocks over the quota can be allowed: this number is the "overdraw". When the user reaches the disk quota, the monitor does not allow new files to be created. It attempts to write the files that are open at the time quota was exceeded.

Blocks allowed for overdraw per user (0 - 307800) [500]:

Determine the number of consecutive blocks that the system will check for when searching for free space on disk to write files.

When the system attempts to write to disk, it tries to allocate a consecutive number of blocks that are free. You are allowed to specify this number. If the consecutive blocks are found, the file is written and the SAT block pointers are changed to reflect the change in free space. If the system cannot find a consecutive number of blocks of the size specified here, the file will be stored in the first free space, fragmented if necessary. Therefore, the value you give can affect the efficiency of file storage on the disk. It is recommended that you use a multiple of the cluster size. A number too small can result in fragmented disk files and excessive time spent in accessing files.

Consecutive blocks tried for on output 90 - 262143) [30]:

Enter the number of bits per cluster count, or press RETURN to accept the default.

*Bits per cluster count (0 - 18) [12]:

The system search list is a list of file structures, in the order that they will be searched whenever the ersatz device SYS: is specified or implied. The system CUSPs must be accessible through the system search list. Enter YES if you want this structure to be included in the SSL.

Make this the only structure in the SSL (NO,YES) [YES]:

The system dump list is the list of structures where the system will attempt to write the crash file whenever the system is halted. Space should be allocated on every structure in the system dump list for the crash file. Allocation for the crash file was made above.

Make this the only structure in the SDL (NO,YES) [YES]:

Specify a unit identification. This identification resides in the HOME blocks on the disk unit, for unique identification of the disk pack. Therefore, it should be a unique number that will never conflict with another code. Every pack should have a unit-id of six alphanumeric characters that may be a portion of the pack's serial number.

Parameters for unit RXxn
Unit ID [XXXXXn]:

Specify the number of SAT blocks on the unit. The default is calculated according to the type of disk unit. As a general rule, you should select the minimum number of SAT blocks, to reduce monitor overhead.

*SAT blocks per unit (8 - 81) [8]:

ONCE STARTUP OPTIONS

Enter the number of SAT blocks to be stored in memory for the unit. While the unit is mounted, the SAT blocks on the unit are stored in memory for fast access by the system. All of the SAT blocks should be stored in memory.

SAT blocks in core (1 - 8) [8]:

Specify the amount of swapping space allowed on the unit. The total allocated on all units should be at least 2 times memory size.

If enough space is not allowed, swapping space may run out during timesharing. The only way to expand the swapping space is to refresh the disk, which destroys all user files. If the unit is or will be in the system's Active Swapping List, you must allocate some space for swapping on the unit.

*K for swapping (0 - 4807) [4807]:

ONCE calculates the address of the first logical block where the system will attempt to write swapped data. This address appears as the default value. The default is usually appropriate, because the swapping space is put in the middle of the disk, to minimize the average seek time when accessing the swapping space. However, you may change this value.

*First logical block for swapping (33090 - 269332) [134672]:

The swapping list is divided into classes, where Class 0 is used first, then Class 1.

Swapping class (0 - 1) [0]:

The active swapping list is the list of units that the system will use to store data that is swapped to disk. If you wish to include this unit in the active swapping list, enter YES below:

Make this the only unit in the ASL (NO,YES) [YES]:

If you have changed any parameters marked with an asterisk, ONCE reminds you that the structure must be refreshed:

% Structure DSKx must be refreshed before it can be used.

Structure to define:

When you have finished defining a structure, you may enter another structure to DEFINE. If you wish to be prompted for another startup option, press RETURN.

ONCE STARTUP OPTIONS

A.3.3 DESTROYing All Structures

This section describes the DESTROY startup option. This option is available only in executive mode.

The DESTROY option is very powerful. If used with disks that already contain data or structure definitions, the data and structure information will be destroyed. The HOME and SAT blocks are initialized, deleting all information about the disk's place in system lists and file structures. For this reason, the ONCE program ensures that you want to select the DESTROY option by printing a warning message before accepting the DESTROY startup option. This warning is intended to prevent accidental destruction of disk data.

```
%WARNING: All structures will be refreshed. All disk files
will be destroyed. All information on currently spinning packs
will be lost. Do not proceed unless you are positive that you
want to do this.
```

```
Proceed (NO,YES) [NO]:
```

If you type NO or press RETURN in response to this question, ONCE will prompt you for another startup option.

If you type YES and press RETURN, the disks will be refreshed. When ONCE is finished with that operation, it prints the following message:

```
[HOME blocks initialized on all units]
```

You are then prompted for another startup option.

A.3.4 DISSOLving a Single Structure

This section describes the DISSOLVE startup option. The DISSOLVE option is available in executive and user modes.

In the following example, the DISSOLVE startup option is selected first, followed by the structure to dissolve. The text that you type is underlined.

A file structure is dissolved by deleting all reference to that file structure on the unit. The units in that structure will not be listed as part of any file structure until you define a file structure as containing those units.

```
Startup option:DISSOLVE<RET>
Structure to dissolve:DSKx<RET>
All data will be destroyed. Are you sure (NO,YES) [NO]:YES<RET>
Structure to dissolve:
```

Enter another structure to dissolve or press RETURN to select another startup option.

ONCE STARTUP OPTIONS

A.3.5 EXITing to Monitor Level

This section illustrates the EXIT startup option. EXIT returns you to monitor level.

You may EXIT only when running ONCE in user mode.

Startup option:EXIT<RET>

A.3.6 GO Option

This section describes the GO startup option. This option is available only in executive mode.

Startup option:GO<RET>

The GO option allows you to start up the monitor without changing any disk parameters. INITIA is allowed to run, but offline disk units are not checked for or reported. Because the GO startup option starts INITIA, one of the following files must exist:

SYS:TTY.INI to set up terminal line characteristics.

SYS:OPR.ATO to be read by OPSEER automatically.

INITIA first attempts to read TTY.INI. If the file does not exist in SYS, it runs OPSEER, which attempts to read OPR.ATO. If OPR.ATO does not exist, OPSEER prints an error message. You can exit from OPSEER typing CTRL/C and continue.

If TTY.INI exists, then INITIA follows the instructions in TTY.INI. The following example assumes that TTY.INI exists, and contains the line:

```
CTY      GALOPR
```

INITIA reads the line, and starts OPR on the CTY, where the commands are entered. INITIA reads SYS:SYSJOB.INI, starting the system programs, and then waits for input. Type the EXIT command to exit from OPR:

```
MONITOR FEB-16-88
Why reload:OTHER ;TEST<RET>
Date: FEB-20-88<RET>
Time: 11:35<RET>
```

Startup option: GO<RET>

```
MONITOR 11:35:32 CTY system 1026
Connected to Node CENTR(0) Line # 45
.LOGIN 1,2
.R OPR
OPR>EXIT<RET>
```

ONCE STARTUP OPTIONS

A.3.7 NOINITIA Option

This section describes the NOINITIA startup option. This option is available only in executive mode.

You can start up the monitor without running INITIA to initialize the terminal lines by using the NOINITIA option. Note that this also prevents INITIA from reading the SYSJOB.INI file as well. The SYSJOB.INI file is described in Chapter 10.

The NOINITIA startup option is identical to the GO option, except that it prevents the INITIA program from running. Therefore, it is a quick way to start the monitor without changing any disk parameters. However, the NOINITIA option should not be used to start timesharing because INITIA is required to initialize terminal lines. INITIA can be run later from the CTY using the INITIA SYS monitor command. See Chapter 10 for more information about INITIA.

```
TOPS-10 7.04 system FEB-16-88
Why reload:OTHER;TEST<RET>
Date:FEB-16-88<RET>
Time:11:44<RET>
```

```
Startup option: NOINITIA<RET>
```

After entering NOINITIA and pressing RETURN, ONCE checks for offline disk units and lists them. However, you are not allowed to change them.

```
%UNIT-NAME is offline
```

```
TOPS-10 7.04 system FEB-16-88
```

A.3.8 REFRESHing Selected Structures

This section describes the REFRESH startup option. In the following example, the REFRESH startup option is selected first, followed by the structure to refresh. The text that you type is underlined.

Structures may be refreshed in executive and user modes.

WARNING

When you refresh a file structure you destroy all data on the structure. Therefore, ONCE attempts to make absolutely certain that you intend to refresh the structure before doing so.

ONCE STARTUP OPTIONS

The REFRESH option forces a refresh procedure to initialize characteristics that require refreshing. When you select the REFRESH startup option, the HOME blocks of all units are checked to determine which file structures need to be refreshed. Then, you are asked to enter the name of a file structure to be refreshed. After refreshing, you will again be asked for the name of a file structure to be refreshed. If you press RETURN without providing the name of a file structure, you will be prompted to enter another startup option.

```
Startup option:REFRESH<RET>
Structure to refresh:DSKx<RET>
Structure does not need refreshing.
Are you sure (NO,YES) [NO]:NO<RET>
Structure to refresh:<RET>
```

Startup option:

Enter another structure to refresh or press RETURN.

A.3.9 SHOWing System Parameters

This section describes the SHOW startup option. In the following examples, the SHOW startup option is selected first, followed by the item to show. The text that you type is underlined.

To SHOW the Active Swapping List (E,U):

```
Startup option:SHOW ASL<RET>
```

Swapping units:

Unit	UnitID	Class	Space (K)
RPA0	DSKD0	0	4807
RPA6	KLAD0	0	4807
RPB4	DSKP0	0	20000

(Memory size = 2048K)

Startup option:

The Active Swapping List is the list of units that the system will use to store data that is swapped to disk. The swapping list is divided into classes, where Class 0 is used first, then Class 1, Class 2, and so on.

To SHOW the date (E):

```
Startup option:SHOW DATE<RET>
Thursday 4-Feb-88 :27:58
```

Startup option:

To SHOW networks (E,U):

```
Startup option:SHOW NETWORK<RET>
```

Networks:

```
System-wide node name: DEC10
ANF-10 node DEC10(10)
DECnet node DEC10(7.169)
LAT service: DEC10
```

Startup option:

ONCE STARTUP OPTIONS

To SHOW the System Dump List (E,U):

Startup option: SHOW SDL<RET>
System dump list: DSKD, DSKP

Startup option:

To SHOW the System Search List (E,U):

Startup option: SHOW SSL<RET>

System search list:

Structure	Position
-----	-----
DSKD	0

Startup option:

To SHOW disk sets (E,U):

Startup option: SHOW SETS<RET>
Disk sets: 2, 6, 11, 26

Startup option:

To SHOW a structure (E,U):

Enter a structure to SHOW. If you enter ALL, ONCE lists the parameters for all the structures that are online and repeats the question so that you can SHOW parameters for another structure. When you enter a structure to show, you are provided with a list of parameters for that structure or structures. This listing can be useful if you wish to change the parameters of a file structure. If you do not wish to SHOW a structure, press RETURN and you will be prompted for another startup option.

Startup option: SHOW STRUCT<RET>
Structure: DSKD<RET>

Parameters for structure DSKD

*Blocks per cluster: 10
Private structure: NO
Owner PPN: [10,56]
Disk-set: ALL
*Number of K for CRASH.EXE: 4096
Blocks allowed for overdraw per user: 500
Consecutive blocks tried for on output: 0
*Bits per cluster count: 15
Position in the SSL: 0
Unit in the SDL: YES

Structure: <RET>

Startup option:

ONCE STARTUP OPTIONS

To SHOW a unit (E,U):

Enter a unit to SHOW. When you enter a unit to show, you are provided with a list of the parameters of any disk unit or all disk units. This listing is useful when changing the parameters of a disk unit. If you type ALL, parameters of all of the disk units will be listed. If you specify a unit, ONCE lists the unit parameters and then repeats the question so you can SHOW another unit. If you do not wish to SHOW a unit, press RETURN and you will be prompted for another startup option.

Startup option: SHOW UNIT<RET>

Unit: RPA0<RET>

Parameters for unit RPA0

Unit ID: DSKD0

*K for swapping: 4807

*First logical block for swapping: 134672

Swapping class: 0

*SAT blocks for unit: 8

*SAT blocks in core: 8

Unit in the ASL: YES

Unit: <RET>

Startup option:

APPENDIX B
MODIFYING THE MONITOR

B.1 REBUILDING THE MONITOR LIBRARY FILE

The monitor library file, TOPS10.REL is distributed with the TOPS-10 monitor in a standard form. It is linked with the monitor common modules (COMMON, COMDEV, and COMMOD), as explained in Section 9.3 of this manual. For new installations, the procedure in Chapter 9 is sufficient for building the monitor.

The monitor library file contains assembled code for all the bundled monitor modules. If an installation has made modifications to the monitor, or if you changed any settings of feature test options in the FGEN portion of MONGEN, you must reassemble the monitor library file.

NOTE

The symbol values and configuration options possible with this procedure are so numerous that it is impossible to predict results in every combination. Therefore, you should be aware that the resulting operating system may not be supported by Digital Equipment Corporation.

Several modules must appear in a specific order. They are:

```
| F.MAC  
| S.MAC  
| NETPRM.MAC  
| DTEPRM.MAC  
| SYSCNF.MAC+COMMON.MAC  
| SYSCNF.MAC+COMDEV.MAC  
| SYSCNF.MAC+COMMODO.MAC  
| EJBDAT.REL  
| FILFND.MAC  
| FILIO.MAC  
| FILUO.MAC  
| RHXKON.MAC  
| RPXKON.MAC
```

These files must precede all other modules, and must be listed in this order. The following files must be placed, in this order, at the end of the list:

```
| PATCH.MAC  
| EDDT.REL  
| USRONC.MAC
```

For more information about building the monitor library file, read the batch control file COMPIL.CTL.

MODIFYING THE MONITOR

B.2 CHANGING COMMON SYMBOLS

The COMMON, COMDEV, and COMMOD modules contain symbols that may be redefined with MONGEN. This section lists those symbols. When entering the symbols to MONGEN, type them in the form:

symbol,value

The symbols and their default values are listed here as they might be typed in the MONGEN dialog.

The following symbols may be changed in Questions 126 through 128 of the SYSGEN portion of MONGEN. Decimal values are changed with Question 126, Octal values are changed with Question 127, and SIXBIT values are changed with Question 128.

B.2.1 Symbols Defined in COMMON

The following symbols are defined in COMMON. The symbols are listed in the form symbol,default-value.

B.2.1.1 Decimal Symbols,Values - The following symbols are defined with values in decimal radix.

ERPTMX,80	Specifies the length of block for errors.
EVBN,128	Blocks available for mapping buffers and IOWDs.
HIGHXC,80	Highest extended channel.
IFC0,5	Swapper fairness count maximum.
LIM1HS,30	Limit of stopcodes in any 1 hour period.
LOGSIZ,34	17K (current size of LOGIN CUSP).
M.BMAX,13	Maximum number of simultaneous batch job streams.
M.CBAT,10	Number of bad addresses in per CPU bad.
M.CLSN,16	Number of CPU classes for scheduler.
M.CMCT,32	Number of calls to CHKTAL routine.
M.DNSZ,30000	DECnet free core size.
M.DTLS,90	CPU time limit (seconds) to set.
M.EBPS,12500000	Default number of EBOX ticks per second.
M.ENQD,100	Default ENQ quota.
M.ENQM,500	Maximum number of active queues.
M.ETSZ,3000	Ethernet free core size.
M.KNSZ,3000	KLNI free core size.

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M.LASZ,15000	LAT free core size.
M.LCST,0	Length of the Line Data Block reserved for customer definition.
M.MBPS,9750000	Default MBOX references per second.
M.OMSM,60	Number of minutes between calls to BIGBEN.
M.PCST,0	Length of the Process Data Block reserved for customer definition.
M.PFHT	Default Page Fault Handler timer trap interval.
M.SCSZ,4000	SCA free core size.
MAXNBP,64	Maximum number of SNOOP UVO breakpoints.
MEMITL,4	Number of ways memory can be interleaved.
MINCOR,Jobn*300	Assume 3 DDBS per job.
MINMAX,1024*12	Smallest legal CORMAX.
MLACTS,39	Maximum length of the account string.
NSPMEM,1000	1000 nano-seconds per memory cycle.
PAVJSP,20	Predicted average job size.
RLDTIM,112	Time to auto-reload.
SFC0,20	CPU0 scheduler fairness count.
SFC1,20	CPU1 scheduler fairness count.
TTDMOS,16	Maximum output string for RSX-20F.
UFC0,10	UVO fairness counter maximum.
UFC1,10	UVO fairness counter for slave.

B.2.1.2 Octal Symbols,Values - The following symbols are defined by values in octal radix.

BPTBIT,0	Initial user "SET DDT BREAKPOINT" setting.
CTYDCR,0	Delay for RETURN on CTY during ONCE.
CTYDLF,0	Delay for LINE FEED on CTY during ONCE.
DEFBPT,0	Initial CPU breakpoint mask (one bit per CPU).
DEFDEB,0	Debugging word.
DTRY,4	Number of times to retry on DECTape errors.
INDPPN,0	0 means project programmer numbers are dependant across projects. That is, owner of PPN is determined by programmer number only.

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LIM1MS, 4	Limit of stopcodes in any 1 minute period.
LIM8MS, 7	Limit of stopcodes in any 8 minute period.
M.BMIN, 0	Minimum number of guaranteed batch jobs.
M.CLSS, 1	Scheduler is class system scheduler.
M.DCLS, 0	Scheduler class for new jobs.
M.EMRT, 0	Default is regular runtime.
M.ITA, 0	Default is to use interval timer.
M.JMAX, M.JOB-M.BMIN	Maximum number of simultaneous interactive jobs.
M.PIDN, JOBN*2	Size of PIDTAB.
M.RCMP, 0	Prohibits execution of restricted command features from remote terminals.
M.STOF, 0	Frequency to call start TTY output (must be 2^{n-1}).
M.WCH, JW.WMT	Watch bits used to set initial.
M.XFFA, 0	Do file access protection checking on [1,2] and JACCT.
SCHEDN, 0	Schedule value.
STDENS, 5	Standard density (6250 BPI).
SYSSEG, -1	Minus one for fast GETSEG from SYS.
TTXTRA, 0	Number of extra TTY DDBs for slave lines.

B.2.1.3 SIXBIT Symbols, Values - The following symbols are defined by values in SIXBIT radix.

	M.CRSH, CRSCPY	Default crash copy program name.
	M.MAIL, MS	Name of mail program

B.2.2 Symbols Defined in COMDEV

The following symbols are defined in COMDEV. The symbols are listed in the form symbol,default-value.

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B.2.2.1 Decimal Symbols, Values - The following symbols are defined with values in decimal radix.

DSETIM, 320	Maximum time to do a data security erase (seconds).
IDLSEC, 90	Any terminal idle this number of seconds gets disconnected.
LPTSIZ, 27+2	LPT buffer size in words (132 column printer).
M.AIDL, n	The number of seconds before idle ANF-10 lines are disconnected, where n defaults to the current value for IDLESEC (see above).
M.DIDL, n	The number of seconds before idle dataset lines are disconnected, where n defaults to the current value for IDLESEC (see above).
M.LIDL, n	The number of seconds before idle LAT lines are disconnected, where n defaults to the current value for IDLESEC (see above).
M.NIDL, n	The number of seconds before idle NRT/CTERM lines are disconnected, where n defaults to the current value for IDLESEC (see above).
MSGMAX, 512	Maximum message size in the network.
MTSIZ, 128	Magtape buffer size in words.
NOISE, 12	Noise record length in bytes.
NTTPLN, 32	Size of a terminal Process Control Block.
TAPTIM, 60	Maximum time to skip 10 records (seconds).
TTCHKS, 8	Size of words in a TTY chunk, in powers of 2, with a minimum of 8. Increasing the size of a TTY chunk can increase TTY throughput.
TTYRMT, 1	Remote terminal. If 1, terminal is remote. If 2, terminal is local.

B.2.2.2 Octal Symbols, Values - The following symbols are defined by values in octal radix.

MAXODR, 6	Maximum number of data requests for input devices.
MSGXMX, 512	Maximum message size the -10 will transmit.
MTDAEM, 10	Number of times per reel to call DAEMON for magtape error reports.
MTDLTP, LT.BLP	Default label type.
MTELOG, -1	Zero to log all recovered magtape errors.

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B.2.3 Symbols Defined in COMMOD

The following symbols are defined in COMMOD. The symbols are listed in the form symbol,default-value.

B.2.3.1 Decimal Symbols,Values - The following symbols are defined with values in decimal radix.

BLKMAX,100000	Maximum number of blocks to transfer (KL10).
BLKMAX,252	Maximum number of blocks to transfer (KS10).
CHVIFP,10	Standard initial fairness count for positioning.
CHVIFT,10	Standard initial fairness count for transferring.
DSKTRY,10	Number of error tries on disk data errors.
FIL4WD,9	Number of 8 word core blocks per job (for NMB,PPB,UFB,ACC).
M.BNDT,16	Number of seconds before binding CI disks at ONCE time.
MAXUSI,8	Maximum negative USETI (maximum number of extended RIBs).
MFDSIZ,30	Number of blocks for initial MFD set by refresher.
PTRLEN,7	Number of in-core retrieval pointers per file.
RCLTRY,10	Number of times to try 'DSKTRY' data errors.
SERTRY,3	Number of times to try on search errors.
SWCLSN,7	Highest class for swapping.
SWPMAX,8	Maximum number of units for swapping.
UNVRSE,500	Reciprocal safety factor for each unit.

B.2.3.2 Octal Symbols,Values - The following symbols are defined by values in octal radix.

CCWMAX,1	Maximum number of data channel command words.
LBFSIZ,1000	Default large-buffer size (OP.LBF on an OPEN). Specify the octal value in words in multiples of 200.
LIMLVL,5	Maximum number of nested SFDs for this monitor.

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LNMMXL,144	Maximum length of any logical name specified.
LNMMAX,77	Maximum number of logical names.
M.CBMX,JOBN-1	Default blocks in disk cache.
M.DFLB,3	Default number of large disk buffers.
M.DFNB,6	Default number of disk buffers.
MFDPRV,555000	MFD privileges (all can READ, LOOKUP).
PRVFIL,057	Standard file privilege.
PRVSPL,077	Protection for spooled output.
PRVSYs,155	Protection for most system programs.
PRVUFD,775	Standard UFD privilege.
PRYSYS,157	Protection for SYS:*.SYS.
RIBERN,0	RIB error threshold for RIB errors on structures in system search list.
SYNRPR,357000	Privileged files in SYS.
SYRDPR,355000	Non-privileged files in SYS.
SYSPRV,775000	SYS UFD privileges (project 1 can read/create on SYS).

B.2.3.3 SIXBIT Symbols,Values - The following symbol is defined by a value in SIXBIT radix.

M.QSTR,	Default structure for device queues. The default value for M.QSTR is blank. The value is the SIXBIT name of the file structure for queuing programs set up by ONCE-only code to be the first stream up.
---------	---

APPENDIX C

SETTING SCHEDULER PARAMETERS

The SCDSET program enables a privileged user to accomplish the functions of the SCHED. monitor call, and to manipulate a SCDMAP.SYS file. For example, you can use SCDSET to do the following:

- o Set system usage quotas
- o Adjust scheduler parameters
- o Create and modify a SCDMAP.SYS file
- o Move a SCDMAP.SYS file into the SYS area
- o Update the class of all logged-in jobs automatically

C.1 REQUIRED PRIVILEGES

The privileges required to use SCDSET depend on the functions you want to accomplish. The following list describes the privileges required for different functions.

- o To manipulate a SCDMAP.SYS file, you need only to have the privileges necessary to move the file into the SYS area.
- o To set system usage quotas, and adjust scheduler parameters, you must be logged in as [1,2], or the SCDSET program must have JACCT privileges.
- o To use the READ/SET functions, you must be logged in as [1,2].

C.2 CAUTIONS

If you misunderstand how the scheduler works, or make typing mistakes while using SCDSET, you may unintentionally halt all work being done on the system. Therefore, practice working with SCDSET and the scheduler during non-production timesharing until you are familiar with both of them.

To prevent system quotas and system load from affecting your work, run SCDSET in a High Priority Queue (HPQ) except when you create or modify a SCDMAP.SYS file. If you use an HPQ when you create or modify a SCDMAP.SYS file, you adversely affect system performance.

SETTING SCHEDULER PARAMETERS

C.3 SCDSET COMMANDS

This section describes the top-level SCDSET commands. It also describes EDIT subcommands, and the parameters you can read and set with the READ/SET commands.

C.3.1 EDIT

Calls the MAKMAP routine. The MAKMAP routine enables you to create or modify a SCDMAP.SYS file. EDIT uses the following subcommands:

Subcommand	Function
COPY/SET	Copies a file from a area or device to the SYS area.
EXIT	Returns to top-level.
HELP	Displays EDIT help text.
ONE CLASS	Changes one scheduler type to a scheduler class in the SCDMAP.SYS file.
RANGE	Changes a range of scheduler types to scheduler classes in the SCDMAP.SYS file.
READ	Reads in a SCDMAP.SYS file for modification.
TYPE	Displays a specified range of scheduler types.
WRITE	Writes a SCDMAP.SYS file to a device or area.

C.3.2 EXIT

Returns your job to monitor level.

C.3.3 HELP

Displays help text.

C.3.4 READ/SET

Execute functions of the SCHED. monitor call. You can read or set the following parameters:

Parameter	Meaning
AVG SWAP TIME	The estimated average swap time for a typical job on the system. The AVG SWAP TIME controls the rate at which the swapper changes from one class to the next when it chooses jobs to swap in.
BB CLASS	The class to run as background batch. Background batch class jobs run whenever the system is otherwise idle.

SETTING SCHEDULER PARAMETERS

BB SWAP TIME

The estimated time required to swap a background batch job. The scheduler uses the BB SWAP TIME to decide when the system should permit a background batch job to be swapped in.

CORE SCHEDULING INTERVAL

The rate at which the system stops accounting for in-core protect time and stops using in-core protect time to requeue jobs. The CORE SCHEDULING INTERVAL is important for systems with a large amount of memory, or very few users.

CPU SCAN ORDER

The scan table used by a CPU or CPUs.

DEFAULT CLASS

The class new jobs assume when they first log in. The DEFAULT CLASS applies to a new job until LOGIN reads the job's class from SCDMAP.SYS and changes the class appropriately.

FREE CORE GOALS/LIMITS

The percentage of free and potentially free memory that must be available to the swapper. If this percentage is not available, the swapper swaps out jobs in long term wait.

HIGH SEGMENT RETENTION TIME

The dormant high segment retention time is high segment in-core protect time. It prevents the deletion from memory of high segments which have become dormant until a specified time has elapsed.

IN-CORE FAIRNESS FACTOR

The factor that controls the rate at which out of core jobs and in-core jobs are scheduled for swapping.

JOB CLASS

The scheduler class of all logged in jobs.

MS INTERVAL

The Micro Scheduling interval (in jiffies). The MS interval specifies how often the scheduler selects a class to be scheduled.

PRIMARY PERCENTAGES

The system usage percentages for a particular job class. The sum of all primary percentages may be fixed. In this case, the scheduler only chooses a job to run when its class has the highest priority. When the sum is fixed, a class cannot exceed its class quota. If the only runnable jobs are in this class, the scheduler runs the null job.

PROT

A constant used to calculate the minimum core usage quota. The measurement is in microseconds.

SETTING SCHEDULER PARAMETERS

- PROT1**
The in-core timeslice used after a job has expired its initial in-core protect time. PROT1 controls the rate at which I/O bound jobs circulate around the run queues.
- PROTM**
The maximum in-core protect time assigned to a job. It specifies an upper limit for very large jobs.
- PROTOT**
A constant used to calculate the minimum core usage quota. The measurement is in microseconds.
- RESPONSE FAIRNESS**
The rate at which the scheduler chooses jobs to run. The rate depends on the order of the jobs in the "just swapped in list", and the allocations specified by the job classes.
- RUNTIME BY CLASS**
The amount of runtime each class has used since the last time that a class quota was changed. The measurement is in jiffies. This parameter also displays the percentage of runtime each class has used.
- SCHEDULER FAIRNESS**
The rate at which PQ2 jobs are scheduled ahead of PQ1 jobs. SCHEDULER FAIRNESS allows compute bound jobs to run even when there are many interactive jobs running.
- SECONDARY ALLOCATION**
The maximum amount that a class will be given after using up the primary percentage.
- SWAPPER FAIRNESS**
The rate at which PQ2 jobs are swapped in ahead of PQ1 jobs.
- TIME BASE**
The base run quanta (in milliseconds) for either run queue. Note that internally, the scheduler stores this value in local jiffies. Therefore, it may not be possible to adjust the time slice by a few milliseconds.
- TIME MAXIMUM**
The maximum quantum runtime that a job uses.
- TIME MULTIPLIER**
The parameter that assigns a larger quantum runtime for large jobs. The quantum runtime is the result of the following:
$$(\text{TIME BASE}) + (\text{TIME MULTIPLIER}) * (\text{job size})$$

The scheduler compares the quantum runtime to a run quantum maximum, and assigns the smaller of the two values to large jobs.

SETTING SCHEDULER PARAMETERS

C.3.5 UPDATE JOBS

The UPDATE JOBS command updates all the job parameters defined above for logged in jobs, and writes the changes to files if requested. UPDATE JOBS accomplishes this through the FIXJOB routine, which does the following:

- o Asks if you want to move a new SCDMAP.SYS file to the SYS area. If you answer yes, you move the SCDMAP.SYS file. If you answer NO, FIXJOB calls the MOVMAP routine to move the SCDMAP.SYS file.
- o Gets each logged in job's PPN.
- o Determines whether to use the batch half or timesharing half of the SCDMAP.SYS file currently on SYS.
- o Looks in ACTDAE.SYS for the user's scheduler type.
- o Executes the SCHED. monitor call to put that job in the correct scheduler class.
- o Prints an error message for each logged in job it does not find in ACTDAE.SYS, or for which the SCHED. monitor call failed.

The FIXJOB routine does not execute the SCHED. monitor call for [2,5] jobs, or for its own job.

C.4 THE SCDMAP.SYS FILE

You must have the SCDMAP.SYS file on SYS. The file contains 1024 (decimal) nine-bit entries (256 decimal words). The first 512 entries constitute the map for timesharing users, the second 512 entries constitute the map for batch users. Each entry contains a number between zero and thirty-one inclusive (0-31) that specifies a scheduler class. Each of the 512 scheduler types for both timesharing and batch has an entry.

At login time, LOGIN looks in ACTDAE.SYS for the PPN's scheduler type and then looks in SCDMAP.SYS for the current scheduler class for that scheduler type and job type (timeshare or batch).

If you do not want to differentiate between timeshare and batch, the second half of the map should be identical to the first half.

SETTING SCHEDULER PARAMETERS

The format of the SCDMAP.SYS file is as follows:

Table C-1: SCDMAP.SYS Format

BITS	0-8	9-17	18-26	27-35
Word 0	n0	n1	n2	n3
Word 1	n4	n5	n6	n7
Word 2	n8	n9	n10	n11
nXXX is the location of the Scheduler Class for timesharing users of Scheduler Type XXX, as stored in ACTDAE.SYS.				
Word 127	n508	n509	n510	n511
Word 128	m0	m1	m2	m3
Word 129	m4	m5	m6	m7
Word 130	m8	m9	m10	m11
Word 255	m508	m509	m510	m511
mXXX is the location of the Scheduler Class for batch users of Scheduler Type XXX, as stored in ACTDAE.SYS.				

APPENDIX D

CREATING BOOTABLE FRONT-END MEDIA

This appendix documents the procedure for creating bootable front-end media for RSX-20F. These media provide a fallback capability if the front-end file system on your system's RP06 disk is damaged or lost.

The installation process comprises two parts. Part 1 of the process, described in Section D.1, creates the "A" and "B" DECTapes or floppies, and requires that your system be standalone. Part 2, described in Section D.2, creates the "C" DECTape or floppy, and can be performed at any time, either before or after part 1 is performed, without shutting down timesharing on the KL.

D.1 BUILDING THE PRIMARY BOOTABLE VOLUMES

This procedure assumes:

- o that your system has a bootable front-end file system mounted on the front-end's hard disk drive.
- o that the system has been shut down, as this process must be done in a standalone environment.
- o that you have installed your front-end files using the RSXINS procedure described in chapter 8.
- o that you have a set of three DECTapes or floppies in good condition to hold the front-end files.

The example below illustrates the procedure for both DECTapes and floppies. The left-hand column displays the DECTape procedure; the right-hand displays the floppy procedure.

1. Mount the disk pack containing a bootable RSX-20F system in the front-end RP06.
2. Mount a pair of DECTapes or floppies on drives 0 and 1. These will become the A and B volumes of the set you are creating.
3. If you are writing DECTapes, ensure that both DECTape drives are write enabled.
4. Set the PDP-11 console switches to 000203.
5. Press the SW/REG and ENABLE switches at the same time.

CREATING BOOTABLE FRONT-END MEDIA

6. Initialize the media on drive 0:

For DECTapes:

```
<CTRL/\>  
PAR>MCR INI<RET>  
INI>DT0:/INDX=MID<RET>
```

For floppies:

```
<CTRL/\>  
PAR>MCR INI<RET>  
INI>DX0:<RET>
```

The INI program will now initialize the volume. This process will take approximately 5 minutes for a DECTape or 30 seconds for a floppy. The INI program will not reprompt when it is complete.

7. Repeat step 6 for drive 1, substituting a 1 for the 0 in the command line for INI.
8. Now tell RSX-20F to mount the media:

For DECTapes:

```
<CTRL/\>  
PAR>MCR MOU<RET>  
MOU>DT0:<RET>  
MOU -- MOUNT COMPLETE  
MOU>DT1:<RET>  
MOU -- MOUNT COMPLETE  
MOU><CTRL/Z>
```

For floppies:

```
<CTRL/\>  
PAR>MCR MOU<RET>  
MOU>DX0:<RET>  
MOU -- MOUNT COMPLETE  
MOU>DX1:<RET>  
MOU -- MOUNT COMPLETE  
MOU><CTRL/Z>
```

9. Create the [5,5] UFD on the volume on unit 0, using the UFD utility:

For DECTapes:

```
<CTRL/\>  
PAR>MCR UFD<RET>  
UFD>DT0:[5,5]<RET>
```

For floppies:

```
<CTRL/\>  
PAR>MCR UFD<RET>  
UFD>DX0:[5,5]<RET>
```

UFD, like INI, does not reprompt when it is finished. The UFD creation process takes about 3 minutes on a DECTape and about 15 seconds on a floppy.

10. Repeat step 9 for the volume on drive 1.

The remaining commands are common to both DECTape and floppy systems.

11. Invoke the PIP utility to copy the files to both volumes:

```
<CTRL/\>  
PAR>MCR PIP<RET>  
PIP>@BLDFE1<RET>
```

BLDFE1 is a command file that tells PIP which files to put on each of the two volumes. It instructs PIP to copy the files to each volume and then to do a directory of the newly-created files. The process will take about 40 minutes for DECTapes and about 10 minutes for floppies.

CREATING BOOTABLE FRONT-END MEDIA

- Exit from PIP and boot the unrun image of RSX-20F from the file RSX20F.SYS. This image will use the newly created front-end volumes as the system device SY:.

```
PIP><CTRL/Z>  
<CTRL/\>  
PAR>MCR BOO<RET>  
BOO>DB0:RSX20F.SYS<RET>
```

- Wait a few seconds and then type control-backslash. This will cause the newly-booted RSX-20F to search for the PARSER on DECTape or floppy 0.

Please note that all commands will take somewhat longer to perform, as the files must now be read in from DECTape or floppy.

```
<CTRL/\>  
INS -- SY MOUNTED, TSK=PARSER
```

```
PAR -- [PARSER] ESE - EBOX STOPPED - EXAMINE  
PAR>
```

- If you are building a floppy-based system, please skip this step. The DECTape version of RSX-20F does not mount DECTape 1, so you must do it manually:

```
PAR>MCR MOU<RET>  
MOU>DT1:<RET>  
MOU -- MOUNT COMPLETE  
MOU><CTRL/Z>
```

- Next, set some PARSER parameters and save the full RSX-20F image to the front-end media. The last command, which directs SAV to save the system core image, will take about 10 minutes to execute. Once the save is completed, the newly saved software will be reloaded automatically.

```
<CTRL/\>  
PAR>SET CONSOLE MAINTENANCE<RET>  
CONSOLE MODE: MAINTENANCE  
PAR>SET FAULT-CONTINUE<RET>  
FAULT-CONTINUATION: ON  
PAR>SET DATE<RET>  
DATE: 16-MAR-88<RET>  
TIME: 16:11<RET>  
CURRENT SYSTEM DATE:  
WEDNESDAY, 16-MARCH-88 16:11  
VALIDITY FLAG IS:ON  
PAR>MCR SAV<RET>  
SAV>SY0:/WB<RET>  
[Dx0: dismounted]  
[Dx1: dismounted]
```

```
RSX-20F Vx##-## 16-MAR-88
```

```
[SY0: redirected to Dx0:]  
[Dx0: mounted]  
[Dx1: mounted]  
<CTRL/\>
```

```
PAR -- [PARSER] ESE - EBOX STOPPED - EXAMINE  
PAR>
```

CREATING BOOTABLE FRONT-END MEDIA

16. Lower and raise the HALT switch on the PDP-11 console, set the PDP-11 console switches to 000203, and press the SW/REG and ENABLE switches at the same time.

You may now remove the DECTapes or floppies from the drives. Please be sure to place labels on them identifying the volumes -- the one on drive 0 should be labelled "A"; the one on drive 1, "B".

You now have a minimal bootable RSX-20F system on the first two DECTapes or floppies. If you wish, you may build the third volume now, or you may reboot the KL system and build the third volume after timesharing has been restarted.

D.2 BUILDING THE THIRD VOLUME

To have a complete copy of RSX-20F on console media, you must create a third volume of front-end media. This volume will hold additional files that will not fit on the first two of the set.

The steps involved can be done immediately after Part 1 is completed, or they may be done later. It is not necessary to shut down the KL before starting this procedure.

1. Mount the floppy or DECTape that is to receive the files on drive 0.
2. Initialize the media on drive 0:

For DECTapes:

```
<CTRL/\>  
PAR>MCR INI<RET>  
INI>DT0:/INDEX=MID<RET>
```

For floppies:

```
<CTRL/\>  
PAR>MCR INI<RET>  
INI>DX0:<RET>
```

The INI program will now initialize the volume. This process will take approximately 5 minutes for a DECTape or 30 seconds for a floppy. The INI program will not reprompt when it is complete.

3. Now tell RSX-20F to mount the device, making it available for use:

For DECTapes:

```
<CTRL/\>  
PAR>MCR MOU<RET>  
MOU>DT0:<RET>  
MOU -- MOUNT COMPLETE  
MOU><CTRL/Z>
```

For floppies:

```
<CTRL/\>  
PAR>MCR MOU<RET>  
MOU>DX0:<RET>  
MOU -- MOUNT COMPLETE  
MOU><CTRL/Z>
```

4. Create the [5,5] UFD on the volume, using the UFD utility:

For DECTapes:

```
<CTRL/\>  
PAR>MCR UFD<RET>  
UFD>DT0:[5,5]<RET>
```

For floppies:

```
<CTRL/\>  
PAR>MCR UFD<RET>  
UFD>DX0:[5,5]<RET>
```

CREATING BOOTABLE FRONT-END MEDIA

UFD, like INI, does not reprompt when it is finished. The UFD creation process takes about 2 minutes on a DECTape and about 10-15 seconds on a floppy.

5. Now invoke PIP, and tell it to copy the files. The commands in this example are common to both DECTape and floppy systems.

```
<CTRL/\>  
PAR>MCR PIP<RET>  
PIP>@BLDFE2<RET>
```

BLDFE2, like the BLDFE1 file used in Part 1, tells PIP which files belong on this volume. It will also do a directory of the volume when it is finished copying those files. The process will take about 20 minutes for DECTapes and 5 minutes for floppies.

6. Once the file copy is complete, exit from PIP and dismount the volume:

For DECTapes:

```
PIP><CTRL/Z>  
<CTRL/\>  
PAR>MCR DMO<RET>  
DMO>DT0:<RET>  
DMO -- DISMOUNT COMPLETE  
DMO><CTRL/Z>
```

For floppies:

```
PIP><CTRL/Z>  
<CTRL/\>  
PAR>MCR DMO<RET>  
DMO>DX0:<RET>  
DMO -- DISMOUNT COMPLETE  
DMO><CTRL/Z>
```

7. Remove the DECTape or floppy from the drive. Label it as volume "C" of the set.

The installation process is complete.

GLOSSARY

This appendix lists and explains the terms and conventions used in this manual.

AC

An accumulator.

Accounting Files

The files that are used to control access and use of computer resources. ACTDAE.SYS and QUOTA.SYS are the accounting files. See Chapter 9 for more information about these files.

AUTCON

The monitor module to automatically configure tape and disk drives. AUTCON is part of the monitor, that detects changes in status of I/O channels. It is also invoked at system startup to build the appropriate data bases for mass-bus and CI bus devices.

BAF block

The BAT block that is stored in memory.

BAT block

The data table, stored on disk, containing information about bad areas on disk.

CRASH.EXE

The file automatically written by BOOT when the system fails. CRASH.EXE can be used to reload a suspended monitor.

CTY:

The console terminal for the front-end and CPU. The CTY is usually a hard-copy terminal, so that important information about the system that is printed can be easily perused when the system is not running.

CUSP

A Commonly Used System Program that works closely with the monitor to perform system functions. For example, LOGIN, PIP, and BACKUP are CUSPs.

DAY-MON-YEAR

The format of the system date you supply to the ONCE-only dialog.

Ersatz Device Names

The monitor associates certain device names with PPNs. Such a device name is called an "ersatz device." The list of ersatz device names can be expanded with Question 49 of the HDWGEN portion of MONGEN.

File Structure

A file structure is one or more disk packs, mounted and spinning, that have been defined to the monitor as a single entity to be referenced and accessed by the file structure name. File structure information is entered into the disk HOME blocks by the ONCE program.

HH:MM:SS

The time you input for the system time in the ONCE-only dialog.

HIGH-ADDR

The high-bound physical address in memory that is referenced in the ONCE dialog.

HOME block

The data block that is stored on disk which contains information about the unit's file structure, access information, and amount of swapping space.

Initial Job Search List

The job's initial search list (established by LOGIN from the information in the accounting files.)

Job Search List

Those file structures that constitute DSK for the job.

LOW-ADDR

The lower-bound address of a physical address reference specified in the ONCE dialog.

MFD

The Master File Directory of all the User File Directories. An MFD is kept for each file structure.

ONCE

The monitor module that contains the ONCE-only mandatory system startup dialog and I/O device initialization. In debugging mode, ONCE preserves the monitor's symbol table. If the data is not available, ONCE asks why the system is being reloaded, and allows any of several startup options to change disk parameters and/or start up the system.

ONCMOD

The monitor module containing the optional ONCE-only system startup dialog for disk initialization. Structure and unit parameters are changed using ONCMOD. TWICE runs ONCMOD during timesharing.

OPR device

A designation made for the benefit of the monitor, which indicates the terminal from which the operator's controlling job is running. Monitor messages for the operator are directed to the OPR device.

OPR program

The operator-interface program to the various components of the GALAXY batch and spooling system.

PPN

A project-programmer number. [PPN] in square brackets represents the User File Directory of the user with that PPN.

REFSTR

The monitor module that is called by ONCE and TWICE, to refresh structures.

SAB block

The SAT block that is stored in memory.

SAT block

The Storage Allocation Table, stored on each disk unit, containing information about the status of the clusters on the disk and their use bits, which tell whether clusters on the disk are "in use," storing data, or "free" for storage of data.

STR-NAME

The name of a defined file structure, which you provide to the ONCE dialog.

SYSINI

The monitor module responsible for system initialization. SYSINI runs only in the policy, or boot, CPU. It invokes the ONCE dialog, initializes device data blocks, maps memory, and sets up monitor service routines, such as the RSX-20F interface. In time, it causes CPU startup.

System Dump List

The list of file structures that will be searched for space to store CRASH.EXE when the system fails.

System Search List

Those files structures that are searched when some ersatz device names, such as SYS: or DEC:, are used.

UFD

The User File Directory that lists the files of each user in a file structure.

UNIT-NAME

The physical unit name of a disk specified in the ONCE dialog.

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