Starting and Running AOS/VS on ECLIPSE MV/2000™ DC and DS/7000-Series Systems

Starting and Running AOS/VS on ECLIPSE MV/2000™ DC and DS/7000-Series Systems

069-000129-01

NOTICE

Starting and Running
AOS/VS on
ECLIPSE MV/2000™ DC
and DS/7000-Series Systems
069-000129-01

Preface

Welcome to AOS/VS for ECLIPSE MV/2000™ DC and Data General Distributed Systems/7000-series computer systems. This version of AOS/VS contains an easy startup procedure and friendly menus to help with system management. It also offers a simplified method to recover from abnormal system shutdowns, and an on-line interactive tutorial to introduce you to AOS/VS system management on ECLIPSE MV/2000 DC and DS/7000-series systems.

Who This Book Is For

This book is for users and system managers on systems that will run AOS/VS for ECLIPSE MV/2000 DC and DS/7000-series systems.

Not all the information covered in this book is intended for the typical system user. For this reader, we give a brief overview of AOS/VS and describe some tasks that the user can perform via the easy-to-use menus, such as controlling printers and doing backups of personal files. We also supply a glossary at the end of the manual, which describes some computer-related terms with which you might not be familiar.

The system user who will also perform system management tasks will find the entire manual useful, as it describes startup, everyday system management tasks, advanced system management functions, and error situations.

We suggest that you read the first two chapters before starting up your system for the first time. Then read the other portions as you need them.

At the beginning of each chapter and some chapter sections, we have placed a key showing the type of user the chapter or section is intended for.

How This Book Is Organized

This manual is divided into seven chapters, three appendixes, a glossary, and two tear-out summary sheets. They describe the following:

Chapter 1   *For system managers and system users.*
              Introduces the ECLIPSE MV/2000 DC and DS/7000-series systems and describes AOS/VS and the system console. It explains how to use the menus and the on-line Help facility, and introduces the interactive system management tutorial.

Chapter 2   *For system managers only.*
              Describes the powerup sequence for the ECLIPSE MV/2000 DC, DS/7500-series, and DS/7700-series computers. It also describes the Starter program and its Main Menu options.

Chapter 3	*For system managers and system users.*
	Discusses system management. It informs both system managers and system users of the system manager's responsibilities, system security, and user profiles. This chapter describes the System Management Interface (SMI) program, and explains how to use its menus to perform tasks. It shows which tasks are restricted to the system manager, and which are available to all system users.
Chapter 4	*For system managers and system users.*
	Describes how to back up and restore files using the SMI archiving menus. It explains the backup and restoration procedures for both personal files and system-wide files, for systems using diskettes and systems using tape. This chapter also contains notes and cautions about handling and storing diskettes and tape.
Chapter 5	*For system managers only.*
	Describes some of the more technical system management functions, including advanced procedures the system manager can perform during powerup. It explains the options available on the Change Preset Values Menu and the Technical Maintenance Menu. Chapter 5 also describes how to improve system performance by reducing file fragmentation.
Chapter 6	*For system managers only.*
	Introduces the XODIAC™ networking program, which allows your system to communicate with others over a network.
Chapter 7	*For system managers and system users.*
	Describes common error situations and how to deal with them.
Appendix A	*For system managers only.*
	Explains how to reformat the disk and load AOS/VS from backup media in the event of a damaged disk.
Appendix B	*For system managers and system users.*
	Describes keywords and alphabetically lists the sets of Starter and SMI keywords that you can use to move quickly between menus, explaining where each one places you.
Appendix C	*For system managers only.*
	Describes what to expect if you use a hard-copy terminal as the system console.
Glossary	*For system managers and system users.*
	Defines some related terminology that you might not be familiar with.
Powerup Summary	*For system managers only.*
	Summarizes the typical startup procedure on a tear-out sheet.
Keyword Summary	*For system managers and system users.*
	Duplicates on a tear-out sheet the alphabetical list of Starter and SMI keywords from Appendix B.

Related Documentation

This book might be just a take-off point. Depending on what you want to do with AOS/VS and what other software you will run on your system, you might find some of the following documentation helpful.

Hardware

Setting Up and Starting Your MV/2000 DC or DS/7500 Series System (014-001213)
Setting Up and Starting Your DS/7700 Series System (014-001224)
Expanding Your MV/2000 DC or DS/7500 Series System (014-001212)

AOS/VS Documentation

AOS/VS System Management Tutorial
Learning to Use Your AOS/VS System (069-000031)
Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS) (093-000122)
How to Generate and Run AOS/VS (093-000243)
SED Text Editor User's Manual (AOS and AOS/VS) (093-000249)
AOS/VS System Concepts (093-000335)
System Call Dictionary (AOS/VS and AOS/DVS) (093-000241)

Diagnostics and System Control Program (SCP)

*Installing and Running Co-resident Diagnostics on the ECLIPSE MV/2000™ DC and
  DS/7000-Series Workstations* (015-000257)
ADES Operator's Manual (014-000744)
ECLIPSE MV/2000™ DC and DS/7000 Family System Control Program (014-001219)

Graphics and Windowing

Using DG/VIEW (069-000130)
DG/VIEW Summary (069-000131)
Introduction to Computer Graphics (014-001216)
CEO Drawing Board™ User's Manual (069-700010)

Communications and Networks

Using the XODIAC™ Network Management System (093-000178)
Managing and Operating the XODIAC™ Network Management System (093-000260)

Comprehensive Electronic Office (CEO®)

Getting Started with the CEO® System (069-000036)
Managing Your CEO® System (093-000286)
Using CEO® Word Processing (093-000285)

In addition, if you are using programming languages or database products (such as
INFOS II), you will find the documentation that comes with these products helpful.

Documentation Conventions

In this book, we use the words *terminal, console,* and *system console.* They mean the
following:

Terminal   An interactive device with a keyboard for input and a screen or printer for
output. A terminal with a screen is called a display terminal; a terminal with
a printer is called a hard-copy terminal.

Console   Another word for terminal. We use console in this book to mean any terminal
on the system, including the system console. Consoles can be display terminals,
like the DASHER® D460, or hard-copy terminals, like the DASHER TP2.

System   The console that will display diagnostic messages and from which you will
Console   bring up AOS/VS.

In examples and figures, we use

> **this typeface to show your input.**
> *this typeface to show system messages and prompts.*
> `this  typeface  to  show  screens  and  status  displays.`

We often show user input in all UPPERCASE letters, but you can use lowercase, UP-
PERCASE, or any combination of the two.

Additionally, we use certain symbols in special ways.

⌡   means press the NEW LINE key on your console's keyboard.

)   is the AOS/VS CLI prompt.

☐   means press the space bar. (We use this only where we must; normally, you can see
       where to put spaces.)

Contacting Data General

- If you have comments on this manual, please use the prepaid Remarks Form that
  appears after the Index. We want to know what you like and dislike about this manual.

- If you need additional manuals, please use the enclosed TIPS order form (USA only)
  or contact your Data General sales representative.

<div align="center">End of Preface</div>

Contents

Chapter 1 - Introduction

Chapter 2 - Starting Up the System

Chapter 3 - Managing the System

Chapter 4 - Backing Up and Restoring Files

Chapter 5 - Performing Advanced Functions

Chapter 6 - Communicating with Another System

Chapter 7 - What if Something Goes Wrong?

Appendix A - Reinstalling AOS/VS If the Disk Is Damaged

Appendix B - Keyword Summary

Appendix C - Using a Hard-Copy System Console

Glossary

Powerup Summary

Alphabetical Listing of Starter Keywords

Tables

Table

Illustrations

Chapter 1
Introduction

This chapter is for the

System Manager	✓

System User	✓

Your ECLIPSE MV/2000™ DC or DS/7000-series computer is a powerful single- or multiuser system. When installed, your system might look something like Figure 1-1.
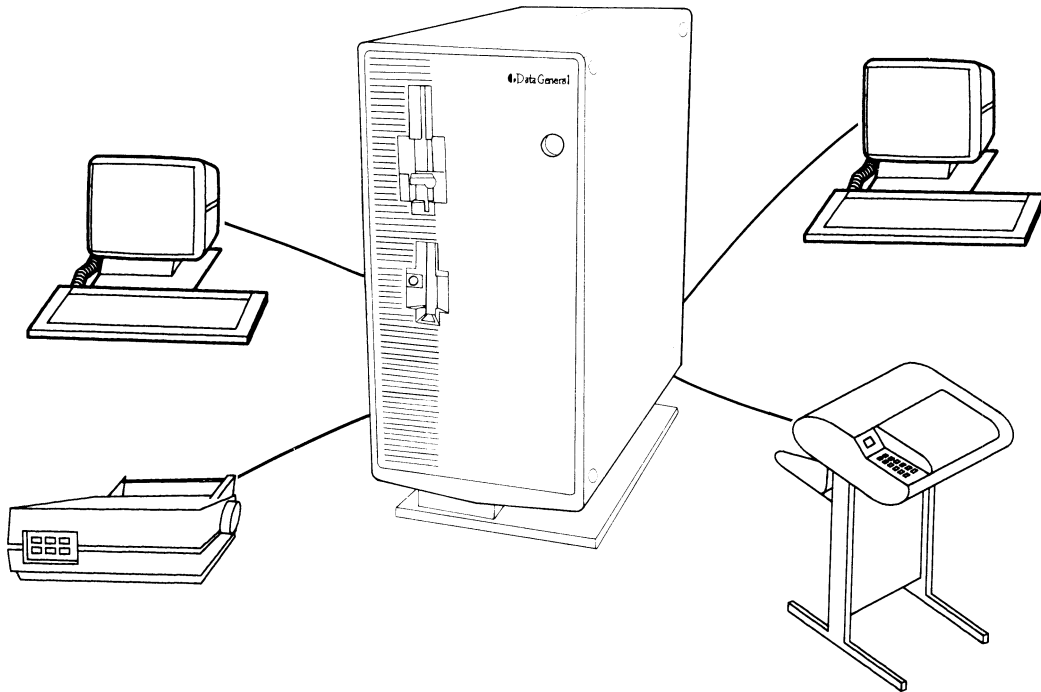
DG-27303

Figure 1-1. A Multiuser ECLIPSE MV/2000™ DC System

All of your terminals and printers are attached to the computer unit with *cables*, which are thick electrical wires. You can have various types of terminals and printers on your ECLIPSE MV/2000 DC or DS/7000-series system. Figure 1-2 shows a DASHER® D410 or D460 terminal, which consists of a keyboard for input and a video tube — much like a television screen — for output.

The ECLIPSE MV/2000 DC, DS/7500-series, and DS/7700-series systems provide small-scale computer solutions for various types of work environments. They are available in many diverse configurations of features. Depending on your configuration, you might have a

*   Multiuser business workstation

*   Technical workgroup computer

*   Departmental data processing system

*   Architectural engineering workstation

*   Computer-aided design (CAD), computer-aided engineering (CAE), or computer-aided manufacturing (CAM) system.

or one of many other possibilities.
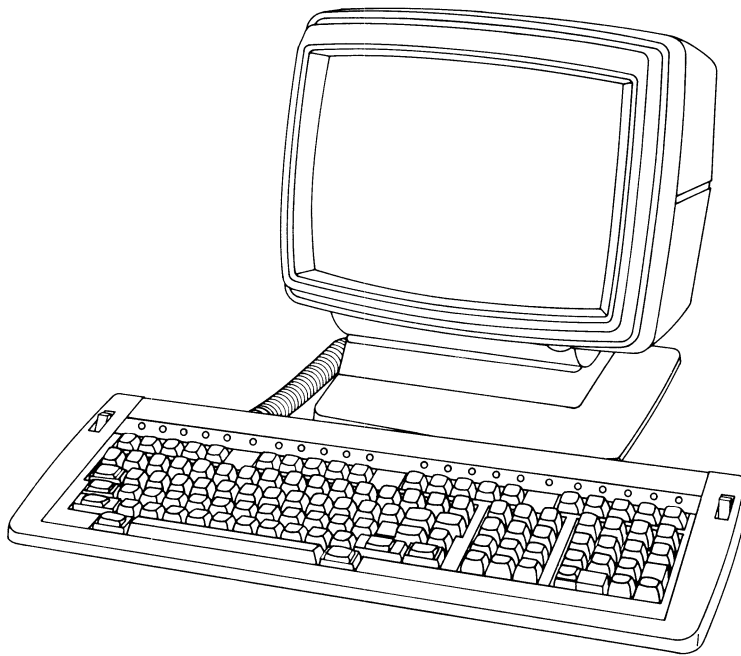
DG-25876

Figure 1-2. DASHER® D410/D460 Display Terminal

069-000129

About the ECLIPSE MV/2000 DC and DS/7000-Series Systems

Whether the system you have purchased is an ECLIPSE MV/2000 DC or a DS/7000-series computer, you have a 32-bit under-the-desk computer system with the following basic components:

- Base system board; also known as the system processing unit (SPU) or processor.

- Power supply and cooling fans.

- System disk containing pre-installed AOS/VS and diagnostic programs for your system.

- Magnetic storage device — either cartridge tape, reel tape, or diskette drive.

- System console.

Figures 1-3 and 1-4 show the ECLIPSE MV/2000 DC and DS/7700 computer units. The DS/7500 system looks like the ECLIPSE MV/2000 DC.

In addition to the system's basic components, you might have other features as options, depending on which system you bought. For example

- Communications board(s).

- Graphics board(s).

- Additional disk unit.

- Additional magnetic storage device(s).

- Expansion memory card.

- Additional terminal(s).
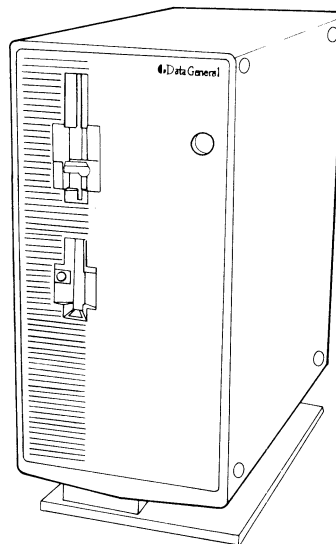
DG-27318

Figure 1-3. The ECLIPSE MV/2000™ DC System
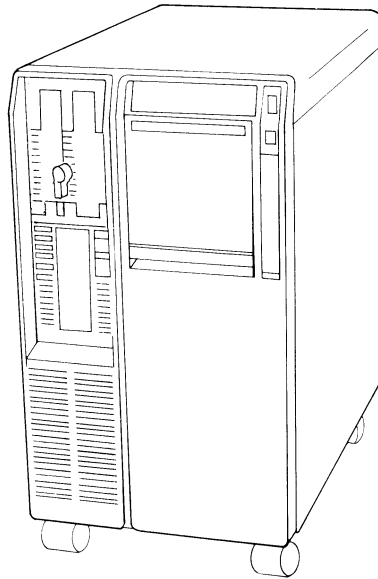
DG-27312

Figure 1-4. The DS/7700 System

Depending on your system, you can have one or many users running at the same time. The ECLIPSE MV/2000 DC, for example, supports up to 24 user devices, which include such things as terminals and printers.

If you have a DS/7000-series system, you have either color or monochrome graphics capabilities, and various graphics input devices. (Graphics is not available on the ECLIPSE MV/2000 DC.) This manual does not describe graphics or windowing for DS/7000-series systems; for information see *Using DG/VIEW* and the *DG/VIEW Summary.* For system management instructions concerning windowing and powerup, see *How to Generate and Run AOS/VS.*

What is AOS/VS?

The operating system you have chosen to run on your system is AOS/VS. AOS/VS is Data General's Advanced Operating System with Virtual Storage. An operating system is a program that runs other programs. It handles the task of communicating with *peripherals*, such as terminals and printers, as well as deciding which program should run at any given time.

You, or a program you are running, issue *commands* to the computer, which the operating system translates for the computer. The computer does what the operating system instructs, then tells the operating system that it is done. The operating system then displays an appropriate message to you.

The virtual storage or virtual memory that is a feature of AOS/VS allows programs to be very large without requiring a large amount of physical memory.

1-4

The operating system is the lowest level of computer software; it *supports* higher level software, such as word processors, computer languages, and other applications you might have that are specific to your work environment.

AOS/VS is a general-purpose operating system that runs on 32-bit DGC ECLIPSE® computers, including MV/2000 DC and the DS/7000-series. It is a *timesharing* system, meaning that it can serve many users at the same time, each of whom is using a terminal and using word processing or other operations. AOS/VS also supports *batch* operations, which are jobs that run without human intervention or attention. AOS/VS can also run *real-time* programs, which can gain direct access to *devices* (for example, a disk or a printer), receive priority scheduling, and remain in the computer's memory.

AOS/VS Processes

AOS/VS can do all these things because it is a *multiprogramming* system; it can run many programs simultaneously. Each running program is called a *process*. Every user on the system is running at least one process. Each process has a specified amount of main memory; it often has its own terminal; and it can use the devices. On some large computers, AOS/VS can manage over 1000 processes at the same time.

Security on AOS/VS

AOS/VS is a secure system. It allows only authorized people to log on to user terminals. An authorized person is one for whom the System Manager has created a *user profile*. The profile determines what the user's privileges are and what system resources (like disk space and main memory) the user is assigned. We describe system security and user profiles in more detail in Chapter 3, "Managing the System."

AOS/VS does not require multiple terminals, however. It can manage a single-terminal ECLIPSE MV/2000 DC or DS/7000-series system quite well.

AOS/VS for ECLIPSE MV/2000 DC and DS/7000-Series Systems

AOS/VS for ECLIPSE MV/2000 DC and DS/7000-series systems has all the features that AOS/VS does on other computers, including the *menu-driven* System Management Interface (SMI) that allows you to perform certain system management tasks more easily than on other machines. An *interface* is the interaction between you and the computer — how the computer communicates with you and what you see on your screen. *Menu-driven* means that you will see *menus* — that is, lists of options — on your screen, from which you can select what function you want to perform. Both the Starter and SMI programs are menu-driven. We describe these programs in Chapters 2 and 3.

AOS/VS for ECLIPSE MV/2000 DC and DS/7000-series systems also comes with an on-line tutorial, which can help you learn about using AOS/VS on your system. It covers many of the topics described in this manual, and gives you hands-on experience with the system without your having to worry about making mistakes. You also have an on-line Help system with the Starter and SMI programs, which you can use to get information at any time. We will describe the Help system, the tutorial, and how to use menus and command screens later in this chapter.

The AOS/VS File System

Before you get AOS/VS running on your system, it will be helpful for you to understand the AOS/VS file system. If you are a system user — not performing any system management functions — dealing exclusively with CEO or an application program, you might not need

to worry about AOS/VS files. However, an introduction to the method AOS/VS uses to store data would be useful for most system users.

AOS/VS stores information for you in *files*, which reside on portions of the disk. You specify a filename for each file, and AOS/VS uses this name to keep track of where the file is on the disk. You use the filename any time you need to refer to that file. Filenames can be from 1 to 31 characters long, and can contain any of the following characters: A - Z, a - z, 0 - 9, $ (dollar sign), _ (underscore), ? (question mark), and . (period). (Note that the system converts all alphabetic characters to uppercase, so it will not differentiate between FILE1 and file1, for example.) You can have files on diskettes or tape, as well as on the hard disk.

Directory Files and Data Files

There are many different types of files, but the two you will deal with most are directory files and data files. A *directory file* catalogs and contains information on other files, but it has no information of its own that you can use. You store your data files (and other directory or nondirectory files) in a directory.

Think of a directory as a bookcase in a library, and data files as books. One bookcase unit can contain one or more shelves for holding books. Therefore, you can have a small bookcase (directory) containing just books (data files) on one shelf. Or you can have a big bookcase (directory) holding both books (data files) and several other shelves (subordinate directories) with their books (data files). AOS/VS allows you to have up to eight levels of directories, not including the root directory. (We will define the root directory momentarily.)

The organization of all directories on a system makes up a network resembling an upside-down tree with the root at the top. For example, look at Figure 1-5.

The *root* directory, filename :, is the top directory in the AOS/VS file system. It contains all other files. Three of the directories subordinate to the root are PER, which contains files for each of the system's peripheral devices (such as the printers and consoles), UTIL, which contains system utilities (such as text editors), and UDD, which is the User Directory Directory and contains a directory for each system user.

In our example, we show one user's directory, CHRIS, located in the UDD directory. For a multiuser system, the UDD directory will contain many subordinate directories, at least one for each user.

Pathnames

When you work within the AOS/VS file system, you are always positioned in a directory. The directory you are positioned in at any given time is your *working directory*. The default working directory (that is, the directory that will be your working directory unless you specify otherwise) is your own username directory. Therefore, using our example above, user Chris's working directory will be CHRIS. Chris can refer to any file in the working directory, such as FILE2, using a *simple* filename, that is, the filename alone — FILE2. But if Chris makes :UTIL the working directory, for example, then FILE2 can only be referred to via a *pathname*.

A pathname is merely a name showing the directory structure from the working directory to the file. A *full pathname* is a name that shows the directory structure from the root directory to the file, in this case, :UDD:CHRIS:FILE2.

1-6
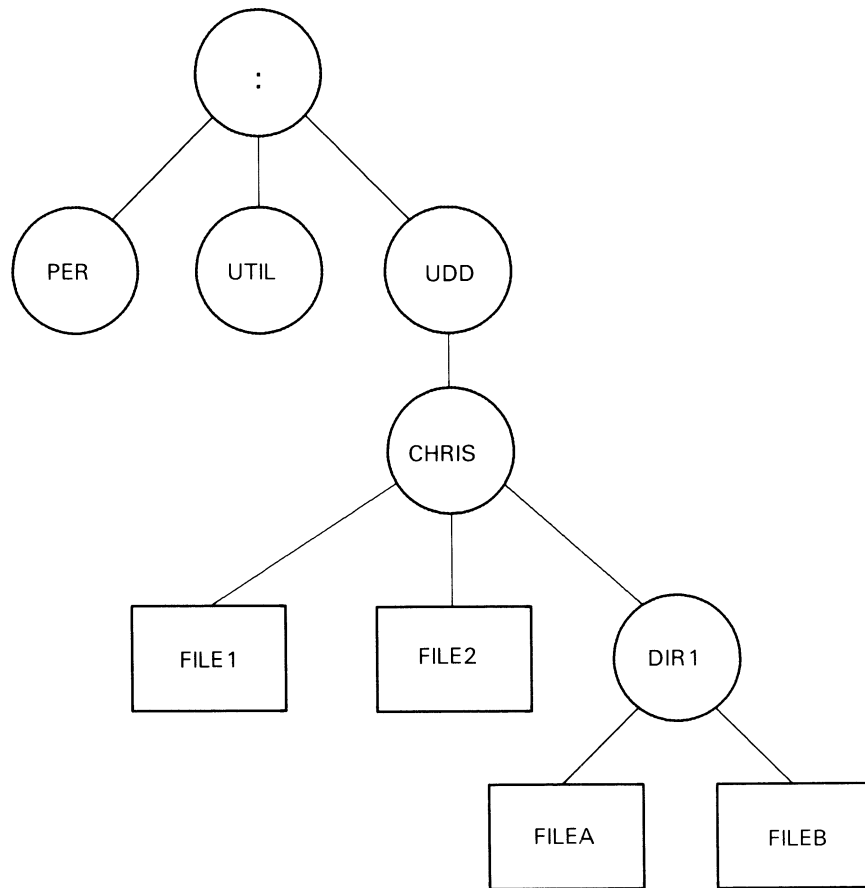
ID-03578

Figure 1-5. A Directory Tree

(Note that you can type filenames and pathnames in either upper- or lowercase, or any combination of the two; both :udd:chris:file2 and :UDD:Chris:FILE2 are acceptable pathnames identifying the same file.)

For more information on files, pathnames, and the AOS/VS file system, see the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)*.

Template Characters

As we mentioned earlier, to refer to a file, you specify its filename. Or you can specify just part of a name by using a *template*. A template is a character that matches certain characters or specifies where to search for files. We list the templates in Table 1-1.

Table 1-1. Template Characters

Template Character	What it Means
*	Match any single character except a period.
–	Match any series of characters not containing a period.
+	Match any series of characters.
\	Omit a filename or filenames (specified after the backslash, possibly including template characters).
#	Search in the specified directory and in all subordinate directories. Without this template, the search is restricted to the working or specified directory.

For example, suppose user Robin has a directory in :UDD:ROBIN called CUSTOMERS, and this directory contains files ADAMS, ADKINS, ARMSTRONG, and ATWATER, among others. If Robin specifies AD+, the search will find ADAMS and ADKINS. If Robin specifies A+, the search will locate all four above-mentioned files. For more information on templates, see *Learning to Use Your AOS/VS System*.

What Is the System Console?

As you read the instructions for starting up the system, in the next chapter, you will find references to the *system console*. The system console is the terminal that will display diagnostic messages, and from which you will bring up AOS/VS.

The system console can be a hard-copy terminal, a graphics terminal, or any other terminal that you have attached to an appropriate printed circuit board. Appropriate boards are the system board (or processor) on the ECLIPSE MV/2000 DC, and the system board or a video memory board (VMB) on DS/7000-series systems. If you have more than one appropriate board, you can change which terminal you use as your system console. The "Change Preset Values Menu" section of Chapter 5 has information on how to do this. We suggest that you do not attempt to change the system console until after you have powered up the system once and are familiar with it.

NOTE: If you will be using a hard-copy terminal to run the Starter and SMI programs, see Appendix C, "Using a Hard-Copy System Console." It describes the differences between using a display terminal and a hard-copy terminal to run Starter and SMI.

Control Sequences and Special Keys

While running the system, you should be aware that there are keyboard control sequences and special keys that do things like govern console display and interrupt program execution. You might need to use some of these keys, and you should be aware of what will happen if you accidentally type one of them.

To enter a control sequence, first press the CTRL key; then, while holding CTRL down, press the other key in the sequence. Table 1-2 lists the control sequences and special keys and their functions.

Table 1-2. Control Sequences and Special Keys

Key(s)	Function
CTRL-S	Suspends console display; that is, it freezes your screen. To resume display, type CTRL-Q. The CTRL-S/CTRL-Q sequence is useful when you want to display long files on the terminal screen and the screen is scrolling too quickly.
CTRL-Q	Resumes console display suspended by CTRL-S. Also scrolls a screen that is in Page Mode.
CTRL-U	Erases the current input line. CTRL-U is often easier than using the delete (DEL) key repeatedly to erase a long input line.
CTRL-D	Terminates the current keyboard input operation. (End of File from keyboard.)
CTRL-O	Discards all output sent to the console until a subsequent CTRL-O is issued.
CTRL-C CTRL-A	Interrupts and restarts dialog in some programs. Also interrupts execution of AOS/VS CLI commands. (We describe the CLI in a later section.)
CTRL-C CTRL-B	Immediately terminates the current program process in AOS/VS, such as the CLI, the System Management Interface (SMI) program, or a text editor.
DEL key	Erases the last character typed. If you are using a hard-copy terminal, DEL echoes as an underscore (_).
BREAK or BRK or CMD-BREAK	Unless disabled, gives control to the SCP CLI. Chapter 7, "What if Something Goes Wrong?," explains what to do if you enter the break sequence by mistake.

Function Keys

Like the control sequences, function keys on your terminal perform specialized functions, depending on when you use them. Figure 1-6 shows the location of the function keys on the keyboard of a DASHER D210, D211, D410, D411, D460, or D470 terminal.
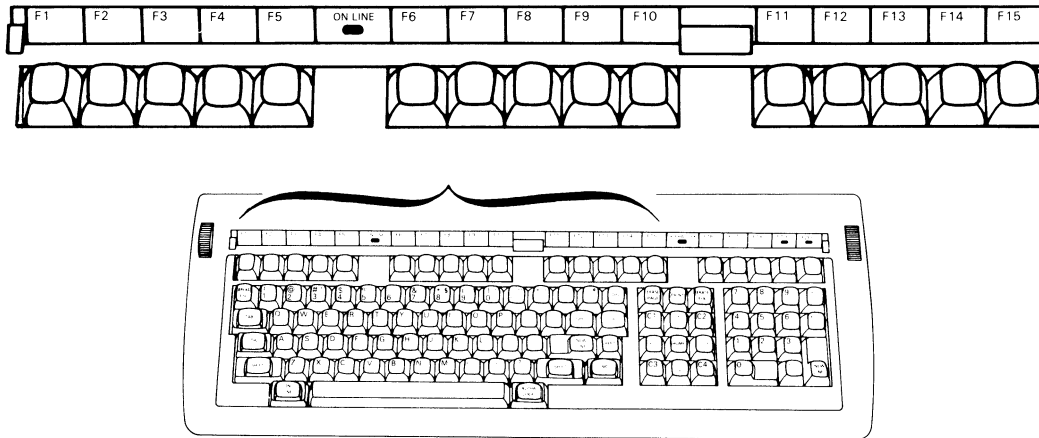
DG-26459

Figure 1-6. Location of Function Keys

The function keys are numbered from left to right, with the leftmost key being F1. Some of the function keys are used in conjunction with the SHIFT and/or CTRL keys to perform a function. The Starter and SMI programs that we describe in this manual recognize several function keys. Table 1-3 lists them.

Table 1-3. Useful Function Keys

Key	Name	Function
F1	Execute	Enters all data currently displayed in the fields of a command screen.
SHIFT-F1	Help	Displays Help text about the current menu or input field.
F3	Previous Screen	Scrolls back to the previous screen. Used with displays of Help text.
F4	Next Screen	Scrolls ahead to the next screen. Used with displays of Help text.
SHIFT-F4	Begin/End Line	Moves the cursor to the beginning of the line. If the cursor is already at the beginning of the line, moves it to the end of the line.
F7	Insert Space	Inserts a space (a blank) at the cursor position.
F8	Delete Character	Removes the character at the cursor position.
F9	Delete	Erases any text in the input field at which the cursor is positioned on a menu or command screen.
SHIFT-F9	Delete Word	Removes the word that the cursor is positioned on.
F11	Cancel/Exit	Exits from the current menu or command screen and returns to the previous screen.
SHIFT-F11	Back Field	Returns to the previous input field in a command screen.

Figure 1-7 shows the location of these keys on your keyboard.

F1: Execute
SHIFT-F1: Help

F3: Previous Screen

F4: Next Screen   F8: Delete Character

SHIFT-F4: Begin/   F9: Delete
End Line   SHIFT-F9: Delete Word   F11: Cancel/Exit
SHIFT-F11: Back Field

F7: Insert Space
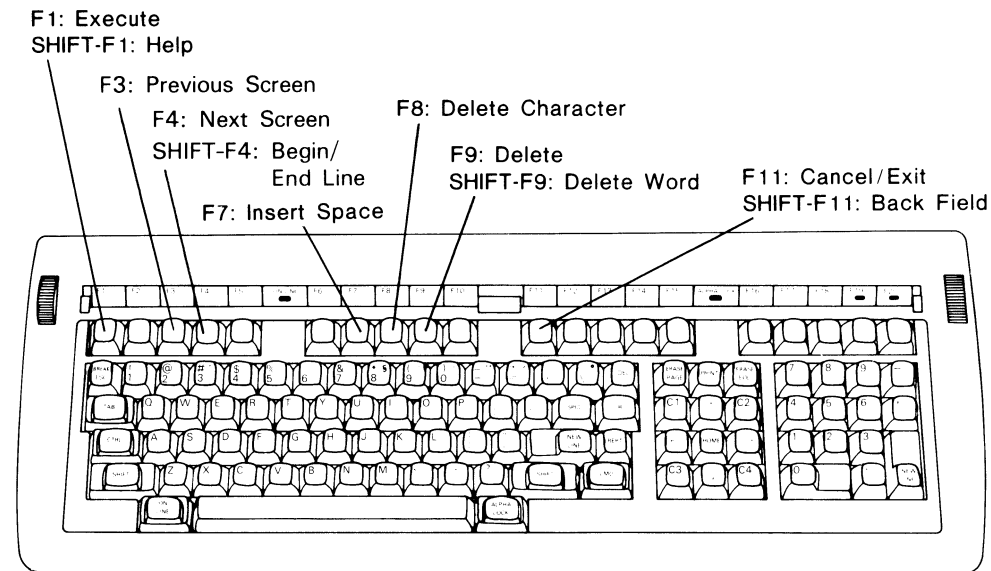
DG-27589

Figure 1-7. Useful Function Keys

The descriptions in later chapters of this manual explain specific situations in which these function keys are useful. Their meanings will be clearer to you when you see them in context.

What Is the CLI?

The Command Line Interpreter (CLI) is a command language that you can use while running AOS/VS, to issue commands to the computer. The CLI has built-in commands that you can enter, using a specific format, to do a number of functions including

- Creating or deleting files.

- Compiling, linking, or running programs.

- Setting or displaying the status of CLI environment parameters.

- Copying files to tape or diskette, or loading files from tape or diskette.

- Controlling processes.

- Managing the system.

Many of these functions you can also perform from menus once you get AOS/VS running on your ECLIPSE MV/2000 DC or DS/7000-series computer, as you will discover in the next few chapters. You can also enter the CLI via an menu option, or by typing the CLI keyword while at any SMI menu. (See the section "Using Keywords," later in this chapter.)

For complete information on the CLI, see the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)*. In addition, *Learning to Use Your AOS/VS System* has a chapter called "A Session with AOS/VS," which is a helpful introduction to the CLI once you have entered it.

We recommend that you work with AOS/VS from the menus described in this manual as much as possible, rather than using the CLI, at least until you have become more familiar with your system.

Using the System Menus and Command Screens

One of the features that makes AOS/VS on MV/2000 DC and DS/7000-series systems easy to use is the collection of menus and command screens that appear during powerup and while you run the Starter and SMI programs. If you have used software such as CEO, you will already be familiar with menus; but we recommend that you read through this section regardless. The Starter and SMI menu systems aren't identical to that of CEO.

Using Menus

A menu is a screen that contains anywhere from two to nine (rarely more) options, from which you must select what you want to do next. The menus you will see on starting up your ECLIPSE MV/2000 DC or DS/7000-series system offer many functions that you would otherwise be able to perform only by using the AOS/VS CLI or System Control Program (SCP) CLI. The menus make these functions much easier to perform.

Figure 1-8 shows a sample menu, which resembles the menus you will see after you start up your system.

069-000129

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│     Program Name Rev nn.nn.nn.nn                    dd-mmm-yy hh:mm    │
│                                                                       │
│                            Sample Menu                                │
│                                                                       │
│     => 1 First menu option                                            │
│          2 Second menu option                                         │
│          3 Third menu option                                          │
│          4 Fourth menu option                                         │
│          5 Fifth menu option                                          │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│     Enter choice: 1                                                   │
│                                                                       │
│                                                                       │
│     To exit from any menu, press the Cancel/Exit key (F11).           │
│     For assistance at any time, press the Help key (SHIFT-F1).        │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 1-8. Sample Menu.

The top line of the menu is called the *status line*. On Starter and SMI menus, it reports the revision of the program that you are running, as well as the current system date and time. Note that the date and time are updated only when the screen is refreshed; that is, when a new screen comes up, or when you press the ERASE PAGE key.

After the "Enter choice:" prompt on each menu, you will see an option number. That option is the *default* option; that is, the option you are most likely to want at that particular time. Depending on the menu, the "Enter choice:" prompt will appear either like the prompt in Figure 1-8, or like the following:

Enter choice [1]:

On some menus, there will also be an arrow (like =>), which points to the option appearing as the default. We call this arrow the *menu cursor*. In Figure 1-8, option 1 is the default.

Selecting Menu Options

To accept the default menu choice, just press NEW LINE. To select any option on a menu, type its number and press NEW LINE. Alternatively, you can use the arrow keys, also known as Cursor Up and Cursor Down, to move the menu cursor to a different option. For example, suppose the default is option 1. To select option 2, you can either type 2, or you can press the downarrow key once. The menu cursor will move down so it is

positioned next to option 2, and a 2 will appear after the "Enter choice:" prompt. To tell the system that this is the option you want, press NEW LINE.

If you select an option that isn't on the menu (for example, 6 in the sample menu in Figure 1-8), you will get an error message that prompts you to enter a valid choice.

Exiting from Menus

Should you ever look at a menu screen and decide you don't want to select any of its options, you can exit from the menu by pressing the Cancel/Exit key (F11). F11 is the eleventh function key, counting from the left, on the row of function keys at the top of your keyboard.

Pressing F11 will do one of the following:

• Return you to the previous menu screen, if there is one to which you can return.

• Present an intermediate screen showing what will happen if you continue the Cancel/Exit function. (This will happen if you are trying to exit from a menu for which there is no previous menu to return to.)

In the second instance, you can return to the menu from which you pressed Cancel/Exit, if you decide you don't want to continue the Cancel/Exit function. The intermediate screen will tell you how to do this.

NOTE: On the first few powerup menus you receive, you can also use the ESC key to exit from the menu. This is to accommodate users who are bringing their systems up on hard-copy terminals, which don't have function keys. While running Starter or SMI on a hard-copy terminal, use the ESC-C sequence to perform the Cancel/Exit function (press ESC; then press C).

Using Command Screens

A command screen is a screen that contains one or more prompts, at which you are expected to enter information. You might have to tell Starter or the SMI some information about your system, or specify a certain printer or queue that you want to use, or type values such as the date and time.

Command screens often contain default values after the prompts, like the menus do. Figure 1-9 pictures a sample command screen, with default values filled in.

```
Program Name Rev   nn.nn.nn.nn                          dd-mmm-yy hh:mm

                          Sample Command Screen

       Command screens sometimes have some introductory text
       before the prompts.

       First prompt:  DEFAULT ANSWER 1

       Second prompt:  DEFAULT ANSWER 2

       Third prompt:  DEFAULT ANSWER 3




       To exit from any menu, press the Cancel/Exit key (F11).
       For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 1-9. Sample Command Screen

Like the menus, the command screens display a status line at the top of the screen, and information on exiting the screen and getting help at the bottom of the screen.

The places on each command screen at which you can enter information are called *input fields*. Most input fields require you to enter a value; but on some command screens, you can enter a null string.

To accept any default response, just press NEW LINE while at the prompt. To enter a different response, type over the default response, and erase any extra characters by pressing ERASE EOL or the space bar the necessary number of times. Or you can press CR, which will erase to the end of the line and place the cursor at the next input field. (CR functions the same as if you had pressed ERASE EOL and then NEW LINE.) To enter a null string, press CR while at the first character position of the input field, or press ERASE EOL and then NEW LINE.

You can use the arrow keys to move between input fields. For example, if you answered the first and second prompts, and then decided to change your response to the first, you could press the uparrow key, which will move the cursor back to the previous input field. Similarly, you can proceed to the next input field by using the downarrow key instead of NEW LINE or CR.

At any command screen, you can press the Execute function key (F1) from any prompt on the screen to indicate that all values currently displayed are correct. For example, if

the screen comes up and you type your response for the first field, and want the default responses for the remaining input fields, you can press Execute instead of NEW LINE at the first prompt. Or you can press NEW LINE, and then press Execute at the second or any subsequent prompt.

Getting Help

At times, you might receive a menu that has options you don't entirely understand. Or there might be an input field on a command screen for which you aren't sure what information to enter. If this happens, you can either consult the appropriate portion of this manual, or for a quick explanation of your options at any time, you can press the Help key, SHIFT-F1 (press and hold the SHIFT key; then press F1).

If you are positioned at a menu screen when you request help, the on-line Help system will supply a brief explanation of the menu's options, designed to help you make your selection immediately. If you pressed the Help key while at a command screen, the help screen will apply directly to the input field you were positioned at when you requested help. We describe the Help system in more detail later in this chapter.

Using Keywords

As you become proficient with the menus, you will find that they branch and make up many different menu paths. Figure 1-10 shows a sample set of menus and the menu structure.

Suppose, using Figure 1-10 as a guide, you are positioned at Menu F, and you want to perform a function that is on Menu E. Using the method we described earlier, you would have to press Cancel/Exit once to get to Menu C, press Cancel/Exit again to get to the Main Menu; then select option 1 to get to Menu A, and option 4 to get to Menu E. Then from Menu E you could select the option you wanted. You might find this method too time-consuming.
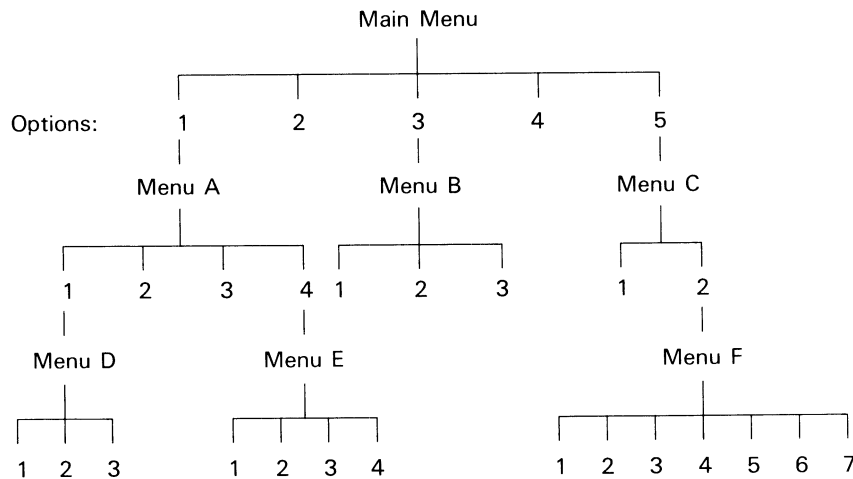
ID-03581

Figure 1-10. A Menu Structure

069-000129

Alternatively, you can get to any menu or menu option by entering a *keyword*. There are *menu keywords* and *command keywords*. A menu keyword places you in a certain menu screen, where you can choose an option, while a command keyword selects a certain menu option and places you in a command screen, where you can enter information to execute a command. In either case, when you exit the menu or command screen, you will return to wherever you were when you issued the keyword.

Appendix B (also duplicated on a tear-out card at the end of this manual) is a list of all the applicable keywords and the screen where each keyword places you. These keywords and screen names will mean more to you after you have read the next two chapters.

NOTE: Some menus and menu options are restricted to System Managers only. The keywords for these menus and options will work only if you have the necessary privileges. Chapter 3 deals with privileges and user profiles in more detail. Be sure to read Chapter 3 before attempting to use restricted keywords.

For example, using the diagram in Figure 1-10, suppose the keyword for Menu E is PRINTERS. If you currently have Menu F (or any other menu) on your screen, all you have to do is type PRINTERS and press NEW LINE, and you will be at Menu E.

As an example of a command keyword, suppose you want to send a message to all users, but don't want to bother going through the menus and prompts to get to the menu option "Send a message to all consoles." One of the keywords listed in Appendix B is BROADCAST. You could enter the keyword BROADCAST by itself, as follows:

Enter choice: BROADCAST ⌡

This will bring up the Send a Message to All Consoles screen, at which you could type your message. Alternatively, you could enter an entire keyword command string, for example:

Enter choice: BROADCAST The system will be coming down in 5 minutes. ⌡

This string consists of the keyword command (BROADCAST) and its *arguments*, the words that compose the message you want to send to everyone. It lets you send the message without bringing up the Send a Message to All Consoles screen, allowing you to remain at your current position in the menu structure.

Note that if you do enter an entire string in this way, you must be sure you know the command keyword and argument(s) that the system expects. For some command keywords, the system needs several pieces of information. With any command keyword, you can enter one, some, all, or none of the required arguments. If you don't enter all required arguments, the system will present the command screen for you to fill in the remainder of the information. The arguments you have supplied will already be entered onto the screen, as long as you have not supplied more than the command accepts.

Note that you can enter keywords in upper- or lowercase, and you can abbreviate them to minimal uniqueness; that is, you can use the fewest number of characters that uniquely identifies that keyword. For example, three of the keywords for the SMI program are CONFIGURE, CONSOLES, and CONTINUE. These are the only three keywords beginning with CON, so you can abbreviate them to CONF, CONS, and CONT, respectively.

The SMI program has two keywords that do not bring up an SMI menu or screen: CLI and BYE. The CLI keyword places you in the CLI, where the CLI prompt will look like this:

SMI_CLI)

The BYE keyword allows you to exit from the SMI. If you entered the SMI from the CLI, then you will return to the CLI. If you entered the SMI at logon, you will be logged off the system.

What Do You Want to Do?

Different portions of this book will be useful to different types of system users. Specifically, there are two audiences for this manual: the regular system user, and the system user who will be responsible for performing system management tasks. We refer to the latter user as the system manager for simplicity, although we realize this user may not actually have such a title.

In this manual, each chapter and some chapter sections are preceded by a key that shows which type(s) of user the chapter or section is intended for.

The System User

System users who will run only a job-specific application program, and who won't deal at all with the AOS/VS file system, won't need this book; they will just need instructions for the application they will be using. However, users who will be working on the ECLIPSE MV/2000 DC or DS/7000-series system and using AOS/VS files will need to read parts of this book. These users will be concerned with part or all of the following chapters: 1, 3, 4, and 7. If you are this type of user, read only the sections of these chapters that are marked as appropriate for the system user. For example, the beginning of this chapter indicates that the entire Chapter 1 is appropriate for both system users and system managers.

In addition, if you will be using the CLI, you should see the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)*. If you will be a CEO user, see *Getting Started with the CEO® System* and other CEO documentation as needed.

The System Manager

If you will be performing system management tasks, you might need to read this whole manual. You may, however, be performing only a few specific system management tasks, in which case you can refer to just the sections that apply to those tasks.

For some system management tasks, this manual is just a takeoff point. *How to Generate and Run AOS/VS* describes AOS/VS system management in detail. Note, however, that it does not deal with the menu-driven interface. *How to Generate and Run AOS/VS* is also a much more technical reference manual than the manual you are reading now; it would be a good idea to go through this entire manual and *Learning to Use Your AOS/VS System* before jumping into *How to Generate and Run AOS/VS*. At the least, you should be familiar with the CLI before doing so.

Bear in mind that, as you proceed with your system powerup and management tasks using the menu-driven interface, you always have three sources of help:

- This manual

- The on-line Help system

- The interactive system management tutorial

The next two sections describe the Help facility and the tutorial.

The On-Line Help Facility

During the powerup procedure, you can get an explanation of your options at any menu or other input screen by requesting help from the on-line Help facility. Help is available from the moment the Automatic Program Load Menu appears during the powerup. Getting help does not interrupt activity in progress; when you are finished viewing help screens you will return to exactly where you were when you requested help.

The help is context sensitive; that is, the text on the help screen will be directly related to what you were doing when you requested help.

Requesting Help

To request help during the powerup procedure, press the Help function key, SHIFT-F1. (F1 is the leftmost function key at the top of your keyboard. Press and hold the SHIFT key; then press F1, and the help screen will appear.)

Figure 1-11 shows the location of the Help key on your keyboard.
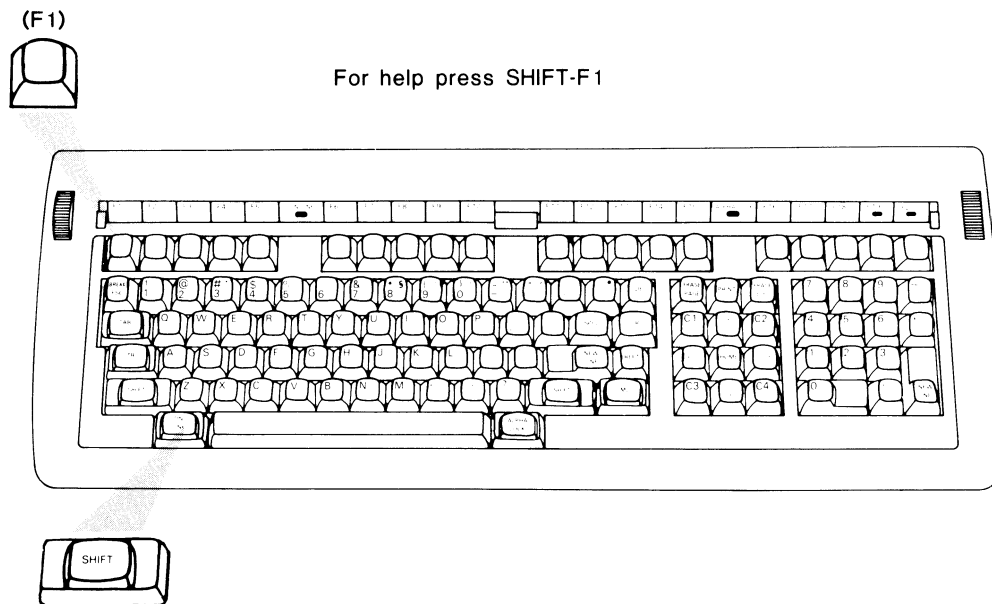
DG-26437

Figure 1-11. The Help Key

NOTE: For the early powerup menus (that is, the Automatic Program Load, Change Preset Values, Operating System Load, and Technical Maintenance menus) you can also request help by pressing H. This option is to accommodate people using hard-copy terminals, which don't have function keys, for powerup. Chapters 2 and 5 describe these menus.

If you are using a hard-copy terminal to run Starter or the SMI, use the ESC-H sequence to request help. (See Appendix C for details.)

After you view the help screen or screens, you can press the Cancel/Exit key to return to whatever screen you were at when you requested help.

Scrolling the Help Display

Some help displays are more than one screen long. When this is the case, you will see the first help screen and can then choose if you want to continue viewing help or return to where you were when you requested help. Similarly, if you are at the second or subsequent help screen, you can scroll the help back to a previous screen.

To scroll a help display, use the Previous Screen and Next Screen function keys (F3 and F4, respectively). When you press F4, the system will scroll the help display one screen forward. This function key will not work if you are viewing the last screen of the help display. When you press F3, the system will scroll the current help display back one screen. This allows you to review the help you saw just previously. The Previous Screen key will not be functional if you are viewing the first screen of the help display.

The Interactive System Management Tutorial

AOS/VS on ECLIPSE MV/2000 DC and DS/7000-series systems comes with an on-line tutorial, which you can use to learn about AOS/VS on your computer and to practice using the menus and various system management functions. The tutorial consists of several different lessons, which you can go through at your own pace and in any order you like. For your first time using the tutorial, we recommend that you proceed through the lessons in the order they appear on the tutorial's menu. For review purposes, you might want to skip around between lessons. You can make your tutorial sessions as long or as short as you want.

The tutorial has lessons on powerup and shutdown, performing backups, and managing users, among others. It includes optional practice sessions for using menus, and simulated Starter and SMI programs. The tutorial will allow you to become familiar with system management tasks before you actually perform them. You might find it helpful to use the tutorial and this manual together. You can run the tutorial version of Starter or SMI, and actually see and use the menus while reading about them. Using the tutorial versions of these programs, you can experiment and make mistakes without doing any harm to the system or your files.

Since your system must be up and running for you to use the tutorial, you will rely on this manual for your first time powerup. Once your system is running, however, you can explore your options with the menu-driven interface by using the tutorial. We describe how to start up the tutorial from the SMI in Chapter 3, "Managing the System."

The Rest of this Manual

The remainder of this manual deals with a variety of subjects. The following lists what chapter(s) to refer to for what you want to do.

If you want to	Refer to Chapter or Appendix
Power up your system and bring up AOS/VS.	2
Learn about system security, perform system management functions, or learn about the System Management Interface (SMI) Program.	3
Back up (save) files or restore previously backed up files from diskette or tape.	4
Change the preset powerup values or perform advanced technical maintenance functions for which you would interrupt the normal powerup sequence, or learn how to improve your system performance.	5
Communicate with another system using the XODIAC™ networking system.	6
Find how to handle an error situation.	7
Reinstall the operating system on the disk if the disk has been damaged.	A
Find the keyword for a Starter or SMI function.	B
Learn how Starter and SMI work on a hard-copy terminal.	C

See the Preface of this manual for references to other manuals that you might find useful. Refer to the Glossary if you encounter terms that you are not familiar with.

End of Chapter

Chapter 2
Starting Up the System

This chapter is for the

System Manager	✔
System User	

Once your MV/2000 DC or DS/7000-series computer is unpacked and set up, you are ready to turn on the power and bring up AOS/VS. Powering up is an easy procedure with very few steps. The descriptions in this chapter cover first-time startup and subsequent normal startup for MV/2000 DC and DS/7000-series systems. We discuss the advanced functions that you can perform during powerup in Chapter 5.

AOS/VS Installed on the Disk

Before you can run AOS/VS, you must *load* it into your computer's memory. The hard (or Winchester) disk that you received with your MV/2000 DC or DS/7000-series computer has the AOS/VS operating system installed on it; therefore you will load AOS/VS into your computer's memory off the disk instead of from diskettes or tape. This means that you should have a relatively fast and easy powerup.

The MV/2000 DC and DS/7000-series systems have a diskette drive and/or a tape drive. You can use tape or diskettes (also known as floppy disks) to load other software, such as the Advanced Diagnostic Executive System (ADES) or the Comprehensive Electronic Office (CEO), onto the system. You also have AOS/VS on diskettes or tape, depending on which you selected as your release medium when you purchased AOS/VS. You could load the operating system from these diskettes or tapes if something were to go wrong with the hard disk. We describe this procedure in Appendix A, "Reinstalling AOS/VS If the Disk Is Damaged." You would also load AOS/VS from media if you received a new revision of AOS/VS.

Powering Up

In this section, we describe how to start up your system. During powerup, diagnostic test programs run automatically and AOS/VS will come up automatically. You have to do very little besides keep an eye on things. To start up the system, just follow these steps:

1. Turn on the terminal you will use as the system console, and all other terminals and printers on the system.

2. Turn on the power button on the computer's front panel.

That's all it takes to start up the system. (These steps assume that none of the diagnostic programs finds a problem, and your disk with pre-installed AOS/VS is not damaged.) After these two steps, you'll either set the system's date and time (if this is your first time powering up) or just log on. We describe both of these procedures later in this chapter.

There are three points in the powerup at which you can speed up the procedure by pressing the NEW LINE key, rather than allowing the system to wait a predefined time-out interval. At each place you receive a menu that tells you about this option, and other options that you have at that point.

If you want more information about these menus, and about the diagnostic programs and powerup in general, the rest of this section describes powerup in more detail. Because the diagnostic programs behave somewhat differently on the different computers, we have divided the diagnostic section of powerup into three separate sets of steps, as listed below. You need only refer to the one that applies to your system.

- Powerup Diagnostics on MV/2000 DC and DS/7500-Series Systems

- Powerup Diagnostics on DS/7500-Series Systems (Graphics Terminal)

- Powerup Diagnostics on DS/7700-Series Systems

After these descriptions, we cover the powerup menus and bringing up the operating system in the section "Bringing Up AOS/VS." The events described in "Bringing Up AOS/VS" will occur immediately after the diagnostic programs that we describe in the three above-mentioned sections. We suggest that you read "Bringing Up AOS/VS" even if you decide not to read about the powerup diagnostics on your system. It explains how to set the date and time on first-time powerup and how to log on to AOS/VS.

If the powerup does not proceed exactly as described in this section, refer to Chapter 7, "What If Something Goes Wrong?".

CAUTION   It is important that you avoid pressing any keys during the diagnostic portion of the powerup procedure. Later in the powerup, the messages on the screen will tell you when you are expected to enter a response. In particular, be careful not to press the break sequence (CMD-BRK, BREAK, or BRK). If you accidentally press the break sequence during powerup, refer to Chapter 7 to see what you should do.

For your convenience, a tear-out sheet is located at the back of this manual, which summarizes the normal startup sequence. You might want to remove it and tack it up on the wall near your system console for future reference.

Powerup Diagnostics on MV/2000 DC and DS/7500-Series Systems

If the computer you are powering up is an MV/2000 DC, your system console will be a terminal cabled to the system board. This can also be the case if your computer is a DS/7500 system. In either case, follow the instructions in this section. If you are using a DS/7500-series system on which the system console is a graphics terminal, skip to the next section, "Powerup on DS/7500-Series Systems (Graphics Terminal)."

This description covers the diagnostic portion of the powerup sequence. We suggest that you read through this description once before you power up. Then keep it nearby to refer to during the powerup procedure. Follow these steps in order.

1. Turn on the terminal you will use as your system console, and the other terminals and printers that will be used on your system.

    You will notice that some terminals, such as the DASHER D460, emit a tone and the four red lights on the keyboard will light up. (These lights are located at the upper part of your keyboard, above the function keys.) A diagnostic message might then appear on the screen. For example, a DASHER D460 display terminal's message looks like the following:

    D460 Self Test OK

    (Note that if you are using a DS/7500-series system and have graphics terminals on the system, they will illuminate the lights and emit a tone, but will not print a message on the screen.)

2. Turn on the power by pushing in the green power button at the upper right corner of the front surface of your MV/2000 DC or DS/7500-series system. See Figure 2-1.

    NOTE: To turn on power to the computer unit if you are using a hard-copy terminal as the system console, press and hold the REPT key, and then press and hold NEW LINE. While holding both keys down, press the computer's power button in.

    If you are using a DASHER 6053 terminal as the system console, press and hold NEW LINE, and then press and hold the REPT key. While holding both keys down, press the computer's power button in.

    Note that the button will light up, and it will stay pushed in, when power is on. To turn the computer off, press the button again; the light will go out and the button will pop back out.

    Be sure power is on before you proceed with the powerup.

3. Watch your screen for powerup messages.

    As soon as your computer is receiving power, it will begin testing itself to be sure all its components are functional. Throughout this testing phase, you will receive messages on your screen, indicating how the powerup is progressing. First, the screen will be refreshed (that is, cleared). Then you will see the following:

    TESTING...
    *   Model # 8396; System Processing Unit (SPU)*

    The diagnostic programs will then sequentially print out the letters of the alphabet, followed by the digits 0 through 9, and the word PASSED if everything tests out okay. Each character that prints indicates a test that has passed.

Power Is Off

POWER

O   I

Power Is On

POWER

O   I
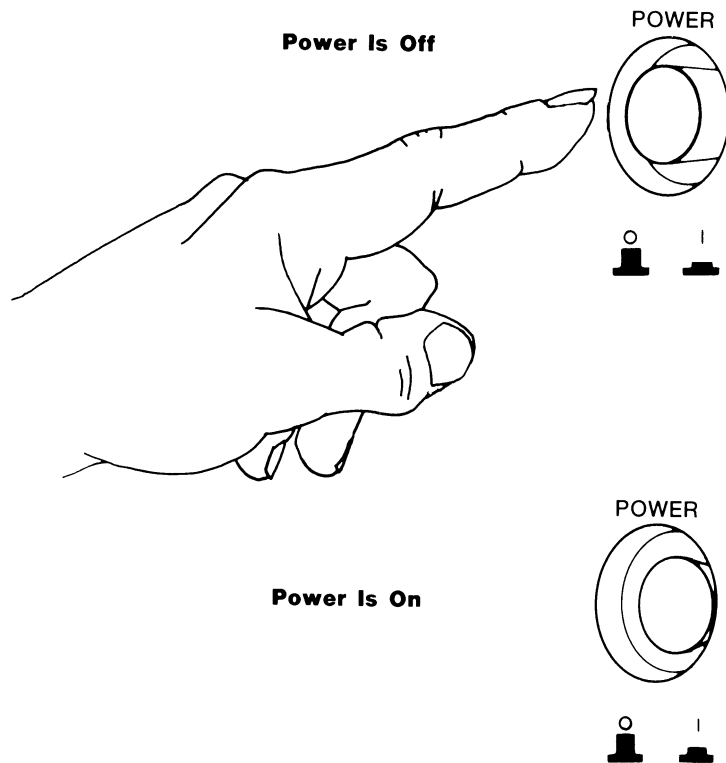
DG-27304

Figure 2-1. Turning on the Power on an ECLIPSE MV/2000™ DC or a DS/7500-Series System

When this first testing phase is complete, your screen will look like Figure 2-2.

```
TESTING...

   Model # 8396; System Processing Unit (SPU)
   ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED

   --  Standard  Hardware  Tests  Complete  --
```
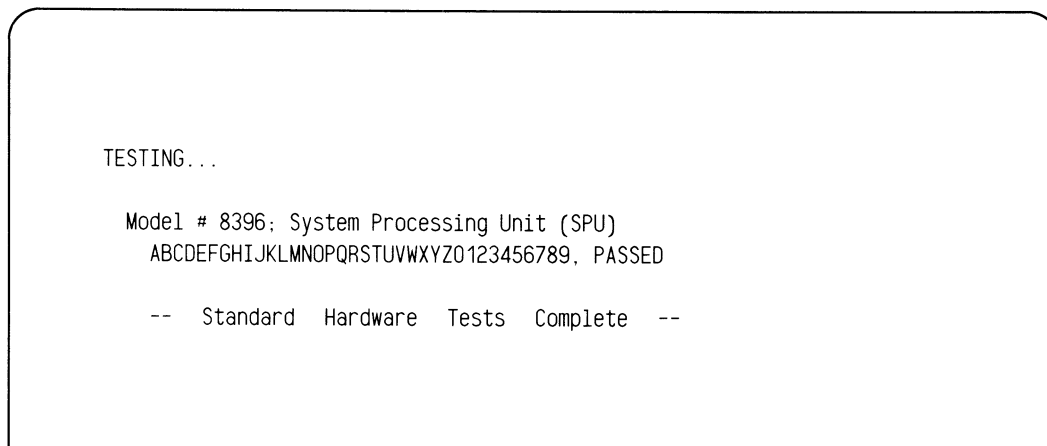
Figure 2-2. Standard Hardware Tests Screen

069-000129

Note that if the message does not print out exactly like this, then one of the diagnostic tests has probably failed. (If this happens, either you will see the message *FAILED* or the message will stop printing after a letter or number and will not print anything else for 5 minutes or more. Refer to Chapter 7, "What If Something Goes Wrong?," if either of these situations occurs.)

If you have purchased any optional communications boards (and/or video memory boards, if your system is a DS/7500-series system), diagnostic programs will now test them. The diagnostics will print out messages for the optional boards, similar to those it printed for the standard hardware. It will also indicate which slot inside the computer (A or B) each board is in.

In Figure 2-3 we show messages for every type of board; bear in mind that you will only see messages for those that you have. Note that the asynchronous communications board is an option only on the MV/2000 DC, and not on the DS/7500 system.

```
TESTING...

   Model # 8396; System Processing Unit (SPU)
      ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED


   -- Standard Hardware Tests Complete --


   -- Optional Hardware Tests Beginning --


   Model # xxxx; Slot y; Video Memory Board
      ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED


   Model # 4560; Slot y; Async Communications Board
      ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED


   Model # 4561; Slot y; Sync Communications Board
      ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED


   Model # 4562; Slot y; Local Area Network (LAN) Board
      ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED


   -- Optional Hardware Tests Complete --
```

Figure 2-3. Complete Set of Diagnostic Messages

The appropriate model number will appear for the type of video board you have, instead of xxxx, as well as the correct slot position for any board where we show y. If you receive messages different from those shown in Figure 2-3, or if a message stops printing after a letter or number and does not print anything else for 5 minutes or more, refer to Chapter 7, "What If Something Goes Wrong?".

Immediately after the test messages, you will see a line that displays your system's memory size. For example:

-- *Memory Size is 5 Megabytes* --

The powerup procedure to this point, with no errors, should take about a minute and a half. It should take less than a minute if you change the diagnostics sequence to run abbreviated diagnostics for subsequent powerups (as described in Chapter 5).

The diagnostic portion of the powerup sequence is now complete. To continue, turn to the "Bringing Up AOS/VS" section, which follows the section "Powerup Diagnostics on DS/7700-Series Systems.

Powerup Diagnostics on DS/7500-Series Systems (Graphics Terminal)

If you are powering up a DS/7500-series system, your system console will either be a terminal cabled to the system board, or a graphics terminal connected to the video memory board on your system. If this is your first time powering up, the system console will be on the system board, unless you have no terminal cabled to the system board, in which case the system console will be the graphics terminal cabled to a video memory board. For subsequent powerups, you can change the system console via the Change Preset Values Menu, described in Chapter 5.

If your system console is on the system board, your powerup will be the same as for the MV/2000 DC, and you should refer to the previous section, Powerup Diagnostics on MV/2000 DC and DS/7500-series Systems. If your system console is a graphics terminal, the indicators you see during powerup will differ from those of both the DS/7700-series and the MV/2000 DC systems. This section describes powerup on the DS/7500-series system using a graphics terminal as the system console.

Follow these steps:

1. Turn on the graphics terminal you will use as the system console, and any other terminals and printers you will use on the system.

    When you turn on any nongraphics terminals, each one will emit a tone, and the four red LED lights located above the function keys on each keyboard will light up. If the lights don't illuminate or the terminal doesn't beep, refer to Chapter 7, "What If Something Goes Wrong?".

2. Turn on the power by pressing the green button at the upper right corner of the computer. See Figure 2-1 in the earlier description for MV/2000 DC and DS/7500-series systems.

    The button will illuminate when power is on, and the button will stay depressed. To turn off the power, press the button again. It will pop back out, and the green light will go off. Be sure the power is on before you continue.

    When the DS/7500-series system receives power, the first thing you will see is a pattern over your entire graphics terminal screen. If you have a color monitor, the pattern will be white; if you have a monochrome monitor, the pattern will be green. This pattern might change randomly, and soon the screen will be refreshed, leaving a blank screen.

3. Watch the four red lights on your keyboard, or do something else for awhile.

As soon as the DS/7500-series system is receiving power, it begins testing all of its components to be sure they are functional. As it does this, it will send you indicators of the status of the diagnostic test programs. The keyboard lights are your first indicators. They are located at the upper part of your keyboard, above the function keys. The first is labeled ON LINE, the second is ALPHA LOCK, and the third and fourth are F19 and F20, respectively. These labels have no meaning during powerup diagnostics until the terminal is functional. The lights, however, are meaningful.

If you watch the red lights, you will see them flashing on and off in seemingly random patterns; however, they are actually indicating various tests that are occurring at each moment. You needn't worry about the significance of the lights that illuminate, unless an illuminated sequence remains steady for more than a few minutes.

If everything tests out correctly, output will begin going to your screen and the keyboard lights will immediately revert to their normal functions as part of the terminal. That is, the ON LINE light will be lit, and the ALPHA LOCK light will be lit if you have pressed the ALPHA LOCK key. If a few minutes go by and some of the lights remain lit when they shouldn't, or vice versa (for example, the ALPHA LOCK and F20 lights are lit, and the ON LINE and F19 lights are not), but the screen doesn't become functional, refer to Chapter 7, "What if Something Goes Wrong?". It will explain what the lights mean and what you should do.

If you aren't sure whether or not your keyboard lights have reverted to their normal functions, try pressing the ALPHA LOCK key a few times. The ALPHA LOCK light will light on and off if the lights are performing their normal functions.

4. Watch your screen for powerup messages.

If you have purchased any optional boards, such as an additional video memory board or communications boards, they will now be tested. The messages for these boards will appear on your terminal screen in the following format:

TESTING...

> *Model # xxxx; Slot y; Name of Option Board*
> *ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED*

where *xxxx* is the actual model number of the board, *y* indicates in which slot in the chassis of the DS/7500-series system the board resides (A or B), and *Name of Option Board* is either Video Memory Board, Sync Communications Board, or LAN Communications Board. (LAN is the abbreviation for Local Area Network.) Each letter of the alphabet and each digit that prints out on the following line indicates a diagnostic test that has passed.

For example, suppose you have a synchronous communications board in slot B of the chassis. You would receive the following message:

Model # 4561; Slot B; Sync Communications Board
> *ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789, PASSED*

If a diagnostic test does not pass, either you will receive a message that says *FAILED* and prints out an error code, or the line of alphabetic and numeric characters will just stop printing. If either of these things happens, refer to Chapter 7, "What If Something Goes Wrong?", for information on what to do.

After the optional board test messages, a line will display that shows your system's memory size. For example:

- - Memory Size is 5 Megabytes - -

The preliminary diagnostics are now complete. Turn to the section "Bringing Up AOS/VS" for information on what to do next.

Powerup Diagnostics on DS/7700-Series Systems

This section describes the diagnostic portion of the powerup sequence on the DS/7700-series system. We suggest that you read through this description once before you begin; then you can refer to it as you power up.

1. Turn on the terminal you will use as your system console, and all other terminals and printers that you will use on the system.

    If this is your first time starting up, the system console will be the terminal cabled to the system board, if there is one there. If there isn't, it will be the terminal cabled to the video memory board (if you have one). *You must have a terminal cabled to at least one of these boards.* You will be using this terminal as your system console. If you have a terminal cabled to each board, the one cabled to the system board will be your system console for the first time powerup. You can change it for subsequent powerups via the Change Preset Values Menu (as described in Chapter 5).

    When you turn on nongraphics terminals, each will emit a tone and the four red lights on the keyboard will light up. (These lights are located at the top of the terminal keyboard, above the function keys.) Then each terminal will print a diagnostic message on the screen. For example, a DASHER D460 display terminal's message is the following:

    D460+ Self Test OK

2. Turn on the DS/7700-series system's power by pressing the top portion of the power switch (marked **PWR**) on the upper right corner of the computer's front surface. See Figure 2-4.

    Note that the 0 on the top of the button disappears when you push it to turn the power on. The red light above the switch will illuminate when power is on. To turn off the power, press the bottom portion of the power switch.

    Be sure power is on before you proceed with the powerup.
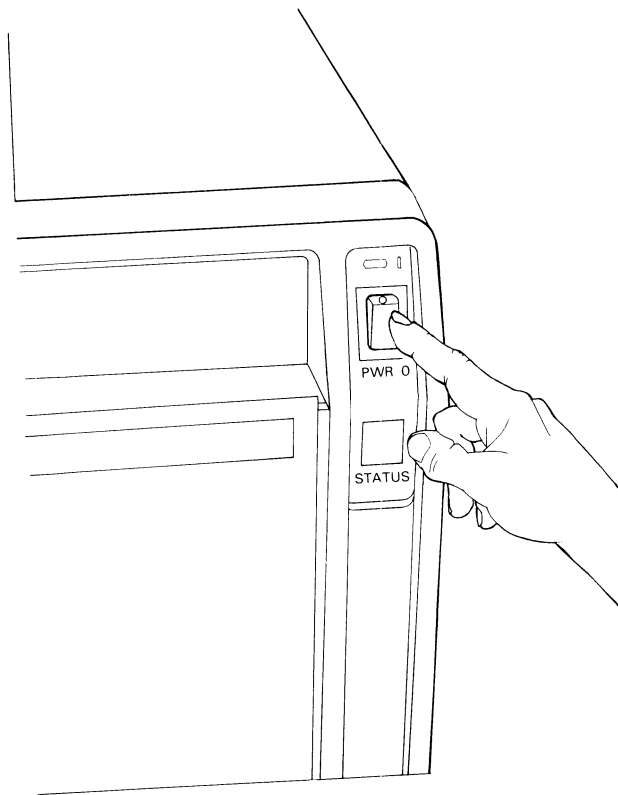
Figure 2-4. Turning on the Power on a DS/7700-Series System

3. Watch the seven-segment digital LED display on the front panel of the DS/7700-series system.

    Once you turn on the power, the system begins to test itself to be sure all of its components are functional. Throughout the entire testing phase, you will receive indicators of how the powerup is progressing. On a DS/7700-series system, the first indicator is the seven-segment LED (light-emitting diode) display on the computer's front panel. (See Figure 2-5.) This display is also referred to as a *digital display*. Table 7-2 in Chapter 7, "What if Something Goes Wrong?", lists the status and error conditions that the LED display might indicate. Note that MV/2000 DC and DS/7500-series systems do not have this LED display.

    Upon first receiving power, the LED display on the DS/7700-series system will illuminate the decimal point. If the decimal point doesn't illuminate within 1 second after you turn on the machine, then the system is not receiving power. (If after several seconds the decimal point isn't illuminated, refer to Table 7-2 in Chapter 7 for instructions on what to do.) The decimal point will stay lit as long as the machine is still receiving power.
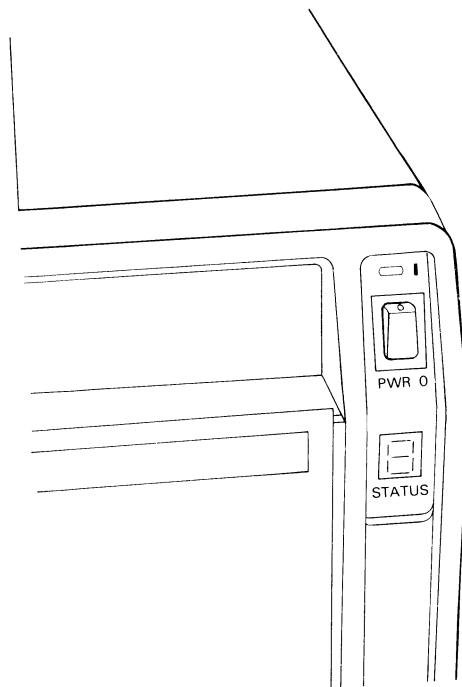
DG-27622

Figure 2-5. The LED Display on the DS/7700 Front Panel

Almost immediately after the decimal point lights up, you should see a 0 illuminate to the left of it, and then a 1, 2, 3, and 4 in quick succession. The 4 will stay lit for 2 to 5 seconds, and then various other numbers and letters — and possibly the same numbers again — will light up successively on the display. The display will probably change so quickly that you won't be able to discern the separate characters. But you needn't worry about the significance of any of these numbers or letters unless one remains lit for a long time. The displayed characters merely show what part of the system hardware is being tested at each particular moment.

If a number or letter — other than a lowercase b or d — does remain lit for more than about 5 minutes, refer to Table 7-2 in Chapter 7 to see what you should do. If the displayed character is b or d, then the system is indicating that it has identified the terminal you will use as the system console, and everything is fine. If the illuminated character is something else, there might be a problem; see Chapter 7, "What if Something Goes Wrong?".

Once the b or d lights up, indicating that everything is functioning normally, the system will immediately begin to communicate with you via the terminal screen. The letter on the LED display will remain lit until the operating system is loaded into the computer's memory. If, after the b or d illuminates, you don't see anything on the terminal screen, refer to Table 7-2 in Chapter 7 to see what you should do.

Which letter your LED display illuminates depends on which boards in your computer have terminals cabled to them. The following explains what b and d indicate.

If your LED display shows	Your system console is on
b	The system board.
d	A video memory board.

Unless you have specified during a previous powerup to which board the system console is cabled, the system will locate the system console using its own methodology. If both types of the above boards have terminals cabled to them, the system will locate the system console at the first terminal it finds, checking in the order shown above. For example, if you have a hard-copy terminal cabled to the system board, and a graphics terminal cabled to the video memory board, your system console will be the hard-copy terminal, provided you haven't specified otherwise on a previous powerup. During the powerup procedure, you can change the system console for future powerups, via the Change Preset Values Menu. We explain how to do this in Chapter 5, "Performing Advanced Functions."

4. Watch your screen for powerup messages.

Once the DS/7700-series system has located the system console, it will send diagnostic messages to the screen instead of to the LED display. What you will see on your screen depends on which optional boards you have purchased (if any), which boards have terminals cabled to them, and which board has your system console on it. There are a few different configurations you could have. For powerups other than the first, you might see different messages than you did the first time, if you have changed your system console.

Note that you won't necessarily see messages on the screen for all the boards you have. This may seem a bit confusing, but it will probably help if you understand *why* messages occur in this way. The system uses the LED display to indicate successful tests during powerup *only until* it locates the system console. Once it locates the system console, it begins sending messages to the screen instead. Therefore, you won't receive a message for each board in your system, because the LED display shows the status for some of them.

For example, suppose you have the system board and two video memory boards, and have a graphics terminal cabled to one video board, but no other terminals hooked up yet. The system will test the system board, find no terminal there, and then test the first video memory board. Suppose it finds the graphics terminal. It will make the graphics terminal the system console, the d will be lit on the LED display, and output will begin going to the terminal screen. So when the system then tests the other video memory board, you will receive diagnostic messages about this board on the graphics terminal screen.

Table 2-1 summarizes what messages you will see, based on the location of your system console.

Table 2-1. Diagnostic Messages Based on Location of the System Console

If your system console is on this board:	And you have these optional boards:	You will receive these messages:
System	None	None
	VMB (one)	VMB (two)
	VMB (two)	VMB (two)
Video memory (VMB)	VMB (one)	None
	VMB (two)	VMB (one)*

* Assuming the first VMB the system tested had a console. Otherwise, no message.

Message Formats

Diagnostic messages for optional video memory boards will look like the following:

TESTING...
   Model # xxxx; Slot y; Video Memory Board

where *xxxx* is the actual model number, and *y* indicates in which slot — A or B — of your system's chassis the board is located.

Following this message, the letters of the alphabet will print out, one at a time, followed by the numbers 0 through 9, and then the word PASSED. No more than 15 seconds should elapse between any two characters printing out.

If everything tests out correctly, your screen will look like Figure 2-6. (Note that the correct model number for the type of video board you have will appear instead of xxxx, and the slot letter — A or B — will appear instead of y.)

```
TESTING...

Model # xxxx; Slot y; Video Memory Board
   ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789,   PASSED
```
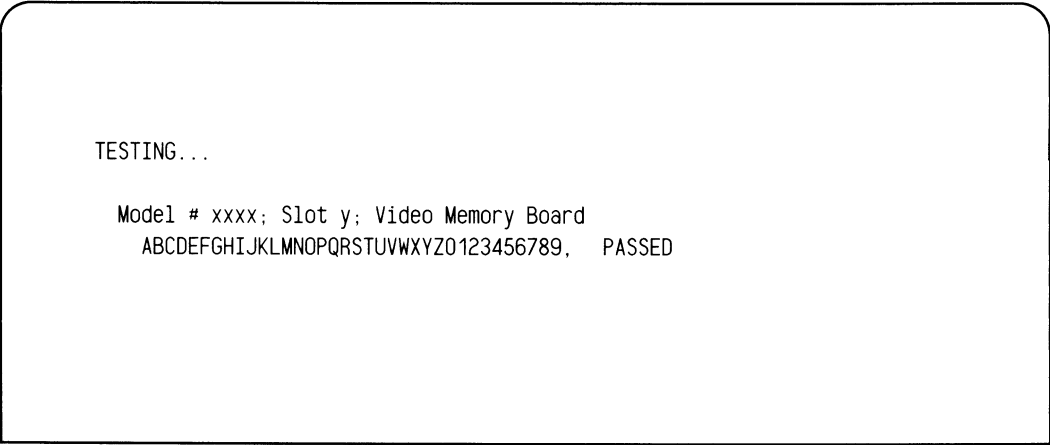
Figure 2-6. Optional Video Memory Board Test Message

Note that you might have an additional message if you have purchased two video memory boards.

If the powerup messages don't print correctly; that is, if any indicate *FAILED* or simply stop printing characters out for 5 minutes or more, refer to Chapter 7, "What if Something Goes Wrong?".

After the test messages, a line will display that shows how much memory your system has. For example, it might look like this:

-- Memory Size is 5 Megabytes --

The powerup procedure to this point should take about a minute and a half. Your system will then begin loading programs into the computer's memory. The next section, "Bringing Up AOS/VS," describes what to do next.

Bringing Up AOS/VS

Once the diagnostic programs are complete, you will begin to receive powerup menus. This section describes what the menus are for and what steps you must follow to bring up AOS/VS.

(Note that if you have purchased the complete Advanced Diagnostic Executive System (ADES) and loaded it onto your system, these diagnostic programs will now test your system's processor. This process will take 2 or 3 minutes. If this is your first time powering up, and you want to install ADES on the disk, we indicate in this sequence when you would do this.)

The next step in the powerup sequence after the diagnostic programs run is for the operating system to be loaded from the hard disk into the computer's memory. The machine does this by itself, but you will receive some menu screens while it is progressing. You don't have to respond to the menus unless you want to interrupt the normal powerup sequence to perform one of the advanced functions described in Chapter 5.

If this is your first time bringing up the system, we recommend that you don't interrupt the sequence (unless you have purchased the ADES diagnostics system and want to install it on your disk), but read through this section and remain by your system console during the powerup. If you have powered up before, you can leave the terminal for a few minutes and do something else, unless you want to interrupt the powerup to perform one of the advanced functions. In this section we explain under what circumstances you might want to do this.

After the diagnostic programs described earlier are complete, follow these steps:

1. Watch your screen for powerup menus.

   You can respond to the next two menus you receive, in order to continue the powerup without delay or to interrupt it to perform an advanced function. If you don't respond to the menus, each one will wait for a preset time-out interval, and then continue the powerup sequence automatically.

   If you want to avoid the time-out delays for these menus, or if you want to interrupt the powerup sequence, stay by your console. (Otherwise, you can go away for 5 minutes or so, and if everything goes normally, your system will be up and displaying a log-on banner when you return.)

   The first menu you will see is the Automatic Program Load Menu pictured in Figure 2-7. The terminal will also beep when it displays this menu, in case you have moved away from your terminal screen and don't see it.

```
                           dd-mmm-yy hh:mm:ss

                    Automatic Program Load Menu

        1 Continue immediately with preset values
        2 Change preset values

        Loading with preset values will continue automatically
        unless you respond within 45 seconds.

        The default device is hard disk

        For assistance, press the Help key (SHIFT-F1) or H

        Enter choice [1]:
```
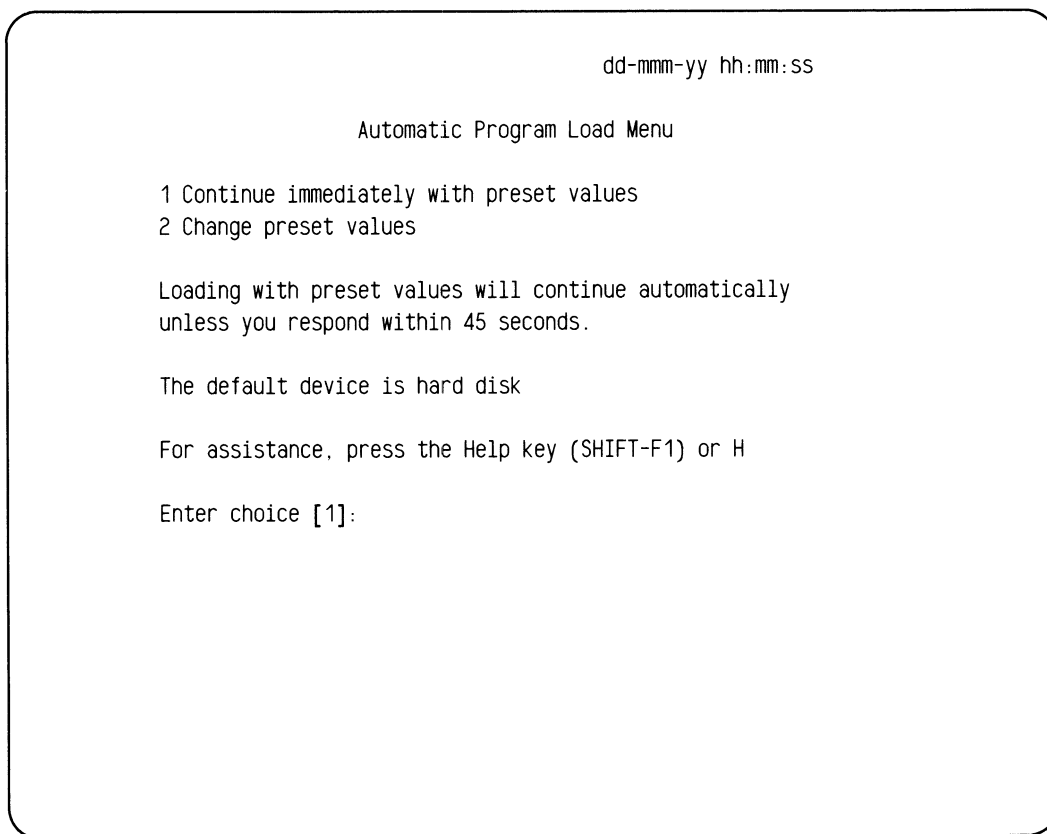
Figure 2-7. Automatic Program Load Menu

Note that your default device appears as the hard disk. This means that your system will attempt to start up your operating system from the hard disk. If you have changed the default device on a previous powerup, a different device will be displayed here.

On powerups other than the first, the time-out interval might appear as something other than 45 seconds, if you have changed it. You can change the time-out interval via the Change Preset Values Menu; we describe how in Chapter 5.

2. Decide what you want to do.

If you	The system will
Do nothing	Wait for a preset time-out interval (initially set at 45 seconds), and then continue the normal powerup sequence.
Press NEW LINE or type 1 and press NEW LINE	Immediately continue the normal powerup sequence.
Press SHIFT-F1 (HELP) or H	Display a Help screen.
Type 2 and press NEW LINE	Interrupt the powerup sequence and display the Change Preset Values Menu.

069-000129

You will want to interrupt the powerup sequence at this point only if one or more of the following is true:

- You want to set or change the system date and time (you can do this more easily later in the powerup sequence).

- You want to start a different device; that is, the programs you want to run are located on a device that is not the normal startup device. For example, your regular startup device is probably the hard disk (displayed on the Automatic Program Load Menu). You would want to interrupt the powerup sequence here if the programs you wanted to run were on tape or diskette instead of on the disk. If you have purchased ADES and want to run the diagnostic programs off tape or diskette, or if you want to install ADES on the disk, you will interrupt here to start from a different device.

- You want to change the regular startup device for subsequent powerups.

- You want to change the time-out interval for the Automatic Program Load Menu to be a value other than 45 seconds.

- You want to enter the System Control Program (SCP) CLI. (We caution you not to do this without the proper documentation.)

- You want to change the system console; that is, you want to bring the system up and manage it from a different terminal from now on. Note that, in order to do this, you must have a system board and a video memory board, each connected to a terminal, in a DS/7000-series system. You cannot change the system console if you are using an MV/2000 DC computer.

- You want to instruct the system to run an abbreviated set of diagnostic programs for subsequent powerups.

If you do want to perform one of these advanced functions, type 2 and press NEW LINE, and refer to the "Change Preset Values Menu" section of Chapter 5, which describes how you should continue.

For this description, we will assume that you choose to continue the normal powerup sequence.

3. Press NEW LINE, type 1 and press NEW LINE, or do nothing.

   If you do nothing, the system will continue after the time-out interval as if you had entered 1. The Operating System Load Menu, shown in Figure 2-8, will appear. This menu will also beep to alert you in case you have moved away from your terminal screen.

```
                                        dd-mmm-yy hh:mm:ss

                    Operating System Load Menu

        1 Continue immediately with operating system load
        2 Enter the Technical Maintenance Menu

        Loading will continue automatically unless you respond
        within 45 seconds.

        The default system pathname is :STARTER.SYS

        For assistance, press the Help key (SHIFT-F1) or H


        Enter choice [1]:
```
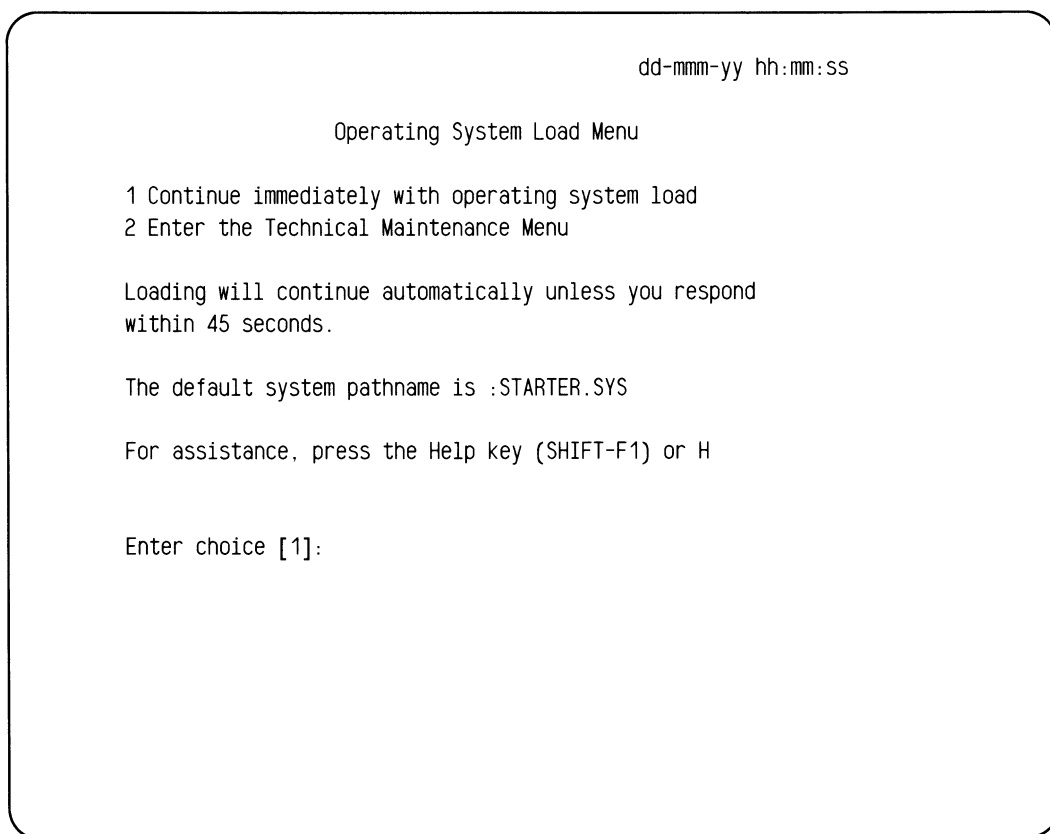
Figure 2-8. Operating System Load Menu

Note that if, for some reason, the Starter program was not on your disk, the words INSTALLED SYSTEM would appear as the default operating system instead of :STARTER.SYS. If this is the case, refer to the section "Errors at the Operating System Load and Technical Maintenance Menus" in Chapter 7.

In addition, note that the time-out interval might be a value other than 45 seconds for powerups after the first. You can change the time-out interval for this menu and the Starter Main Menu (discussed later in this chapter) by using the Technical Maintenance Menu. We describe the procedure in Chapter 5.

4. Decide what you want to do.

If you	The system will
Do nothing	Wait a preset number of seconds (initially 45); then continue the normal powerup sequence.
Press NEW LINE or type 1 and press NEW LINE	Immediately continue the normal powerup sequence.
Press SHIFT-F1 (Help) or H	Display a Help screen.
Type 2 and press NEW LINE	Interrupt the powerup sequence and display the Technical Maintenance Menu.

You will want to interrupt the powerup sequence at this point only if one or more of the following is true:

- You want to load and verify new microcode.

- You want to enter the SCP CLI.

- You want to change the time-out interval for the Operating System Load Menu and the Starter Main Menu to a value other than 45 seconds.

- You have purchased the Advanced Diagnostic Executive System (ADES) and you want to run diagnostic programs.

All of these options are described in the "Technical Maintenance Menu" section of Chapter 5.

For this description, we will assume once again that you choose to continue the normal powerup sequence.

5. Press NEW LINE, type 1 and press NEW LINE, or do nothing.

The system will continue to load the operating system code. The next screen you see will depend on whether or not you have ever set the system date and time.

If this is your first time powering up, and you did not interrupt the powerup sequence to set the date and time at the Change Preset Values Menu, you must do it now. You will receive the Change System Date or Time screen automatically. (Note that you will also receive this screen if you have changed your system's battery pack, which supplies power to the system clock. You will have to re-enter the date and time.) In step 6, we describe how to set the date and time.

If your system's date and time is set, your screen will display the Starter Main Menu. Skip to step 7.

6. Set the system date and time.

If your computer's internal clock needs to be set, your screen will display the Change the System Date or Time screen. This will usually be the case for first time powerup and when starting up after changing the system's battery pack. AOS/VS requires that a date and time be set before it will run. You can press Cancel/Exit at this screen, and Starter will still let you bring up AOS/VS, but AOS/VS will prompt you for a date and time before continuing. It is easiest to enter the date and time now.

Figure 2-9 shows the Change the System Date or Time screen. Note that the default values might appear for each entry.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│   STARTER Rev n.nn.nn.nn                        dd-mmm-yy hh:mm        │
│                                                                       │
│              Change the System Date or Time                           │
│                                                                       │
│     Enter the date and time in the formats shown below. Press         │
│     NEW LINE after each entry.                                        │
│                                                                       │
│     Enter current date (dd-mmm-yy or mm/dd/yy): dd-mmm-yy             │
│                                                                       │
│     Enter current time (hh:mm:ss, AM or PM optional): hh:mm:ss        │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│     To exit from any menu, press the Cancel/Exit key (F11).           │
│     For assistance at any time, press the Help key (SHIFT-F1).        │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 2-9. Change the System Date or Time Screen

Follow the instructions on the screen. There are two acceptable formats for the date. One is to use two digits for the day of the month, enough letters to define the month (that is, JUN for June, N for November), and two digits for the year. You can separate the day, month, and year by hyphens or spaces. The other acceptable format for the date is two digits for the month, two digits for the day, and two digits for the year, separated by either slashes or spaces. For example, if the date is April 24, 1987, you could specify it in any of these formats:

24-APR-87	24 AP 87	04/24/87	4 24 87
24-APRIL-87	24 apri 87	4/24/87	04 24 87

For the time, use numbers for hours, minutes, and seconds, based on a 24-hour clock, or specify AM or PM. (You can abbreviate AM and PM to A and P, either upper- or lowercase; don't use periods.)

For example, suppose it is exactly 2:45 p.m. You could fill in the time in any of these formats:

14:45:00	14 45	2:45:00 PM	2 45 p

You aren't required to enter minutes or seconds. Zeros will be assumed if you leave them blank.

Note that although you can specify the time as a.m. or p.m., it will always display on the screen in 24-hour format. Similarly, the date will always appear in European format, dd-mmm-yy.

If you make a mistake while typing the date or time, you can use the left and right arrow keys (→ and ←) to move backward and forward within the input field. You can also use the uparrow (Cursor Up) and downarrow (Cursor Down) keys to move from one input field to another. Likewise, you can use the Back Field function key (SHIFT-F11) to move back to the previous entry on the screen.

When you have entered a valid date and time, your powerup will continue, as described in step 7.

7. Your screen will display the Starter Main Menu, as shown in Figure 2-10.

```
STARTER  Rev n.nn.nn.nn                              dd-mmm-yy hh:mm

                        STARTER Main Menu

        1   Start the default operating system
        2   Start a different operating system
        3   Change the system date or time
        4   Make a physical backup of the disk (using PCOPY)
        5   Restore a disk from a physical backup (using PCOPY)
        6   Build or update the system disk




        The default operating system will start up automatically
        unless you respond within 45 seconds.

        Enter choice: 1




        To exit from any menu, press the Cancel/Exit key (F11).
        For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 2-10. Starter Main Menu

The default menu choice — that is, the one you are most likely to want at this point — will appear after the "Enter choice:" prompt. The default will usually be option 1, which will bring up AOS/VS. (We discuss the other menu options in the section "Starter Menu Options," later in this chapter. Refer to this section if the default choice is something other than 1. Note that if the default is not 1, then the message *The default operating system will start up automatically ...* will not appear.)

Note that the time-out interval might be a value other than 45 seconds, if you previously used the Technical Maintenance Menu to change the value for this menu and the Operating System Load Menu.

8. Type 1 and press NEW LINE or just press NEW LINE if 1 shows as the default.

You will receive the following message.

Please wait. The system is being loaded:
  DEFAULT.SYS

The default operating system (shown as DEFAULT.SYS) will start up and, after a minute or two, you will see your system's log-on banner. It will look something like the following:
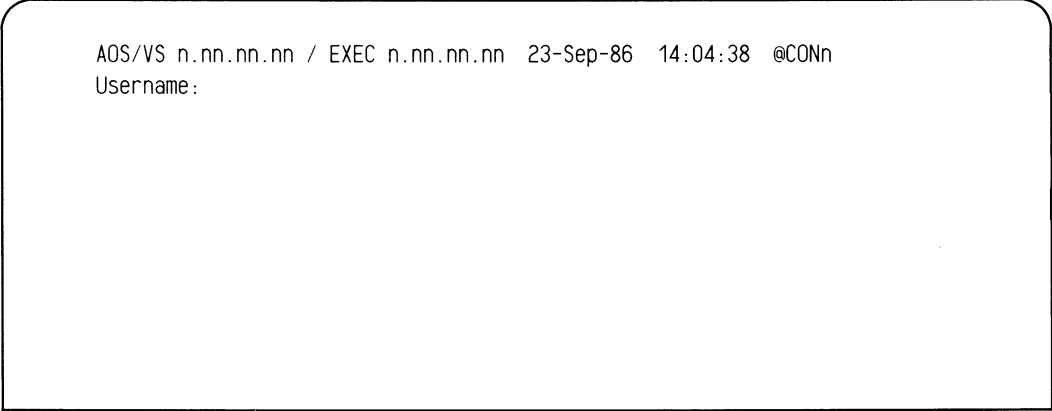
    *** *MODEL ID / Press NEW LINE to begin logging on* ****

where MODEL ID is MV/2000 DC, DS/7500, or DS/7700, depending on which system you have.

When you see the log-on banner, you know the system is up and running.

9. Press NEW LINE.

The system will prompt you for a username/password pair. The first screen will look like Figure 2-11.
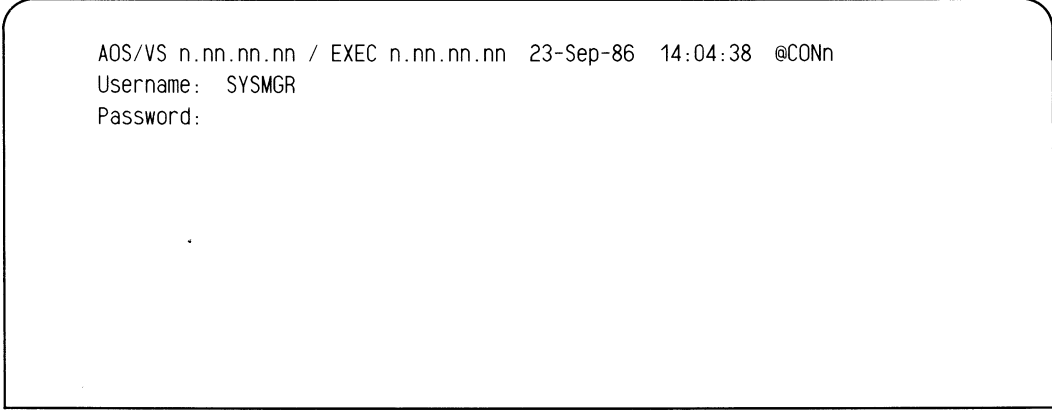
```
AOS/VS n.nn.nn.nn / EXEC n.nn.nn.nn  23-Sep-86  14:04:38  @CONn
Username:
```

Figure 2-11. Username Prompt

10. Enter the system management username, SYSMGR (either upper- or lowercase is fine), and press NEW LINE.

Next, the system will prompt you for a password, as shown in Figure 2-12.

```
AOS/VS n.nn.nn.nn / EXEC n.nn.nn.nn  23-Sep-86  14:04:38  @CONn
Username:  SYSMGR
Password:
```

Figure 2-12. Username and Password Prompts

If this is your first time bringing up the system, we recommend that you change the password right away, for security reasons. Skip to step 12. If this is not the first time up and you do not want to change the password, follow step 11, below, and skip steps 12 and 13.

11. Enter your password and press NEW LINE.

If you have entered the username/password pair correctly, you will come up in the program your profile specifies as your initial IPC file. If you haven't ever changed your initial IPC file, you will be running the SMI program, as you did the first time powering up. The system is now up and running. Skip the rest of this section and go on with your work. Refer to Chapter 3 for information on the SMI program.

12. Enter the supplied password, SYSTEM_MANAGER (note that the password does not echo on the screen). *Do not* press NEW LINE; instead, press the ERASE PAGE key or CTRL-L (press the CTRL key and hold it down while you press L).

If you have entered the System Manager username/password pair correctly, the system will prompt you to enter a new password.

13. Enter a new password and press NEW LINE.

Choose a password that you will be able to remember, but not one that other people would be likely to guess; for example, don't use your name. Note that your new password does echo on the screen so you can check to be sure you've typed it correctly. Your password must be from 6 to 15 characters long.

Be sure to select a password you can remember! If you forget your SYSMGR password, and you are the only system user with system management privileges, you will have to reload the SYSMGR profile from diskettes or tape to get the initial password back again.

The system will confirm that the new password is in effect. You will use this new password each subsequent time you log on (pressing NEW LINE instead of ERASE PAGE), until you change it again. (See Chapter 3, "Managing the System," for a more detailed discussion of system security.)

If you have typed in the System Manager username/password pair correctly, you will then see the System Management Interface (SMI) Main Menu on your screen. We discuss this menu and system management functions in Chapter 3.

Congratulations! The system is up and running and you are logged on as its system manager.

Note that if this is your first time powering up the system, you should immediately use SMI to specify your system's configuration. Doing so will help the system make system management easier for you. Select option "4 Run administrative functions" on the SMI Main Menu; then option "3 Customize the system" on the Administrative Functions Menu. "Specify system configuration" is the first option on the Customize the System Menu. We describe this option, and all of the other SMI menus and options, in the next chapter, "Managing the System."

Starter Menu Options

At the Starter Main Menu, you have several options besides those covered in the "Bringing Up AOS/VS" section of this chapter. In this section, we'll briefly describe the Starter program (also referred to as Starter), and describe all of its menu choices and when you would want to select them.

The Starter Program

Starter is a *stand-alone* program that comes with AOS/VS on MV/2000 DC and DS/7000-series systems. Stand-alone refers to a program that runs only when the operating system is not running; it must run alone.

Starter is a disk initialization and bootstrap program. *Initializing*, in this context, means building the disk; that is, software formatting the disk and loading software onto it. The disk must be initialized before you can use AOS/VS. *Bootstrapping* means loading a large program from disk into the computer's memory. Therefore, Starter prepares the disk for AOS/VS files, loads the files onto the disk, and then loads AOS/VS from the disk into the computer's memory. AOS/VS must be in memory for you to use it.

Starter is the program that will run on powerup before AOS/VS is running. Once AOS/VS starts running, Starter is no longer running but something else is, for example the System Management Interface (SMI) program, or CEO, or the CLI.

Starter is both menu driven and command driven, meaning you can select its options either by selecting menu choices or by specifying command keywords. We described how to use the command and menu keywords in Chapter 1. A tear-out card at the end of this manual lists all of the keywords for both Starter and the SMI program. This card is duplicated in Appendix B.

In this section, we specify the keyword appropriate for each option in parentheses after the heading for the option; for example, one of the next headings you see will be "Starting Up AOS/VS (BOOTSTRAP)." This means you could select this option from anywhere within the Starter menu series by typing BOOTSTRAP and pressing NEW LINE.

The Starter Main Menu is pictured in Figure 2-13.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│   STARTER Rev n.nn.nn.nn                         dd-mmm-yy hh:mm       │
│                                                                       │
│                         STARTER Main Menu                             │
│                                                                       │
│        1   Start the default operating system                         │
│        2   Start a different program or operating system              │
│        3   Change the system date or time                             │
│        4   Make a physical backup of the disk (using PCOPY)           │
│        5   Restore the disk from a physical backup (using PCOPY)       │
│        6   Build or update the system disk                            │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│        Enter choice:                                                  │
│                                                                       │
│                                                                       │
│                                                                       │
│        To exit from any menu, press the Cancel/Exit key (F11).        │
│        For assistance at any time, press the Help key (SHIFT-F1).     │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 2-13. Starter Main Menu

While running Starter, you can get to the Starter Main Menu at any time by issuing the
MAIN keyword.

Device Names and Device Codes

With some of the Starter options, you will be prompted to enter a *device name* (or "unit
name"). The device name is a series of characters that the system uses to identify the
device, such as a disk or tape unit. Your peripherals directory (:PER) contains an entry
for each device. Each device name begins with a commercial at sign (@), which is an
abbreviation for the :PER directory. Therefore, the device name @DPJ0 refers to the
device noted in the peripherals directory named :PER:DPJ0.

When you enter a device name, you can specify it with or without the @ sign. The Starter
program will fill in the missing @ sign if you don't include it. In addition, if you specify
the pathname of the device, such as :PER:MTJ0, Starter will shorten it to the device name
with the @ sign (@MTJ0 in this example). Finally, if you have created any links to
device names in the :PER directory, Starter will resolve the links. (For information on
how to create links, see the *Command Line Interpreter (CLI) User's Manual (AOS and
AOS/VS).*)

Table 2-2 lists the device names and device codes for each device you might need to
specify. Note that you won't need to use the device code for anything, but you might see
one in an error code, such as *SOFT ERROR, DEVICE 23*. This table will help you
identify which device is causing any such error.

Table 2-2. Device Names and Device Codes

Device	Device Name	Device Code
System Disk Unit	@DPJ0	24
Additional Disk Unit	@DPJ1	24
Diskette Drive	@DPJ10	64
Model 6351 Tape Drive	@MTJ0	23
Model 6352 or 6341 Tape Drive	@MTJ10	63
Additional Model 6352 or 6341 Tape Drive	@MTJ11	63

Starting Up AOS/VS (BOOTSTRAP)

Option "1 Start the default operating system" on the Starter Main Menu instructs the system to start up AOS/VS. Until AOS/VS is running, no users can log on to the system. Unless there is something wrong with your disk, option 1 will probably show up as the default on the Starter Main Menu; that is, there will be a 1 after the "Enter choice:" prompt. If so, all you have to do to select it is press NEW LINE.

If anything other than 1 shows up as the default, it means there is something else you should do before starting up AOS/VS. If this is the case, refer to the appropriate section of this portion of the chapter, to see what the specified option does.

When you select option 1, the system will bring up AOS/VS and after a few minutes you will receive the log-on banner on your screen, as we described earlier during the powerup sequence.

Entering the keyword BOOTSTRAP from anywhere in the Starter menu series also starts up AOS/VS, as long as your disk has the necessary system files on it.

Starting Up a Different Program or Operating System (SYSTEM)

Option "2 Start a different program or operating system" on the Starter Main Menu allows you to bring up a system other than AOS/VS if you have one on your disk. It also enables you to run any stand-alone program you have, including FIXUP, Disk Formatter (DFMTR), and other utilities. (A stand-alone program is one that can run only when the operating system is not running.) If you want to do this, first refer to the documentation that came with your other system or stand-alone program, and be sure you have it loaded correctly. You will also have to know the AOS/VS pathname to the system or program, because Starter will prompt you for it once you select option 2.

The keyword for this option is SYSTEM.

Changing the System Date and Time (DATE)

You are required to set the system date and time when you first bring up your MV/2000 DC or DS/7000-series system; we described this in the powerup section of this chapter. However, there might be other instances in which you will have to change the date or time. For example, if you live in a region that observes Daylight Savings Time, you will have to change the time twice a year. You will also have to reset the date and time whenever you change your computer's battery pack, which powers the clock and calendar.

To change the system date or time, type 3 and press NEW LINE from the Starter Main Menu. From any Starter menu, you can specify the keyword DATE to use this option.

The system will prompt you first to enter the date, using the format dd-mmm-yy or mm/dd/yy, and then the time, using the format hh:mm:ss. If you don't specify AM or PM, a 24-hour clock will be assumed. For example, if the date is June 9, 1987 and the time is 5:15 p.m., you might respond to the prompts as follows:

Enter the current date (dd-mmm-yy or mm/dd/yy): 09-JUN-87)
Enter the current time (hh:mm:ss, AM or PM optional): 17:15:00)

Alternatively, you might specify the following:

Enter the current date (dd-mmm-yy or mm/dd/yy): 6/9/87)
Enter the current time (hh:mm:ss, AM or PM optional): 5:15 pm)

Note that if you do specify AM or PM, you can use the abbreviations A and P, and use either upper- or lowercase; but don't type any periods (for example, type PM or pm, but not P.M. or p.m.).

When you have entered a valid date and time, Starter will redisplay the Starter Main Menu (or whatever screen you were at if you issued the DATE keyword). The date and time you entered will appear on the status (top) line of each Starter screen. Note, however, that the time will be updated on the screen only when the screen is refreshed; that is, when a new menu or command screen appears, or when you press the ERASE PAGE key. If you leave your terminal with a Starter screen displaying and don't come back for several minutes (or even hours), the displayed time will be the same as it was when you left. Press ERASE PAGE for an update.

Making a Physical Backup Copy of the Disk Using PCOPY (BACKUP)

Option "4 Make a physical backup of the disk (using PCOPY)" on the Starter Main Menu allows you to make a physical backup copy of a hard disk. You can also use the keyword BACKUP from anywhere in the Starter menu series to select this option. A *physical backup* copies each used sector on the disk, in order. That is, a physical backup copies files on the disk in the order in which they are stored on the disk; whereas a *logical backup* copies files by user (that is, User A's files are all copied; then User B's files, etc.). We describe logical backup in Chapter 4.

When you select option 4 to perform a physical backup, the system calls a utility named PCOPY, which will perform the disk copy. You can make your backup on either diskettes or tape, as long as you have the appropriate device available.

When you select option 4, a screen will appear and prompt you to specify if you will be copying the disk to tape or diskette. The screen also prompts for the disk unit name. The prompts and their default responses appear below.

Enter T (Tape), D (Diskette), or a unit name: T

Enter the disk unit name: @DPJ0

At the first prompt, type T for tape or D for diskette. Alternatively, you can enter the device name; that is, @DPJ10 for diskette and @MTJ0 or @MTJ10 for tape. If you have only one disk unit, just press NEW LINE at the second prompt. If you have two, your second disk unit will be @DPJ1. Type in the appropriate unit name and press NEW LINE.

When you have entered a valid media type and disk unit name, Starter places you in the PCOPY utility program. See *How to Generate and Run AOS/VS* for information on PCOPY. Note that one of the PCOPY prompts, when you use diskettes, says to mount

the next diskette and *Press any key when ready.* This prompt refers to the alphanumeric and punctuation keys, and not those such as DEL, and not key sequences such as CTRL sequences. For simplicity, we suggest that you press NEW LINE or the space bar if you receive such a prompt.

| When PCOPY finishes the backup, you can press NEW LINE to return to the Starter Main Menu.

Restoring a Physical Copy of a Disk Using PCOPY (RESTORE)

If you have made a physical copy of a hard disk using option 4 on the Starter Main Menu (described above) you can restore the disk from the copy using option "5 Restore the disk from a physical backup (using PCOPY)," or by issuing the RESTORE keyword. When you select option 5, you will see the Restore a Physical Copy of a Disk screen. This screen prompts you for the type of media you are restoring from and the disk unit name, as follows.

Enter T (Tape), D (Diskette), or a unit name: T

Enter the disk unit name: @DPJ0

At the first prompt, enter T for tape, D for diskette, or the device name (for example, @MTJ0 or @MTJ10 for tape). At the second prompt, press NEW LINE to accept the default (@DPJ0) if you have only one disk, or if you are restoring your first disk unit. Type @DPJ1 for the second disk unit and press NEW LINE. If your disk has not yet been software formatted, you will then see the following message at the bottom of your screen:

Please wait while the disk is being software formatted, @DPJn

where *n* is 0 or 1, depending on which disk unit you specified.

When the disk is software formatted, Starter passes control to the PCOPY utility. Refer to *How to Generate and Run AOS/VS* for information on PCOPY. When PCOPY is | finished, you can press NEW LINE to return to the Starter Main Menu.

Building or Updating the System Disk (SYSDISK)

Option "6 Build or update the system disk" on the Starter Main Menu allows you to update system information on your hard disk or to build a new system disk. When you select this option, the Build or Update System Disk Menu will appear on your screen, as shown in Figure 2-14. You can also get to this menu by using the SYSDISK keyword.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│   STARTER  Rev nn.nn.nn.nn                      dd-mmm-yy hh:mm        │
│                                                                       │
│                  Build or Update System Disk Menu                     │
│                                                                       │
│       1  Build the system disk                                        │
│       2  Format a disk                                                │
│       3  Load new system software on the disk                         │
│       4  Load the default operator profile on the disk                │
│       5  Load new system firmware on the disk                         │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│       Enter choice:                                                   │
│                                                                       │
│                                                                       │
│                                                                       │
│       To exit from any menu, press the Cancel/Exit key (F11).         │
│       For assistance at any time, press the Help key (SHIFT-F1).      │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 2-14. Build or Update System Disk Menu

To return to the Starter Main Menu from the Build or Update System Disk Menu, press the Cancel/Exit key, F11.

Building the Disk (BUILD)

Option "1 Build the system disk" on the Build or Update System Disk Menu allows you to rebuild your system on a new hard disk if your former system disk is damaged. If this is the case, you will discover it in any number of ways. Usually, you will receive error messages on attempting to start up the operating system, or the Starter program will replace some of the option numbers on the Starter Main Menu with asterisks.

The keyword for this option is BUILD.

Because building the disk is a fairly involved process, we have described it separately, in Appendix A, "Reinstalling the Operating System If the Disk Is Damaged." If option 1 on the Starter Main Menu has an asterisk where the number 1 should be, refer to Chapter 7, "What If Something Goes Wrong?". Chapter 7 will refer you to Appendix A if it is appropriate for your situation.

Formatting a Disk (FORMAT)

Option "2 Format the disk" on the Build or Update System Disk Menu allows you to software format a disk. You needn't select this option when you are rebuilding a disk (option "1 Build the system disk"), because software formatting is done when you select

option 1. However, if you buy an additional disk unit, you will have to software format the second disk before you can use it. (See the section "Two-Disk Systems," later in this chapter.)

When you select option 2, the Format a Disk screen will appear, which prompts you for a disk unit name, as follows:

Enter the disk unit name: @DPJ0

To accept the default, @DPJ0, press NEW LINE. To specify your second disk unit, if you have one, type @DPJ1 and press NEW LINE. To specify the diskette drive, enter @DPJ10. The following message will appear at the bottom of your screen.

Please wait while the disk is being software formatted, @DPJn

where *n* is 0, 1, or 10. When the disk has been software formatted, you will return to the Build or Update System Disk menu.

NOTE: Formatting a disk is a lengthy procedure. It will probably take about 2 minutes per megabyte; that is, over 2 hours for a 70-Mbyte disk and about 4 hours for a 120-Mbyte disk.

Loading New System Software on the Disk (SOFTWARE)

Option "3 Load new system software on the disk" on the Build or Update System Disk Menu lets you load AOS/VS system software on your disk. You might need to do this for the following reasons:

• You have received a new revision of the software and want to upgrade.

• On startup, the Starter Main Menu might have replaced option numbers 1 and 2, or just 1, with asterisks. This indicates that the Starter program could not locate one or more essential AOS/VS-related files.

If either of these situations arises, select option "3 Load new system software on the disk" on the Starter Main Menu, or specify the SOFTWARE keyword from anywhere in the Starter menu series. The Starter program will attempt to determine what type of media you will use. If Starter has been loaded from tape or diskette, it will assume that you will be loading the new software from the same media. But if Starter has been loaded from the disk, as is usually the case, it won't be able to tell whether you are going to use tape or diskette, so it will prompt you as follows:

Enter T (Tape), D (Diskette), or a unit name: T

Type T for tape, D for diskette, or the unit name (for example, @MTJ0 or @MTJ10 for tape), and press NEW LINE. Starter will then prompt you to mount the appropriate tape or diskette. For example, for model 6351 tape, it will prompt

Mount the tape labeled OS SYSTEM MEDIA on unit @MTJ0
Press NEW LINE when ready.

(If you are using diskettes, two separate programs will prompt you to insert the appropriate diskette.) After you mount the tape or diskette, press NEW LINE. Starter will display some messages as it loads software from the media, but you don't respond to them. When it is finished, Starter will return you to the Build or Update System Disk Menu.

Loading the Default Operator Profile on the Disk (PROFILE)

AOS/VS comes with a system manager profile, called SYSMGR. This is the profile you use when you bring the system up, and you might use it all the time as your normal user profile. As you might recall from the powerup portion of this chapter, we instructed you to change the password for the SYSMGR profile as soon as you logged on for the first time. We also recommend that you change this password every so often in order to keep the profile secure.

Doing so, however, can mean that you might forget the SYSMGR password. If this happens, and there is no other system user with the necessary privileges to give you a new password, you can reload the profile via option "4 Load the default operator profile on the disk" on the Build or Update System Disk Menu. You will then be able to log on using the supplied password, SYSTEM_MANAGER. When you reload the profile, the original SYSMGR profile will be renamed SYSMGR.BU in the :UPD directory.

When you select option "4 Load the default operator profile on the disk" or specify the PROFILE keyword, a screen will appear and prompt you to enter what type of media you are loading the profile from. Enter T for tape, D for diskette, or enter the unit name (for example, @MTJ0 for tape). Starter will then prompt you to mount the tape or diskette so it can load the profile.

Find the OS SYSTEM MEDIA tape or the first OS UTILITIES MEDIA diskette and mount or insert it. Press NEW LINE when the tape or diskette is ready. Starter will display a message as it loads the profile. When it is finished, Starter will return you to the Build or Update System Disk Menu. You can then continue the powerup and log on as SYSMGR using the supplied password. *Don't forget to change the password immediately.* And try to make the new password something easy to remember.

Loading New System Firmware on the Disk (FIRMWARE)

Option "5 Load new system firmware" on the Build or Update System Disk Menu allows you to load a new revision of the system's microcode. The keyword for this option is FIRMWARE. This menu option, however, does not apply to MV/2000 DC and DS/7000-series systems. The number 5 will be replaced with an asterisk on the Build or Update System Disk Menu for these systems.

Two-Disk Systems

If you have two disks on your system, you will need to perform a few functions that aren't necessary on one-disk systems. Be sure to do the following:

1. On your first time powerup, format the second disk at the Starter program's Build or Update System Disk Menu.

    Select option "6 Build or update system disk" at the Starter Main Menu to get to the Build or Update System Disk Menu; then select option "2 Format a disk." Or just use the FORMAT keyword.

    When prompted, specify the disk unit name as @DPJ1, as follows:

    Enter the disk unit name: @DPJ1)

    You will then see the following message:

    Please wait while the disk is being software formatted, @DPJ1

Formatting a disk is a lengthy procedure. It will probably take about 2 minutes per megabyte; that is, over 2 hours for a 70-Mbyte disk and about 4 hours for a 120-Mbyte disk.

2. Edit the UP macro so that the system will *initialize* the second disk unit whenever it comes up.

   The SMI program's Customize the System Menu has an option for editing the UP macro. To get to this menu, select option "4 Run administrative functions" from the SMI Main Menu, and then option "3 Customize the system" from the Administrative Functions Menu.

   Choose option "5 Edit the UP macro" on the Customize the System Menu. (Alternatively, you can specify the UPCLI keyword from any SMI menu to get to this option immediately.) You will use the SED text editor to edit the UP macro, so have your SED documentation handy. (See Chapter 3 for details on editing the UP macro.)

   Find the line in the UP macro that says the following:

   > Comment   Initialize second disk

   The line directly following this line should look like this:

   > [!EQUAL 1,2]

   This line makes the following several lines of the macro unexecutable. Since these lines are necessary if you have two disks, you must change the [!EQUAL] statement to make the following lines executable. To do so, just change the 2 to 1. The line will then look like this:

   > [!EQUAL 1,1]

3. Note the names that the Starter program gives your disks.

   Starter names your first disk DPJ0_LDU. This is the *system disk*. It contains your :UDD, :UTIL, :PER, :QUEUE, and other system directories. When you refer to any files on this disk with pathnames, the pathname starts with : (the root).

   Your second disk is named DPJ1_LDU by Starter. The system will treat this disk like a directory in the root. In other words, to refer to a file on this disk, you must include DPJ1_LDU in its pathname. For example, suppose you have the directory PRODUCTS on your second disk. To refer to the file WIDGEN in the PRODUCTS directory, you would specify the following:

   > :DPJ1_LDU:PRODUCTS:WIDGEN

4. The UP macro causes the FIXUP program to create a log file called :FIXUP.LOG whenever FIXUP runs on the two disks. Keep an eye on this file as it might become large. Delete it when necessary to regain the disk space.

End of Chapter

Chapter 3
Managing the System

The first part of this chapter is for the

System Manager   ☑

System User   ☑

Managing the system is an important task, but with the help of the menus supplied with AOS/VS, you will find most functions easy to perform.

What Does the System Manager Do?

The person acting as system manager is responsible for a number of tasks, including

• Starting up and shutting down the system.

• Setting the system date and time.

• Determining what will happen each time the system comes up.

• Creating and modifying user profiles.

• Managing terminal users.

• Managing the devices, such as the disk and printer.

• Backing up the system and restoring it in the event of a system failure.

• Controlling the batch queue.

• Managing the network.

• Installing new software and software updates.

Many of these functions you can perform by selecting them from the System Management Interface (SMI) program's menu series. The system will then instruct you on the screen as to what you must do.

The rest of this chapter explains what you should know about system security, and how to use the above-mentioned menus to perform system management functions. More difficult and less-often-used system management functions, such as monitoring your disk space, are covered in Chapter 5, "Advanced Functions."

System Security

Because computers contain important and often valuable information, it is vital that you have adequate security for your system. Not only must the information stored within the computer be secure from unqualified persons, but tapes and diskettes must also be stored securely, and the system console should be located in an area accessible only to those who need it.

This section describes how to maintain security in all of these areas. If you are at an installation where even greater security is imperative, and you are using DG/VIEW on *pixel-mapped* (graphics) terminals, you might want to run AOS/VS without the SMI program. Refer to *How to Generate and Run AOS/VS* for more information.

Physical Security

In any computer installation, anyone who can touch the actual computer or its disk unit(s) can bring the system down. If your installation requires strict security, it is essential that you keep the computer and preferably the system console in a secure location. It should be in a room that is locked when the system manager or operator is away, and the system console should not be left in a program to which access should be restricted (as discussed later in this chapter) when the system manager is not around.

Similarly, it is important to keep vital tapes or diskettes, such as system backups, locked up where no one can take or damage them. If users need any files restored from system backup, they can ask the system operator or manager, or other person designated as archive manager, for the appropriate tape or diskette(s).

The physical security of your installation also depends on the environmental conditions. Be sure to keep the computer area clean, uncluttered and free of dirt and dust. It is also essential to keep the temperature within the range 32 to 100 degrees Fahrenheit (0 to 38 Celsius). If the computer gets too hot or too cold, it can go down, and information on your disk could be lost. Ideally, the computer should remain in temperatures between 55 and 85 degrees Fahrenheit.

User Profiles

On a multiuser system, it is important to have a secure system. There are many functions that the system manager alone should be able to perform. The system manager assigns *profiles* to restrict users from features they don't need, but to ensure that they have the ability to perform tasks they do need. Each user profile has a username/password pair; no one can use the profile without knowing the password. This helps maintain system security.

Each user's profile tells which system resources are available to that user and which *privileges* the user does and doesn't have. For example, three privileges that users can have are System Manager, Superuser, and Superprocess. AOS/VS comes with two types of "ready-made profiles" that you can assign: the System Manager profile and the System User profile. Each of these profiles assigns the user 25000 *disk blocks* for files. (Disk blocks are sections of space on the disk for storing information.)

NOTE: Be careful not to confuse the System Manager privilege with the System Manager profile. The System Manager privilege is one of many settings in a user profile. The System Manager profile is an entire user profile that has as one of its settings the System Manager privilege.

Users with the System Manager profile have the Superuser, Superprocess, and System Manager privileges. The System Manager profile allows users to perform administrative

tasks such as managing the batch queue, terminating processes, starting up and shutting down the system, and creating or modifying user profiles. That is, the profile permits access to the restricted administrative functions that branch off the System Management Interface (SMI) Main Menu, described later in this chapter.

You should limit the number of users to whom you give the System Manager profile. In fact, you might find that you alone need the System Manager profile.

The System User profile is for other system users who don't need the privileges of system management. Assign this type of profile to the majority of your system users.

The section "Managing User Profiles," later in this chapter, explains how to assign profiles to system users with the easy-to-use menu system.

You can create different profiles from the two ready-made ones that come with AOS/VS. For example, you might want to give user Robin the ability to perform most system management functions, which the System Manager privilege allows, but you don't want to allow Robin to terminate user processes or manage user profiles, which require the Superprocess and Superuser privileges, respectively. So you would want to give Robin the System Manager privilege, but not the ready-made System Manager profile.

Or you might want to give some users more disk space than 25000 blocks. If you are interested in creating profiles other than the two ready-made profiles we supply, you will have to run the PREDITOR profile editor. Refer to the section "Running a Program or Application," later in this chapter, for information on how to start up PREDITOR from the SMI program. Once PREDITOR is running, use the following procedure:

Enter e (for "edit") at the "Command:" prompt, enter the appropriate username at the "Username:" prompt, and then just press the NEW LINE key repeatedly until the prompt you need appears. The Superuser, Superprocess, and System Manager privilege prompts all appear close together in the PREDITOR dialog. The prompt for disk space comes later. Answer any prompts for information you want to change, and press NEW LINE for all other prompts. Exit PREDITOR by typing BYE and pressing NEW LINE.

For additional information, see the chapter on PREDITOR in the *How to Generate and Run AOS/VS* manual.

EXEC and the Multiuser Environment

When you bring up AOS/VS, the multiuser environment is already in place. A program called EXEC, located in the AOS/VS directory :UTIL, supervises the multiuser environment. EXEC performs several functions, including
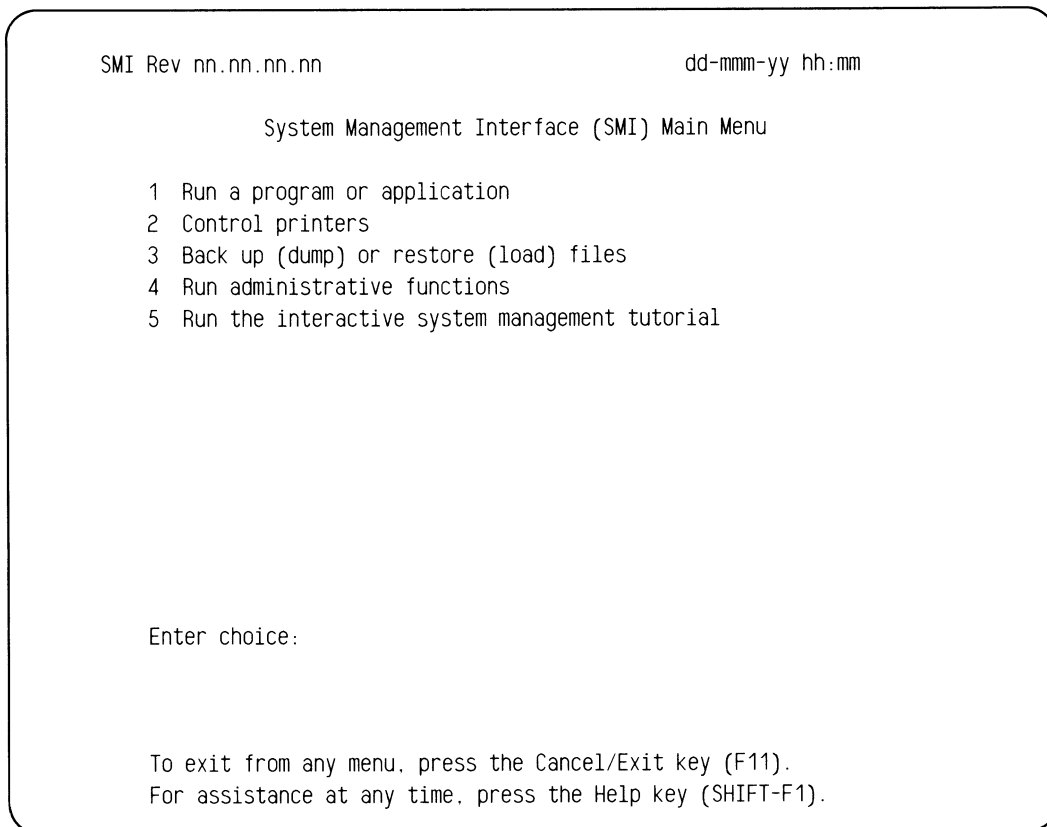
- Logging users on and off — When a user attempts to log on, EXEC checks for a valid profile. If the username/password pair entered matches a profile, EXEC creates a user process with the values stored in that user's profile. When the user logs off, EXEC terminates the user process.

- Managing printer and batch queues — EXEC maintains a batch input, list, and batch output file for each batch request, and it sends print requests to the appropriate printer. It manages the queues with very little user intervention.

The system manager uses a series of EXEC commands to perform various system management functions. You can perform many of these commands via the SMI program. Rather than entering an EXEC command from the CLI, you can select it as an option on a menu. The next section describes the SMI program in more detail.

Note that the SMI program does not contain *every* EXEC command; rather, it includes those most often used. Refer to *How to Generate and Run AOS/VS* for a complete list of EXEC commands, and a detailed description of the EXEC program.

The SMI Program

The SMI program is an easy-to-use, menu-driven program that allows you to perform various EXEC commands and a few CLI commands. Some of SMI's system management functions, such as controlling the printers and backing up or restoring personal files, are available to all users on the system. Other functions are restricted to users who have the System Manager privilege in their user profiles (as users with the System Manager profile do). The SMI Main Menu is pictured in Figure 3-1.

```
SMI Rev nn.nn.nn.nn                                    dd-mmm-yy hh:mm


                  System Management Interface (SMI) Main Menu

          1  Run a program or application
          2  Control printers
          3  Back up (dump) or restore (load) files
          4  Run administrative functions
          5  Run the interactive system management tutorial













          Enter choice:




          To exit from any menu, press the Cancel/Exit key (F11).
          For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-1. SMI Main Menu

Note that, like the Starter menus, the SMI menus all display a status line at the top of the screen, which notes the program name and revision number and the current date and time. The time, again like that of the Starter menus, will be updated only when the screen is refreshed. Therefore, when a new menu or command screen displays, or when you press the ERASE PAGE key, the time will be updated; but if you leave your terminal while an SMI screen is displaying, and don't return for many minutes or hours, the time displaying when you return will be the same as when you left.

Although any system user can execute the SMI program, not all users will see exactly the same SMI Main Menu. Only those users having the System Manager privilege in their profiles will have options 4 and 5; regular system users will see just the first three options.

Getting to the SMI Main Menu

There are several ways to get to the SMI Main Menu. If your initial program file (set in the profile) is SMI.PR, you will automatically receive the SMI Main Menu when you log on. (Note that SMI.PR is SYSMGR's initial program file on first time startup. You can change the SYSMGR profile, however, to make a different program come up on logon. We describe how to modify profiles later in this chapter.)

Any system user can get to the SMI Main Menu by executing the SMI program, either from the CLI or from CEO. To execute SMI from the CLI, you have two choices. You can use the SMI.CLI macro, as follows:

) SMI ⏎

Or you can enter the following command:

) XEQ SMI ⏎

All users that have the System Manager privilege in their profiles must be in their own user directories when issuing the above command, in order to be able to perform the restricted access functions available through SMI. The SMI.CLI macro automatically places you in your own user directory, so it doesn't matter what your working directory is if you execute SMI via the macro.

Any CEO user can enter SMI, as long as the CEO manager has added SMI as a public user application. To run the SMI user application from CEO, select the "User applications" option from either the Utility Functions Menu or the Interrupt Menu (press the Interrupt function key, F5). Then specify that you want to work with public applications, and then specify the option number for the SMI application. Refer to your CEO documentation for more detailed instructions on running user applications.

When you have executed SMI, the SMI Main Menu will appear on your screen.

Pressing Cancel/Exit (F11) from the SMI Main Menu will return you to wherever you were when you executed SMI. If you went into SMI directly on logging on (that is, if SMI is your initial program), you will be logged off. In any event, you will first receive a screen informing you that this will happen, giving you the option to remain in SMI.

While running SMI, you can get to the SMI Main Menu from anywhere else in the SMI menu series by issuing the keyword MAIN. In the rest of this chapter, we have indicated the keyword for each menu or command in uppercase letters, parenthesized, after the heading describing the option. For example, the next section is "Exiting from the SMI (BYE)." To select this option from anywhere within SMI, just type BYE and press NEW LINE.

Exiting from the SMI (BYE)

To exit from the SMI program, press the Cancel/Exit key (F11) from the SMI Main Menu, then answer Y (yes) to the question that asks if you really want to exit from SMI. Alternatively, you can type the keyword BYE from any SMI menu, and you will exit SMI immediately. If you entered the SMI from the CLI, or from CEO, or some other program, you will return to that program. If you entered the SMI at logon, you will be logged off.

Entering the CLI (CLI)

The SMI program has a keyword that allows you to enter the CLI at any time, while still running SMI. If you enter the keyword CLI at any menu, you will then see a special CLI prompt, as follows:

Enter choice: CLI)

SMI_CLI)

This SMI_CLI) prompt, like the CEO CLI) prompt that you get if you enter the CLI from CEO, shows you that you are running the CLI on top of another program. It reminds you that you are still running the SMI and that if you enter BYE at this prompt, you will return to the SMI.

You can also enter the CLI via option "1 Run a program or application" on the SMI Main Menu, as described next.

Running a Program or Application (PROGRAM)

Option "1 Run a program or application" on the SMI Main Menu allows you to run any application or program that you have access to. When you select option 1, or use the PROGRAM keyword from anywhere within SMI, the system will prompt you to enter a CLI command line or a macro, which will tell the system what you want to run. If you want to enter the CLI, just press NEW LINE at the prompt, or type CLI and press NEW LINE. Otherwise, type the command line or macro name and press NEW LINE.

For example, suppose you wanted to run the PREDITOR profile editor, to give a user more disk space than the 25,000 blocks initially allocated. You would respond to the prompt in the following way:

Enter a CLI command line or a macro name, or press NEW LINE to
enter the CLI:
XEQ PREDITOR)

If the command you enter is one that takes arguments, you can type them on the same line. For example, suppose user Sandy wanted to use the SED text editor to edit a disk file in the directory :UDD:SANDY called MINUTES_10.04.86. Sandy could type the following:

XEQ SED :UDD:SANDY:MINUTES_10.04.86)

where :UDD:SANDY:MINUTES_10.04.86 is the pathname to the file to edit. Both SED and :UDD:SANDY:MINUTES_10.04.86 are arguments to the command XEQ. Note that you need not specify a file's entire pathname if the file you specify is in a directory in your search list.

SMI will clear the screen and start up the program you specify. When you are finished running the program or application, SMI will display the program's termination message. It will then prompt you to press NEW LINE to continue with SMI and you will return to the SMI Main Menu.

Note that CLI is also an SMI keyword. You can enter the keyword CLI from anywhere in the SMI menu series and immediately enter the CLI.

Controlling the Printers (PRINTERS)

Option "2 Control printers" on the SMI Main Menu lets any user issue a subset of printer commands. The keyword for this menu is PRINTERS. Before using these commands, you should be familiar with how printers and print queues work under AOS/VS. Be sure you understand the differences between the following items before you continue:

printer
: The physical printing device. The machine from which your printout emerges.

print queue
: A file that holds print requests until the printer and system are ready to process them. A queue can send requests to one printer, or to many printers. Similarly, a printer can accept print requests from one or many queues. It is up to the system manager to determine which queues will be associated with which printers.

print request
: The file or document that you have sent to a queue to be printed. You can queue print requests from the CLI, from CEO, from the Control Printers Menu, or from an application program.

print job
: Same as print request.

sequence number
: A number that the system assigns to each print request. When you display the contents of print queues, the list shows the sequence numbers. To cancel a request in a print queue, you must know its sequence number.

If you have any questions as to the names of your printers and print queues, or which queues are associated with which printers, see your system manager.

When you select option "2 Control printers" on the SMI Main Menu, the Control Printers Menu will appear on your screen, as shown in Figure 3-2.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│   SMI Rev nn.nn.nn.nn                         dd-mmm-yy hh:mm          │
│                                                                       │
│                        Control Printers Menu                          │
│                                                                       │
│            1  Print files                                             │
│            2  Display contents of print queues                        │
│            3  Cancel requests in print queues                         │
│            4  Align printer paper                                     │
│            5  Pause a printer                                         │
│            6  Continue a printer                                      │
│            7  Clear a printer                                         │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│            Enter choice:                                              │
│                                                                       │
│                                                                       │
│                                                                       │
│            To exit this menu, press the Cancel/Exit key (F11).        │
│            For assistance at any time, press the Help key (SHIFT-F1). │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 3-2. Control Printers Menu

More advanced printer functions are available to users with the System Manager privilege in their profiles via the Manage Printers and Print Queues Menu, described later in this chapter.

To exit from the Control Printers Menu at any time, press the Cancel/Exit key, F11. You will return to the SMI Main Menu.

Printing Files (QPRINT)

You can send files to a queue to await printing by selecting option "1 Print files" on the Control Printers Menu or by specifying the QPRINT keyword. When you select this option, the system will prompt you to enter the queue you want the file(s) placed in, the printer form to use, and the pathname of each file you want printed. After you enter the information, you will return to the Control Printers Menu. As long as you entered legal filenames, your files will print, and you can pick up the output at the printer when they finish. (Note that this option works only for files stored in the AOS/VS file system. To print CEO documents, you must do so from CEO.)

Be sure to specify a queue that has been created and is open. If the queue has never been created or has been deleted, you will receive a *Queue does not exist* error message. If the queue exists, but is not a print queue, you will receive the message *Queue is not a print queue.* If the print queue exists, but is closed, you will see the message *Queue is not open.*

If you have the System Manager privilege in your profile, you can open the queue if it exists, or create it if you need to, via the Manage Printers and Print Queues Menu

(described later in this chapter). If you do not have the System Manager privilege, see your system manager.

For example, suppose user Robin has the file REPORT and a directory called LETTERS in the user directory :UDD:ROBIN. Robin wants to print REPORT and a file in the LETTERS directory called EVANS on the letter-quality printer, using the default form. The queue associated with this printer is LQP1. To print these files from the Control Printers Menu, Robin selects option "1 Print files," as follows:

Enter choice: 1 ⌡

The Print Files screen appears, and Robin answers the prompts as follows:

Pathname(s): :udd:robin:report :udd:robin:letters:evans ⌡

Queue name: LQP1 ⌡

Form name: DEFAULT ⌡

The files enter the LQP queue and await printing. The Control Printers Menu reappears on Robin's screen.

If you specify a form name other than the default, you'll have to use the "Switch to special form" option on the Control Printer Forms Menu to change the printer form. Note that this menu is restricted to users with the System Manager privilege in their profiles, so if you don't have this privilege, you will have to accept the default form, or ask your system manager to switch the forms for you.

Note that if you use the QPRINT keyword to print any files, instead of selecting the menu option, you will be able to specify only pathnames as arguments; not a queue name or form name. Therefore, if you don't want the default value for either queue name or form, you must specify the QPRINT keyword by itself, and proceed to the Print Files screen to specify the queue name and form name.

For example, suppose user Chris wants to print the file PRODUCT.LIST in the user directory :UDD:CHRIS on the default printer and on the default form. At any SMI menu, Chris could enter the following:

Enter choice: QPRINT :UDD:CHRIS:PRODUCT.LIST ⌡

The file would be sent to the default printer to await printing, and Chris could continue working at the current menu.

See the "Sample Session Using the Control Printers Menu," later in this section, for another example of printing a file.

Displaying the Contents of Print Queues (DISPLAY)

Option "2 Display contents of print queues" on the Control Printers Menu (keyword DISPLAY) lets you see what is currently in the print queue(s). You might want to do this, for example, to see where in a queue your print request is located, or to see if the print queue you want to use is open.

When you enter 2, the system will display the print queue(s). From this listing you can see which queues are open and which are closed; that is, which you can send requests to (open) and which you cannot (closed). The display will also show what requests are queued to each queue, if any. Each queued request will have a sequence number, name of the process that queued it, and the AOS/VS pathname to the queued file. For example, your listing of queue contents might look like the following:

```
BATCH__OUTPUT    PRINT     Open
* 1019 D     JORDAN    :UDD:JORDAN:?14.CLI.001.JOB

LPT             PRINT     Open
   1259 D    SYSMGR    :BACKUP.86.04.15



LQP             PRINT     Open
   1264     LEE       :UDD:LEE:QUARTERLY__REPORTS:Q186
   1265 N   LEE       :UTIL:FF
   1266     ROBIN     :UDD:ROBIN:REPORT
   1267     ROBIN     :UDD:ROBIN:LETTERS:EVANS
   1268 D   CEO__MGR  :CEO__FILES:CEO__MGR:043.DOC.LQ

LQP1            PRINT        Open
   934 A    JR        :UDD:COMMON:SYSTEM__NOTES
*  952     SULLY     :UDD:SULLY:EDITORIAL
   953     SANDY     :UDD:SANDY:PERSONAL:LIST

Flags explanation:
D  =  /DELETE
N  =  /NOTIFY
A  =  Unexpired /AFTER
*  =  Active
```

If your queue contents take up more than one screen, the screen will go into Page mode. This means one screen will display, and then the screen will freeze, as if you had typed CTRL-S. To scroll to the next screen, type CTRL-Q. When all the queue contents have been displayed, you can return to the Control Printers Menu by pressing NEW LINE.

Canceling a Queued Print Request (CANCEL)

Option "3 Cancel requests in print queues" on the Control Printers Menu lets you cancel any request you have made to a print queue. When you select 3, or specify the CANCEL keyword, the system will display the print queue(s) and prompt you for the sequence number(s) that you want removed. You can specify up to 10 sequence numbers. You can cancel any request that you have queued, whether it is currently active (marked with an asterisk on the queue display) or not. However, if a request has already completed, or was queued by another user, then you cannot cancel it.

(Users with the System Manager privilege can cancel requests queued by other users from the Manage Printers and Print Queues Menu, described later in this chapter in the "Administrative Functions" section.)

After you specify which request(s) you want to cancel, you will return to the Control Printers Menu.

Aligning the Printer Paper (ALIGN)

On occasion, you will have to align the paper in the printer; for example, after the printer runs out of paper and you add more, or if the paper gets bunched up and misaligns itself. When you want to realign the printer paper, select option 4 on the Control Printers Menu or specify the ALIGN keyword. The system will prompt you for the printer name. Be sure to type the printer name correctly.

*

When you have entered a valid printer name, the SMI will pause the current print request and prompt you for the number of pages you want reprinted, if any. If your print request came out skewed on the paper, or got bunched up, this option allows you to redo it.

If you want to reprint some pages after realigning the printer paper, specify the number you want and press NEW LINE. The default is 5 pages, counting back from the last page printed. If you don't want any, type 0 and press NEW LINE. The system will instruct you to go fix the alignment of the printer paper and to press NEW LINE when you are done. The system will then reprint the pages you specified, and return you to the Control Printers Menu.

Pausing a Printer (PAUSE)

Option "5 Pause a printer" on the Control Printers Menu lets you temporarily stop a printer. You might want to do this, for example, if you need to change the paper on the printer. Pausing the printer prevents any other jobs from printing until you continue the printer — option 6 on the Control Printers Menu.

When you select option "5 Pause a printer," or issue the PAUSE keyword, the system will prompt you to enter which printer you want paused. It will then return you to the Control Printers Menu. Be sure you type the printer name correctly.

*

See the "Sample Session Using the Control Printers Menu," later in this section, for an example of the "Pause a printer" option.

Continuing a Printer (CONTINUE)

If you have previously used option 5 to pause a printer, then option 6 "Continue a printer" allows you to restart it. When you select option 6, or specify the CONTINUE keyword, the system will prompt you to enter which printer you want continued. Enter the appropriate name, and you will return to the Control Printers Menu. Be sure to enter the printer name correctly.

*

See the "Sample Session Using the Control Printers Menu," later in this section, for an example of continuing a printer.

Clearing a Printer (CLEAR)

Option "7 Clear a printer" on the Control Printers Menu allows you to clear a printer that has become *hung*. A hung printer is one that has suspended printing for some reason. Clearing it often helps to get it working again. When you select option 7, or specify the CLEAR keyword, the system prompts you to enter the name of the printer you want cleared. Type the appropriate name and press NEW LINE. *Be sure to type the printer name correctly.* You will return to the Control Printers Menu.

*

For example, suppose PRINTER1 is hung. You would first be sure the printer's power was turned on and its READY light lit. If they were, you would then select option 7 on the Control Printers Menu, and type PRINTER1 at the prompt, as follows:

Printer: PRINTER1)

The system would then return you to the Control Printers Menu.

Sample Session Using the Control Printers Menu

Let's assume you are logged on to the system as SYSMGR. You want to print a large file in Sandy's user directory, called INVENTORY. But suppose you notice the paper has almost run out on your printer, and you want your INVENTORY file to be one large printout. If you queue it now the paper will run out in the middle of the file and you will have a break in the printout. So you decide to pause the printer, place a new box of paper on the printer, and then continue the printer and print your file. To do this, you might use the following steps:

1. Select option "5 Pause a printer" on the Control Printers Menu:

```
                         Control Printers Menu

         1  Print files
         2  Display contents of print queues
         3  Cancel requests in print queues
         4  Align printer paper
         5  Pause a printer
         6  Continue a printer
         7  Clear a printer












         Enter choice: 5 )
```

2. The Pause a Printer screen appears, at which you must specify the printer name, PRINTER1.

```
┌─────────────────────────────────────────────────────────────────────────

                            Pause a Printer

        Please enter the name of the printer you want to pause.

        Printer: PRINTER1 ↵





│
└─────────────────────────────────────────────────────────────────────────
```

The printer will pause when the currently printing job is finished (if there is one) and the Control Printers Menu will reappear on your screen.

3. Go to the printer, remove the nearly empty box of paper, put a new box of paper in place (being sure to align it correctly), and return to your terminal. (Later, when the new box of paper runs out, you can replace the nearly empty box and use it up for other jobs.)

4. Select option "6 Continue a printer."

```
┌─────────────────────────────────────────────────────────────────────────

                          Control Printers Menu

          .
          .
          .
        6  Continue a printer
        7  Clear a printer


        Enter choice: 6 ↵

│
└─────────────────────────────────────────────────────────────────────────
```

5. At the Continue a Printer screen, you specify the printer that you paused.

```
                        Continue a Printer

      Please enter the name of the printer that you want to continue.



   Printer: PRINTER1 ↵
```

6. The printer will continue processing its requests, and the Control Printers Menu will reappear on your screen. To queue your large file to print, select option "1 Print files."

```
                        Control Printers Menu

        1  Print files

        .

        .

        .


        Enter choice: 1 ↵
```

7. At the Print Files screen, type the pathname of the file and the name of the queue, and accept the default form name.

```
┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│                           Print Files                             │
│                                                                   │
│         .                                                         │
│         .                                                         │
│                                                                   │
│     Pathname: :UDD:SANDY:INVENTORY ⏎                              │
│                                                                   │
│     Queue name: LPT ⏎                                             │
│                                                                   │
│     Form name: DEFAULT ⏎                                          │
│                                                                   │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

8. The Control Printers Menu will reappear on your screen. To ensure the request has been queued, select option "2 Display contents of print queues."

```
┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│                      Control Printers Menu                        │
│                                                                   │
│          1  Print files                                           │
│          2  Display contents of print queues                      │
│          .                                                        │
│          .                                                        │
│          .                                                        │
│                                                                   │
│                                                                   │
│          Enter choice: 2 ⏎                                        │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

The system will display the print queue contents, as follows:

```
LPT             PRINT     Open
* 239           SYSMGR    :UDD:SANDY:INVENTORY

LQP             PRINT     Open
* 234           LEE       :UDD:LEE:PROG_REPORTS:JUN-86
  235 N         LEE       :UTIL:FF
  236           ROBIN     :UDD:ROBIN:Q3_SUMMARY
  238           CEO_MGR   :CEO_FILES:CEO_MGR:032.DOC.LQ

Flags explanation:
N = /NOTIFY
* = Active
```

The file appears as sequence number 239 in the LPT queue, and it is already printing or "active."

9. Now suppose user Sandy comes and tells you that the file you are printing is obsolete; the file you really need is called INVENTORY2. You can stop the print request by selecting option "3 Cancel requests in print queues" on the Control Printers Menu.

```
                          Control Printers Menu


          .
          .
          .
        3  Cancel requests in print queues

          .

          .

          .


        Enter choice: 3 ⏎
```

10. The system will display the print queue contents and prompt you for the sequence number. Enter it as follows:

```
LPT             PRINT     Open
* 239           SYSMGR    :UDD:SANDY:INVENTORY
  241           LEE       :UDD:LEE:SYSTEM__NOTES
  242 N         LEE       :UTIL:FF
LQP             PRINT     Open
* 236           ROBIN     :UDD:ROBIN:Q3__SUMMARY
  238           CEO__MGR  :CEO__FILES:CEO__MGR:032.DOC.LQ
  240           CHRIS     :UDD:CHRIS:EQUIPMENT.LIST


Flags explanation:
N = /NOTIFY
* = Active
```

Enter the sequence number of each request you want to cancel:
239 ⏎

11. The system will cancel the printing request and redisplay the Control Printers Menu. Now you can queue the correct file by selecting option "1 Print files" again.

```
                    Control Printers Menu

        1  Print files

        .

        .

        .


        Enter choice:  1 ⏎
```

12. At the Print Files screen, type the pathname of the file and the queue name for the printer, and accept the default form name.

```
                              Print Files



         .

         .

         .


      Pathname: :UDD:SANDY:INVENTORY2 ↵

      Queue name: LPT ↵

      Form name: DEFAULT ↵
```

The system will return you to the Control Printers Menu. When the file is printed, you can pick it up at the printer.

Backing Up or Restoring Files (ARCHIVE)

Option "3 Backup (dump) or restore (load) files" on the SMI Main Menu allows any user to back up (dump) files or restore (load) previously backed-up files. This menu option applies to both personal file backups and system-wide backups. You can also select this option by specifying the ARCHIVE keyword from anywhere in the SMI menu series.

Before you select this option, be sure you know the following:

*   Whether you are backing up or restoring files.

*   Which type of media you are using — tape or diskettes.

*   Which type of files you are using — personal (individual user) or system-wide (all users)

*   For system-wide backup/restore, whether the operation will be full or incremental.

*   Which files you are backing up or restoring.

Once you have all of this information, select option 3. The system will then present the Archive (Back Up or Restore Files) Menu, which is described in Chapter 4, "Backing Up and Restoring Files."

Read Chapter 4 before you attempt to back up or restore any files. It explains the purpose of file backup as well as the method by which you will back up and restore files.

Performing Administrative Functions (ADMIN)

You will see option "4 Perform administrative functions" on the SMI Main Menu only if you have the System Manager privilege in your user profile. These functions are restricted in this way because they should be performed only by designated system management users; nonprivileged users could unknowingly cause damage to the system or its other users if they had access to the restricted functions.

If you have the required privilege and want to perform restricted administrative functions, type 4 and press NEW LINE. We discuss the Administrative Functions Menu and its options in the next major section of this chapter.

Running the Interactive System Management Tutorial (TUTORIAL)

Option "5 Run the interactive system management tutorial" on the SMI Main Menu allows users with the System Manager privilege to run the tutorial that we described in Chapter 1. If you want to run the tutorial, type 5 and press NEW LINE from the SMI Main Menu, or use the keyword TUTORIAL from anywhere in the SMI menu series. The tutorial explains how to proceed and how to return to the SMI program. You can run the tutorial for as long or as short a time period as you want. It has several lessons, which you can run in any order you like, and you run only the lessons and portions of each lesson that you want. We recommend that for your first time using the tutorial, you follow the lessons in the order in which they appear on the tutorial's main menu.

Chapter 1 describes the system management tutorial in more detail.

The rest of this chapter is for the

System Manager   ☑

System User   ☐

The Administrative Functions Menu

You can get to the Administrative Functions Menu by selecting option "4 Perform administrative functions" on the SMI Main Menu or by entering the keyword ADMIN from any menu screen in the SMI program. But you must have the System Manager privilege in your profile to display the Administrative Functions Menu or any of its subordinate menus or command screens. To perform most of the functions available through these menus, you also need the Superuser privilege or the Superprocess privilege, or both.

The Administrative Functions Menu appears in Figure 3-3.

```
SMI Rev nn.nn.nn.nn                              dd-mmm-yy hh:mm

                     Administrative Functions Menu

        1  Manage user profiles
        2  Manage consoles
        3  Customize the system
        4  Manage printers and print queues
        5  Control printer forms
        6  Manage the batch queue
        7  Send a command to the master CLI process
        8  Shut down the system




        Enter choice:




        To exit from any menu, press the Cancel/Exit key (F11).
        For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-3. Administrative Functions Menu

You can exit from the Administrative Functions Menu at any time by pressing the Cancel/Exit function key (F11). You will return to the SMI Main Menu. To select any choice off the Administrative Functions Menu, type its number and press NEW LINE. The following sections explain each menu option.

Managing User Profiles (PROFILES)

Each person who needs to use your system must have a valid user profile. Only users with the Superuser privilege can create, modify, or delete user profiles. If you select option "1 Manage user profiles" on the Administrative Functions Menu, the Manage User Profiles Menu will appear, as shown in Figure 3-4. You can also get to this menu by issuing the keyword PROFILES from any SMI menu screen.

```
SMI Rev nn.nn.nn.nn                                  dd-mmm-yy hh:mm


                      Manage User Profiles Menu

          1  Create a user profile
          2  Modify a user profile
          3  Delete a user profile

















          Enter choice:




      To exit from any menu, press the Cancel/Exit key (F11).
      For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-4. Manage User Profiles Menu

To return to the Administrative Functions Menu, press the Cancel/Exit function key (F11).

Creating a User Profile (CREATE)

Select option "1 Create a user profile" on the Manage User Profiles Menu when you want to create a new user profile. The screen shown in Figure 3-5 will appear. You can also get this screen by using the CREATE keyword. Note that the default responses for all prompts except username and password will appear on the screen.

```
┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│   SMI Rev nn.nn.nn.nn                          dd-mmm-yy hh:mm     │
│                                                                   │
│                       Create a User Profile                       │
│                                                                   │
│      Please fill in the blanks with the information requested.    │
│                                                                   │
│      Username (1 - 15 characters):                                │
│                                                                   │
│      Password (6 - 15 characters):                                │
│                                                                   │
│      Will this user need to perform system management tasks (Y or N)? N │
│                                                                   │
│      Initial program to run when user logs on:   :CLI.PR          │
│                                                                   │
│      Initial command (IPC) file:   :SETUP.CLI                     │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│      To exit from any menu, press the Cancel/Exit key (F11).      │
│      For assistance at any time, press the Help key (SHIFT-F1).   │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

Figure 3-5. Create a User Profile Screen

To create a new user profile, just fill in the blanks as indicated. The first prompts ask for a username and a password for the new profile. Be sure you enter a username between 1 and 15 characters in length, and a password between 6 and 15 characters. Allowable characters for username are A through Z, 0 through 9, underscore (_), period (.), question mark (?), and dollar sign ($). If you enter a username that already has an existing profile, you will receive an error message and will have to enter a different username. For the password, you can use any printable characters on the keyboard except the caret (^) character.

The next question asks if the profile will be for a user who will need to perform system management tasks. If you answer no (the default), the profile will be that of a regular system user. If you answer yes, the user will have the System Manager profile, which contains the privileges Superuser, Superprocess, and System Manager. We discussed these two types of profiles in the User Profiles section, earlier in this chapter.

Next, the screen asks for the initial program. Enter the pathname of the program you want this user to be running every time he or she logs on; that is, the CLI, SMI, CEO, or an application program. For example, for the CLI, you would enter :CLI.PR and for CEO, :UTIL:CEO_DIR:CEO_CP.PR. The default is :CLI.PR. (Refer back to the section "AOS/VS File System" in Chapter 1 for a quick review of pathnames.) Note that this pathname is restricted to 63 characters.

Finally, enter the pathname of the initial IPC file (or press ERASE EOL or CR to erase the default response if you don't want to specify an IPC file). The IPC file is a small command file that executes each time the user logs on. It typically contains instructions

that set default ACLs for the user's files and a default search list, so you might want each user to have the same IPC file. The filename should be easy to remember; a common choice is :SETUP.CLI.

The IPC file also often contains a call to a macro of the same name located in the user's own directory. Users can then edit the SETUP.CLI files located in their own directories to contain whatever they want, and these instructions will execute after those in the initial IPC file that you set up. Note that the IPC pathname is restricted to 63 characters.

While you are entering information, you can return to a previous field by using the uparrow (or Cursor Up) key or by pressing the Back Field function key (SHIFT-F11). You can move ahead to any field by pressing NEW LINE or the downarrow. When you are finished entering information, press NEW LINE at the "Initial command (IPC) file:" prompt, or press the Execute key (F1) from anywhere on the screen. You will return to the Manage User Profiles Menu. The new profile will be in effect immediately and the user can log on.

Figure 3-6 shows a sample Create a User Profile screen with responses entered. The profile is for a regular system user, whose username will be LEE. LEE's initial password will be KINGSTON, initial program will be the CLI, and initial IPC file will be :SETUP.CLI.

```
SMI Rev nn.nn.nn.nn                              dd-mmm-yy hh:mm

                        Create a User Profile

 Please fill in the blanks with the information requested.

 Username (1 - 15 characters):  LEE

 Password (6 - 15 characters):  KINGSTON

 Will this user need to perform system management tasks (Y or N)? N

 Initial program to run when user logs on:  :CLI.PR

 Initial command (IPC) File:  :SETUP.CLI




                              .


 To exit from any menu, press the Cancel/Exit key (F11).
 For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-6. Sample Create a User Profile Screen

Modifying a User Profile (MODIFY)

If you want to modify a user profile that already exists, select option "2 Modify a user profile" on the Manage User Profiles Menu, or specify the keyword MODIFY from anywhere in the SMI menu series. A screen will appear, prompting you to enter the username of the profile you want to modify. Enter a username. If you enter a username that does not have an existing profile, you will receive an error message and will have to enter a different username.

After you enter the username, the remaining prompts will appear. The profile's current settings will display as the defaults, with the exception of the password, which will not display for security reasons. To accept any of the current settings, including the password, just press NEW LINE. To change any, type the new information and press NEW LINE. If you make any mistakes, you can use the Back Field key (SHIFT-F11) or the uparrow to return to a previous entry on the screen.

Note that the one piece of information in a profile you cannot change is the username. This is because the system uses this name to refer to the profile.

When you have finished entering the profile information, press NEW LINE from the prompt for the initial IPC, or press the Execute key (F1) from anywhere on the screen. You will return to the Manage User Profiles Menu.

For example, suppose we want to modify the profile of user LEE, whose profile we just created in the above example. We meant to give LEE the System Manager profile; but when we created the profile, we specified that LEE would not be performing system management tasks. Using option "2 Modify a user profile" on the Manage User Profiles Menu, we can change that now. After selecting option 2, we answer LEE to the "Username:" prompt on the Modify a User Profile screen, as follows:

Username: **LEE**)

The system will take this username and find its existing profile, and display the information in the profile as default answers to the remaining prompts on the Modify a User Profile screen, as shown in Figure 3-7.

```
SMI Rev nn.nn.nn.nn                                    dd-mmm-yy hh:mm

                         Modify a User Profile

   Enter a username. The existing values for that profile will appear
   as defaults.

   Username:  LEE

   Password (6 - 15 characters):

   Will this user need to perform system management tasks (Y or N)? NO

   Initial program to run when user logs on:   :CLI.PR

   Initial command (IPC) File:   :SETUP.CLI




   To exit from any menu, press the Cancel/Exit key (F11).
   For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-7. Sample Modify a User Profile Screen

Our cursor will be positioned after the password prompt. Using the NEW LINE key or the downarrow key, we can get to the next field, which we want to change. We then type Y over the N, press the space bar once to erase the O, and press NEW LINE, as follows:

Will this user need to perform system management tasks (Y or N)? Y□⌐

The word YES will appear where NO used to be. Since we want to keep the rest of the screen the same, we can either press NEW LINE two more times, to accept the values for initial program and initial IPC file, or we can simply press the Execute key (F1) to specify that we want to accept all values as they now appear on the screen.

Deleting a User Profile (DELETE)

When you select option "3 Delete a user profile" on the Manage User Profiles Menu, the system will prompt you for the username whose profile you want to delete. *Be sure no one will ever need to use that profile again before you delete it.* If you are sure that you want to delete the user's profile, type the username and press NEW LINE. For example, suppose user SULLY no longer works in your department and you want to delete SULLY's user profile. The prompt and your entry would look like the following:

Enter the username of the profile you want to delete: SULLY ⌐

Note that deleting a user's profile does *not* delete that user's directory in :UDD. You can still access the files there, or delete the directory if no one needs it. The SMI program will remind you of this, and give you the option of deleting the directory. *Be absolutely*
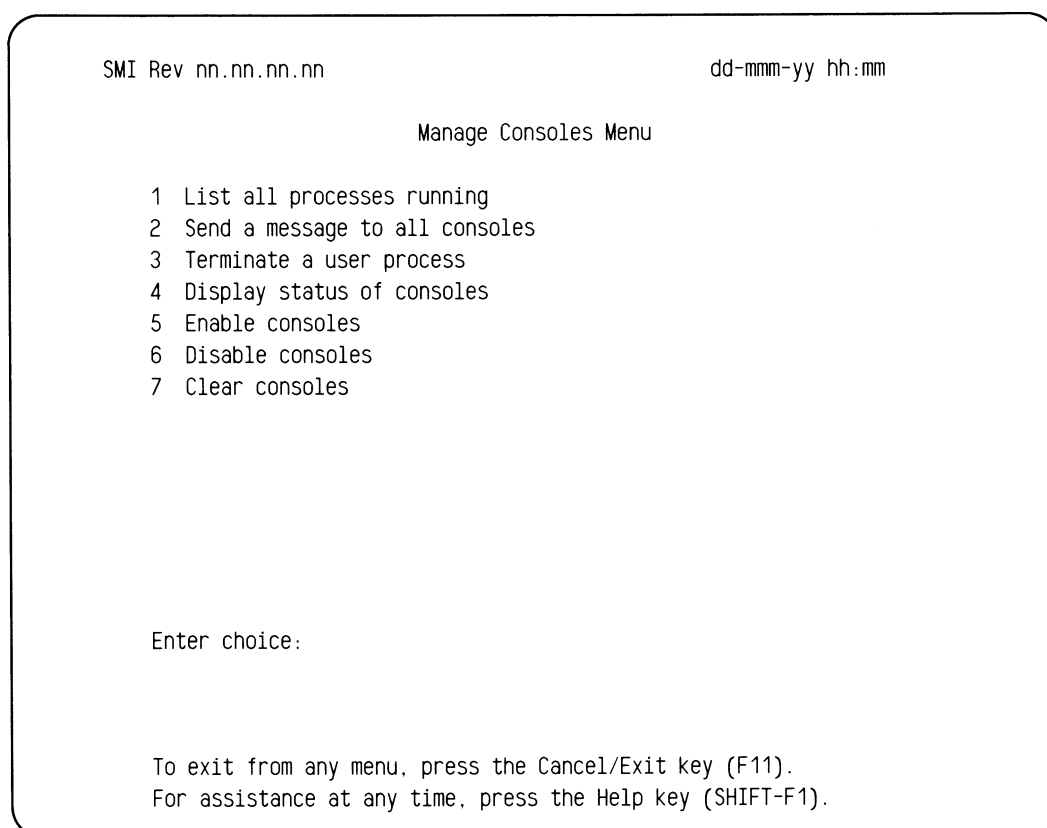
certain no one will need to use any of this user's files before you delete the directory. Once you've deleted it, you will have only your system-wide backups and the user's personal file backups (if any) from which to restore any of this user's files.

Note that if you don't delete the user's :UDD directory when you delete the profile, you won't be able to create a new profile with that username. If you attempt to, you will receive a *Username directory already exists* error message. If you subsequently want to delete this directory, you will have to use the CLI to do so. You might want to back up the directory to tape or diskettes first.

You can also get to the Delete a User Profile screen by issuing the keyword DELETE from any SMI menu.

Managing Consoles (CONSOLES)

Option "2 Manage consoles" on the Administrative Functions Menu allows you to perform a number of functions involving other system users. The Manage Consoles Menu appears in Figure 3-8. You can also get to this menu by using the CONSOLES keyword.

```
SMI Rev nn.nn.nn.nn                              dd-mmm-yy hh:mm


                          Manage Consoles Menu


          1  List all processes running
          2  Send a message to all consoles
          3  Terminate a user process
          4  Display status of consoles
          5  Enable consoles
          6  Disable consoles
          7  Clear consoles








          Enter choice:




          To exit from any menu, press the Cancel/Exit key (F11).
          For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-8. Manage Consoles Menu

To return to the Administrative Functions Menu from the Manage Consoles Menu, press the Cancel/Exit function key, F11.

All of the options on the Manage Consoles Menu also apply to windows on pixel-mapped terminals. The system treats each window as if it were an individual console.

When you specify a console name for any option on the Manage Consoles Menu, use the name without the preceding @ sign; for example, CON8, CON12, and not @CON8 or @CON12. Similarly, specify window names without the preceding @ sign on the console name. For example, if you have a window called WIN2 on a pixel-mapped terminal called PMAP1, you would specify PMAP1:WIN2 as the console name.

NOTE: To create and manipulate windows, you must have an application program. *AOS/VS System Concepts* describes the system calls you need to implement such a program.

Listing All Processes Running (WHOS)

Option "1 List all processes running" on the Manage Consoles Menu allows you to list all of the active processes on your system. This information is useful for several reasons; for example, you might want to know if a certain system user is logged on, or you might want to know someone's process ID (PID) number so you can send a message.

When you select option 1, or specify the WHOS keyword, you will receive a list of processes running, each of which specifies a PID, a username, and what program is running. For example, your list might look something like the following:

```
Elapsed  7:04:52, CPU  0:00:32.725, I/O Blocks  28, Page Secs 7362
PID:      1 PMGR           PMGR           :PMGR.PR
PID:      2 OP             OP             :CLI.PR
PID:      3 OP             EXEC           :UTIL:EXEC.PR
PID:      4 OP             CON4           :UTIL:XLPT.PR
PID:      5 CEO_MGR        CEO_FSA        :UTIL:CEO_DIR:CEO_FSA.PR
PID:      6 SYSMGR         CON2           :UTIL:SMI.PR
PID:      7 OP             NETOP          :NET:NETOP.PR
PID:      8 OP             X25_LMGR       :NET:X25-LMGR.PR
PID:      9 CHRIS          CON21          :CLI.PR
PID:     10 KRUPP          VCON1          :CLI.PR
PID:     11 OP             011            :LOCK_CLI.PR
PID:     12 OP             INFOS_II       :INFOS:INFOS_II.PR
PID:     13 JR             CON5           :CLI.PR
PID:     14 CEO_MGR        CEO_LOG        :UTIL:CEO_DIR:CEO_LOG.PR
PID:     15 CEO_MGR        CEO_POA        :UTIL:CEO_DIR:CEO_POA.PR
PID:     16 CEO_MGR        CEO_CSA        :UTIL:CEO_DIR:CEO_CSA.PR
PID:     17 CEO_MGR        CEO_QMA        :UTIL:CEO_DIR:CEO_QMA.PR
PID:     18 SYSMGR         00018          :CLI.PR
PID:     20 ASHLEY         CON13          :CLI.PR
PID:     21 LEE            VCON3          :CLI.PR
```

Suppose you are user SYSMGR. This display shows that you are running the SMI (:UTIL:SMI.PR) as PID 6, on the console CON2, and that you also have a CLI process running as PID 18. (PID 18 is the process that is performing the "List all processes running" request.)

Aside from active processes, this display tells you how long your system has been running. The value listed after "Elapsed" indicates this in the format hh:mm:ss. In this example, the system has been running just over 7 hours.

If the list of processes is too long to fit on one screen, the system will put the screen in Page mode. That is, once the screen is full, it will freeze. To make it scroll up, use the

CTRL-Q sequence (press and hold the CTRL key; then press Q). Once the end of the list is displayed, the system will prompt you to return to the Manage Consoles Menu by pressing NEW LINE.

Sending a Message to All Consoles (BROADCAST)

Option "2 Send a message to all consoles" on the Manage Consoles Menu allows you to broadcast a message to all running processes. You might want to do this, for example, if you want to remind all users about a meeting, or if you want to tell users what time the system will be coming down. The keyword for this option is BROADCAST, and it will take arguments. That is, from any SMI menu, you can type BROADCAST followed by the entire message you want to send. Once you press NEW LINE, the system will send the message to all consoles.

When you select option 2 or type BROADCAST with no arguments, the system will prompt you to type the message you want to broadcast. It will then send the message to all consoles logged on, including yours, so you will be able to verify that the message was sent out. You can then return to the Manage Consoles Menu by pressing NEW LINE.

Figure 3-9 shows a sample dialog of what happens once you select option 2 on the Manage Consoles Menu.

```
                    Send a Message to All Consoles


   Type the message you want to send to all system users; then
   press NEW LINE.


   The system will be coming down at 5:00 p.m. today. )


   From Pid   n :   {SYSMGR} - The system will be coming down at
   5:00 p.m. today.


   Press NEW LINE to continue.
```
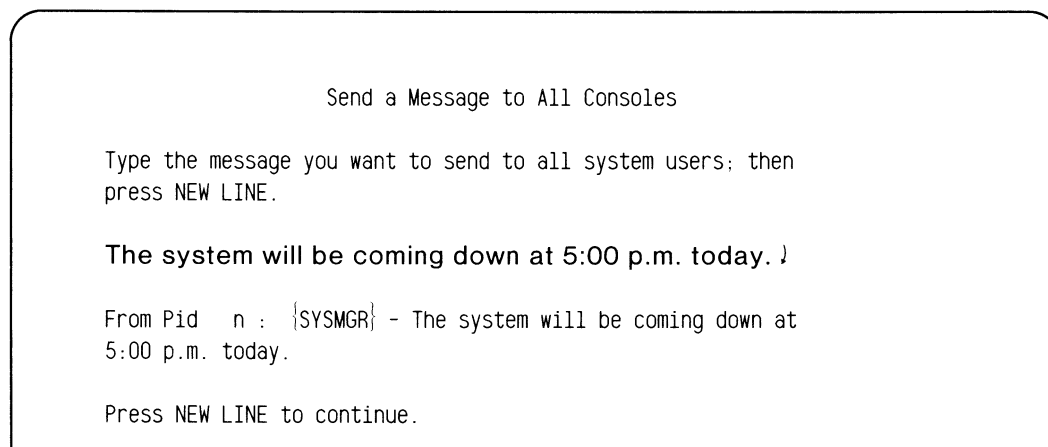
Figure 3-9. Sample Broadcast Message

Note that you could receive the prompt to press NEW LINE and return to the Manage Consoles Menu before you receive the broadcast message on your screen. If the message appears on your menu screen, you can refresh the screen by pressing the ERASE PAGE key.

Terminating a User Process (TERMINATE)

You might need to terminate a user process if, for example, a user gets *hung* in a program. (The term hung means the state in which the program is running, but nothing is happening; the process is suspended indefinitely.) Or sometimes a user will accidentally attempt to type out a nonprintable program file on a terminal screen, which could cause it to emit strange characters and beeping sounds for several minutes. Rather than sitting through this, the user might ask you to terminate his or her process.

Before terminating anyone, you need to know the user's process ID (PID) number. When you select option "3 Terminate a user process," (or use the keyword TERMINATE) the

system will display a list of all processes running on the system. (See the sample listing under "Listing All Processes Running," above.) If the list of processes is longer than one screen, the system will place the screen in Page mode. This means the screen will freeze when it is full, and you will have to press CTRL-Q to continue it to the next screen.

When all current processes have been displayed, the system will prompt you to enter a PID for each process you want to terminate. Type the number(s) (up to a total of 10) and press NEW LINE. The system will then return to the Manage Consoles Menu.

If you want to check to be sure the PID you specified was terminated, you can then select option "1 List all processes running" on the Manage Consoles Menu. The PID(s) you specified to terminate should no longer appear on the list.

NOTE: The SMI will allow you to specify only PIDs greater than 4. This is to prevent you from causing an abnormal shutdown of EXEC or the system.

Displaying Status of Consoles (CSTATUS)

Option "4 Display status of consoles" on the Manage Consoles Menu allows you to see the status of consoles on the system. The keyword for this option is CSTATUS. When you select this option, the system will prompt you to enter the names of the consoles whose status you want to see. You can specify up to seven console names, or press NEW LINE to display the status of all consoles. If the status display takes up more than one screen, the SMI will display the status of several consoles at a time, and then prompt you to press NEW LINE to scroll the screen.

Console status for each console consists of a message from the EXEC process, telling you the console is *enabled*; that is, ready to use on the system, and what user, if any, is logged on. It also tells you how many attempts a user has to log on at that console; that is, if a user enters an incorrect username/password pair, how many times the console will accept log-on attempts before temporarily locking.

You will receive a *CONSOLE UNKNOWN TO EXEC* message for any console you specify that is not enabled; EXEC is aware only of consoles that are enabled. And if you specify a console that does not exist, you will generate a *File does not exist* error message, which could overwrite some of the information on your screen. Be sure to specify only the names of consoles for which there is an entry in the :PER directory; that is, consoles numbered 2 through 28 and 0. (CON0 is the system console.) Note that you may or may not have an actual console cabled to each console line, but the system will still consider the consoles to exist if they are defined in :PER.

For example, suppose you specify the consoles CON2, CON3, CON4, CON5, CON6, VCON0, and VCON1. Your console status display might look like the following:

```
@CON2   Enabled, Logon tries =   5, Continue, PID:   14, User = CRH
@CON3   Enabled, Logon tries =   5, Continue, PID:   11, User = SYSMGR
CONSOLE UNKNOWN TO EXEC
@CON5   Enabled, Logon tries =   5, Continue, PID:   21, User = CAREY
@CON6   Enabled, Logon tries =   5, Continue, PID:   12, User = LEE
@VCON0  Enabled, Logon tries =   5, Continue, Not logged on
CONSOLE UNKNOWN TO EXEC
```

From this display, you can see that CON4 and VCON1 are not enabled, but the rest of the specified consoles are. All enabled consoles except VCON0 have users currently logged on.

At the end of the display, the system will prompt you to press NEW LINE to return to the Manage Consoles Menu.

Enabling Consoles (CENABLE)

Before any users can log on to their terminals, the consoles must be enabled. This is done automatically when your system comes up; however, if you disable any consoles from logging on (which is option 6 on the Manage Consoles Menu), you can use the Enable consoles option to re-enable them. Select option "5 Enable consoles" on the Manage Consoles Menu or use the CENABLE keyword. The system will prompt you to enter the console name(s) that you want enabled, or to press NEW LINE if you want to enable all consoles. You can specify up to 10 separate console names.

The console names are the names displayed when you select option "4 Display status of consoles" on the Manage Consoles Menu; for example, CON2 or VCON0. These names identify the consoles to the system. You must type the names without the preceding @ sign that appears on the status display. For example, suppose you have selected the console status option described above and received the status listing pictured. You see by the listing that consoles CON4 and VCON1 aren't enabled. You can enable them by responding to the prompt on the Enable Consoles screen as follows:

Console(s): CON4 VCON1 ⌡

You will then be prompted to press NEW LINE to return to the Manage Consoles Menu. If you want to check to be sure the consoles you specified were enabled, you can use option 4 to display console status again. CON4 and VCON1 should now appear on the listing as enabled.

Disabling Consoles (CDISABLE)

At times, you may want to disable all or some users from logging on, for security reasons. Select option "6 Disable consoles" on the Manage Consoles Menu or use the CDISABLE keyword. The system will prompt you to enter a console name or names. You can specify up to 10 console names. Or you can indicate that you want all consoles disabled by pressing NEW LINE at the prompt. The system will then return you to the Manage Consoles Menu. From there, you can select option 4 to ensure that the consoles you specified were disabled. (EXEC outputs the message *CONSOLE UNKNOWN TO EXEC* for a disabled console.) You can subsequently re-enable the consoles with option "5 Enable consoles" on the Manage Consoles Menu.

Clearing Consoles (CCLEAR)

Option "7 Clear a console" on the Manage Consoles Menu allows you to clear a console that has become hung for some reason. When you enter 7, or specify the CCLEAR keyword, the system will prompt you to enter which consoles you would like cleared. Enter the console name(s) (up to 10) as prompted, using the same naming format as for the other options on the Manage Consoles Menu. For example, suppose user Sandy on the pixel-mapped terminal PMAP1 tells you the program running in WINDOW1 is hung. You select option 7 and receive the Clear a Console screen. You respond to the prompt in the following way:

Console(s): PMAP1:WINDOW1 ⌡

You will then return to the Manage Consoles Menu. User Sandy would then return to the console to ensure that the window was working properly.

this arrangement of lines. For example, if you define the line for CON8, the SMI associates this information with the third line on the LAC located in slot A, regardless of how you may have marked this line while setting up your machine.

NOTE: If you have one or two LAC boards, it is best that you put your terminals, printers, and modems on the lines on the LAC boards rather than the lines on the system board, for performance reasons.

Note that you can put modems only on the first line of the system board and the eleventh and twelfth lines of an asynchronous communications board. That is, modems can go on CON2, CON16, CON17, CON28, and CON29. If you define a line other than one of these for a modem, you will not receive an error message, but your modem will not work correctly.

When you enter console numbers, omit the CON; that is, type just the number. For example, to specify CON22 you would type 22. Note that you can specify console number ranges, but if you do, don't put spaces between the numbers and the hyphen, and don't use the word to or through. For example, to define consoles CON6, CON7, CON8, and CON9 you could respond to the prompt as follows:

Which console lines do you want to define?
(Type console numbers or ranges): 6-9 ⟩

After you specify the lines you want to define, you will then see Define a Console Line screens — one screen for each line on your system that you want to define.

NOTE: If you have a printer with CTS hardware flow control, it must go on one of the lines available for modems; that is, CON2, CON16, CON17, CON28, and CON29. *But you must still define it as a printer.* After you have finished configuring console lines, you will have to edit the macro that the SMI creates to generate these lines at system startup. The macro, :UP_LINES.CLI, contains specifications for characteristics for each line you define.

To edit the line for your printer with hardware flow control, find the line that begins with CHARACTERISTICS and ends with the console line that this printer is on. For example, if the printer is on line CON28, the macro line will look something like this:

CHARACTERISTICS/1=IGNORE/2=IGNORE/DEFAULT..../OFC..... @CON28

To make the printer work correctly, simply change the /OFC to read /HOFC, being careful not to add any extra spaces or delete any other characters. The line will then look something like this:

CHARACTERISTICS/1=IGNORE/2=IGNORE/DEFAULT..../HOFC..... @CON28

Note that if you subsequently define more lines via SMI, you will have to edit :UP_LINES.CLI again to make this change. This is because the SMI deletes and recreates the :UP_LINES.CLI macro every time you use the "Define console lines" option, so your previous edits will be lost.

The Define a Console Line screen appears in Figure 3-13.

```
SMI Rev. nn.nn.nn.nn                                    dd-mmm-yy hh:mm

                          Define a Console Line

  Console: CON6

  Baud rate for this line (300 1200 1800 2400 3600 4800 9600):  9600

  Is there a modem on this line (Y or N)?                   NO

  Is there a printer on this line (Y or N)?                 NO
```

Figure 3-13. Define a Console Line Screen

The *baud rate* indicates the speed at which a line or modem can transfer data, in bits per second. The standard (and default) baud rate for consoles is 9600. For modems it is 1200. Since each character requires 10 bits, characters are transferred at 1/10 the baud rate; that is, 960 characters per second for consoles and 120 characters per second for modems, using the default values. Type the value you want and press NEW LINE.

NOTE: If you specify a baud rate that is too high on a letter-quality printer, you might receive Data Overrun or Data Check errors. A baud rate of 2400 is appropriate for most letter-quality printers. If you still receive errors on your printer with the baud rate at 2400, reset it to 1200. Be sure to set the baud rate switch on the printer itself to the same value. Then shut the system down and start it up again, to make the new value take effect.

The next two questions allow you to specify if the line has a modem or printer on it. *Don't answer Y (Yes) to both of these prompts.* You can't have both a modem and a printer on a line.

If you answer Y to the last question, indicating the line has a serial printer on it, four more questions will appear on the bottom of the screen, as shown in Figure 3-14.

```
  ┌─────────────────────────────────────────────────────────────────┐
  │                                                                   │
  │   SMI Rev. nn.nn.nn.nn                        dd-mmm-yy hh:mm      │
  │                                                                   │
  │                      Define a Console Line                        │
  │                                                                   │
  │   Console: CON6                                                   │
  │                                                                   │
  │   Baud rate for this line (300 1200 1900 2400 3200 4800 9600): 1200│
  │                                                                   │
  │   Is there a modem on this line (Y or N)?              NO          │
  │                                                                   │
  │   Is there a printer on this line (Y or N)?           YES         │
  │                                                                   │
  │   Number of characters to print per line (1 - 255):   80          │
  │                                                                   │
  │   Number of lines to print per page (1 - 144):        66          │
  │                                                                   │
  │   Printer name:                                                   │
  │                                                                   │
  │   Will this printer be the default printer (Y or N)?  NO          │
  │                                                                   │
  │                                                                   │
  └─────────────────────────────────────────────────────────────────┘
```

Figure 3-14. Define a Console Line Screen with Printer Questions

Press NEW LINE if you want to accept a default value. Once you've answered all of the prompts and questions, or pressed the Execute key to indicate that all information on the screen is correct, you will receive the Define a Console Line screen for the next console. When you are finished specifying the lines, you will return to the Specify System Configuration Menu. Note that the values for characters per line and lines per page will take effect for the default printer only.

While at the Define a Console Line screen, you can use the arrow keys (Cursor Up and Cursor Down) to move between input fields if you want to change any of your answers.

If you press the Cancel/Exit function key while at the Define a Console Line screen, the values at the current screen will be discarded, but any other lines that you already defined will still be defined. For example, suppose you specify that you want to define consoles 4, 6, 7, and 10 when prompted for console numbers. Subsequently, you fill in the Define a Console Line screen for CON4 and CON6, but then press Cancel/Exit while defining CON7. The values for CON4 and CON6 will remain intact, but CON7 and CON10 will not have been defined.

However, processing for CON4 and CON6 won't be complete, because you interrupted the process. You won't have to redefine these lines, but you will have to subsequently use the Define Console Lines option again and run it to completion (that is, don't interrupt by pressing Cancel/Exit). Therefore, you would select the Define Console Lines option again and define CON7 and CON10. The system would then have the information for all four lines.

When you give a printer a name, it's a good idea to write this name down, along with the location of the printer. Then tape a name tag on each printer so all its users will know which printer to specify on requests to SMI. Be sure to give each printer a different name, and don't give any printer a name that you intend to give to a queue. Both printer and queue names are stored in :PER, which cannot have two filenames the same.

Give each printer a valid filename, or you can use its device name as its filename; for example, @CON12. (The SMI will interpret the @ sign to mean the :PER directory.) If you specify a name that already exists in the :PER directory, you will receive a *Name already exists* error.

If you specify more than one printer to be the default printer, SMI will assume that the default printer is the last one that you specified that way. It will also make the UP macro start the queues LPT, BATCH_LIST, and BATCH_OUTPUT to the default printer.

Any nondefault printer that you define on a console line will need to have its console line disabled (only lines for terminals should be enabled) and a queue started to it, or else it will not be usable. There are two methods for doing these tasks, depending on how you will use the printer. Follow the instructions under (a) or (b) below; *do not* do both. Note that (a) is a permanent solution; it needs to be done only once. Solution (b) is temporary; it must be performed every time the system is brought up.

(a) Printer That Will Be On the Same Console Line Permanently

If your printer will remain on one console line indefinitely, follow these steps:

1. Define the printer at the Define Console Lines screen.

2. From the Manage Consoles Menu, disable the printer's console line, specifying its console name (for example, CON16).

3. Create a queue and associate it with the printer, specifying the name you gave the printer when you defined it in step 1. (Use option "4 Create a print queue" of the Manage Printers and Print Queues Menu.)

4. Select option "5 Edit the UP macro" on the Customize the System Menu.

5. Add the following lines to the UP macro after the line that calls the UP_LINES macro:

   ```
   CONTROL @EXEC START queuename @printername
   PAUSE 3
   CONTROL @EXEC SILENCE @printername
   CONTROL @EXEC CONTINUE @printername
   ```

   where "queuename" is the name of the queue you created in step 3, and "printername" is the name you gave the printer at the Define Console Line screen.

The printer will be usable now and for every subsequent startup.

(b) Printer That Is Likely to Be Moved from Line to Line

If you have a nondefault printer that is likely to be moved from line to line, use the following steps. (This might be the case, for example, if you have a very high-quality printer that several different people might need to use from time to time, and might therefore move from office to office.)

1. Define the printer at the Define Console Lines screen.

2. From the Manage Consoles Menu, disable the printer's console line, specifying its console name (for example, CON16).

3. Start a queue to the printer, specifying the name you gave the printer when you defined it in step 1. (Use option "8 Start a print queue" of the Manage Printers and Print Queues Menu.)

The printer will then be usable.

Note that this solution is to be used only for a printer that you are likely to move often, because *it must be repeated every time the system is brought up*. For a long term solution, use the steps listed under part (a), above.

The information you specify for system configuration will take effect at your next powerup. That is, you must power off and on again in order for the system to use this information. The exceptions are the default backup/install medium, and the default printer, which take effect immediately. Note, however, that the queues which start up automatically to the default printer will do so only for subsequent powerups, because they are started via the UP macro. To use these queues now, you will have to start them explicitly. See the "Managing Printers and Print Queues" section, later in this chapter.

Installing Software (INSTALL)

Option "2 Install software" on the Customize the System Menu lets you install software on your system, such as CEO or a programming language. You can also select this option by specifying the INSTALL keyword from anywhere within the SMI menu series. Have your tape or diskettes at hand when you select this option, and the Release Notice for the software product you intend to install.

NOTE: Do not write-protect any diskette from which you intend to install software. We describe write-protection in Chapter 4.

Use the INSTALL keyword, or select option "2 Install software" on the Customize the System Menu. You will see the Install Software screen. The screen has the following prompts and default values:

Media type (T = Tape, D = Diskette):
T

Directory:
:

Files: (Specify filenames and/or templates.)
#

(Note that the default for media type will be whatever you specified as your default media type at the Specify System Configuration screen.) At the "Media type:" prompt, enter T for tape or D for diskette. For example, if you will be loading software from diskettes, respond to the prompt as follows:

Media type (T = Tape, D = Diskette):
D ∤

To determine your response to the next prompt, look at the Release Notice for the software product you are installing. Locate the portion of your Release Notice that gives the load instructions. It will tell you which directory you must load the software into. The default is the root (:). Suppose you are loading FORTRAN 77 software, and the FORTRAN 77

Release Notice says to make :UTIL:F77 the working directory. You will answer the first prompt as follows:

Directory:
:UTIL:F77 ⌡

The SMI will check to see if this directory exists. If it doesn't, it will create it for you. (The directory would already exist if you had previously loaded the software and were now loading an update, or if you created it yourself from the CLI.) If the directory does already exist, then when the SMI loads the files off the release media, it will delete the files already existing in the directory and load the new ones.

The last prompt allows you to specify a subset of the files that came with the software release. You will in most cases want to load everything on the media. Unless you have a specific reason for not doing so, accept the default # template.

Files: (Specify filenames and/or templates.)
⌡

If you are installing from diskettes, you will then receive the following prompt and default answer.

Fileset name:
@LFD:VOL1:

Find the section in your Release Notice for loading from diskette. (Remember, this prompt applies to diskette users only.) Then find the line that starts with LOAD/V @LFD:... The fileset name is the pathname beginning with @LFD. The default response is partial — @LFD:VOL1: — you must append the rest of the pathname. (If the volume number shown in your Release Notice is not VOL1, you can type over the default response with the correct one. Note, however, that your pathname *must* begin with @LFD.) For example, continuing with our FORTRAN 77 example, suppose the LOAD line in the Release Notice reads like this:

LOAD/V @LFD:VOL1:F77 # <NEW LINE>

You would answer your prompt for fileset name as follows:

Fileset name:
@LFD:VOL1:F77 ⌡

(Note that the # template in the LOAD line of the Release Notice indicates which files to load. You already specified this at the "Files:" prompt.)

You will then receive a prompt to press NEW LINE when the diskette or tape is mounted. SMI will then load files from the diskette or tape into the directory you specified, displaying a list of the filenames loaded. When it is ready for the next diskette (if applicable), it will prompt you.

When the software installation is complete, you will be prompted to remove the media from the drive. When you have removed your tape or diskette, press NEW LINE. You will return to the Customize the System Menu.

(If you need information on handling, storing, inserting, or removing tapes or diskettes, see Chapter 4.)

Changing the System Date or Time (DATE)

You can use option "3 Change the system date or time" on the Customize the System Menu, or the keyword DATE, to change the system date or time. This option works the

same way as option 3 on the Starter Main Menu. Refer to the section "Changing the System Date and Time" in the "Starter Menu Options" section of Chapter 2 for details on changing the system date or time. When you have finished entering a new date and time, you will return to the Customize the System Menu.

Specifying the Pathname of the Default System (SYSTEM)

You have a default system that you received when you purchased your computer with AOS/VS. This is the system that you are running when you first power up, and it will probably be sufficient for you to run all the time.

However, with AOS/VS, you can also run a program called VSGEN, which we describe in the *How to Generate and Run AOS/VS* manual. With VSGEN you can define a different system than the default. If you choose to do so, you can specify that the system you generated (or *genned*) will be the system that comes up every time you start up, rather than the original default system. To do this, select option "4 Specify the pathname of the default system" on the Customize the System Menu, or specify the SYSTEM keyword. The system will then prompt you to enter the system's pathname. Enter the pathname you gave the system when you ran VSGEN to create it. If you enter a system name that does not exist, you will receive an error message.

The SMI will return you to the Customize the System Menu. For subsequent powerups, the system you specified will be the default.

Editing the UP Macro (UPCLI)

The UP macro (UP.CLI) runs every time you bring your system up. It performs tasks such as bringing up the multiuser environment, enabling consoles, and starting up the network, INFOS® II, and CEO. The UP macro that comes with your system is adequate for your first time powerup, and possibly for all future powerups. It includes calls to the macros that bring up the network, INFOS II, and CEO, so that if you have this software loaded on your system, it will be brought up. If you don't have this software, it doesn't matter.

NOTE: While we provide a method to edit the UP.CLI macro from the SMI, we do not do so for the UP_EXEC.CLI macro. This is because we strongly recommend that you do *not* edit the UP_EXEC.CLI macro. If you did, you could make a mistake that could cause the system to hang on powerup. The UP_EXEC.CLI macro should be sufficient for your needs as provided.

Note that the UP.NETWORK.CLI macro that comes with XODIAC must be edited before it will actually execute and be accurate for your network configuration. (Refer to your XODIAC documentation for instructions.) The UP macro expects the UP.NETWORK.CLI macro to be in the root directory (:) or in :NET:UTIL.

Similarly, if you are a CEO user, you might need to edit your UP.CEO.CLI macro (located in :UTIL:CEO_DIR) for your particular system, or you might want to add more instructions to the UP macro. For example, the UP macro starts the queues LPT, BATCH_LIST, and BATCH_OUTPUT to the default printer, but it does not start up any queues for letter-quality printers. It also does not enable logging, which some CEO users want. See your CEO documentation to find out if you will need to make any corrections to either macro.

It is important for the UP macro to bring up these software products in the correct order; that is, first the network, and then INFOS II, and finally, CEO. While it is not required, we have enabled consoles in the UP macro *after* bringing up the network, INFOS II, and

CEO. Otherwise, users might log on and attempt to use CEO, for example, before it is running.

For more information, refer to the appropriate documentation for each software product you have loaded.

The UP macro automatically creates a *log file*, which shows what is happening while the UP macro executes. The file, called UP.LOG, is located in the root directory. If you have any problems during the system startup, you can type this file to see what actually occurred. In any case, it is a good idea, once AOS/VS has started up, to list all running processes (SMI keyword WHOS) and be sure all the products you brought up in the UP macro are actually running.

If your system comes up without any problems, you might want to disable logging for future startups, to save the disk space used by the log file. Wait until your next time starting up the system, and then select option "5 Edit the UP macro" on the Customize the System Menu (keyword UPCLI). Find the following lines in the UP macro, somewhere around line 20.

```
DELETE/2=IGNORE   :UP.LOG.BU
RENAME/2=IGNORE   :UP.LOG<,.BU>
LOGFILE   :UP.LOG
TRACE/COMMAND/MACRO/LOG
```

(These lines instruct the system to change any existing log file named UP.LOG into a backup file named UP.LOG.BU, to create a new log file named UP.LOG, and to enable logging to the new file.)

To disable logging, *do not* delete these lines. Rather, you can make them inexecutable by changing the [!EQUAL,1,1] statement that precedes them to read [!EQUAL,1,2] instead. You should find this line just before the four lines listed above. Later, if you want to re-enable logging at startup, change the statement back to [!EQUAL,1,1].

When you are ready to edit the UP macro, select option 5 from the Customize the System Menu. Or you can issue the UPCLI keyword. You will use the SED text editor to modify the UP macro. If you are not familiar with SED, be sure to have the *SED Text Editor User's Manual (AOS and AOS/VS)* nearby. (SMI will display a message to this effect when you select option 5, before putting you in SED.)

The UP macro is split into two sections. The first section does not appear when you select option "5 Edit the UP macro." This helps prevent you from making mistakes that might prevent the system from coming up. It cannot, however, ensure that you won't do so. Use care when editing the UP macro. Determine in advance what you want to add to, delete from, or change in the UP macro; you will be less likely to make mistakes. Note that your UP macro cannot contain !READ pseudomacros (see your CLI manual for details on !READ).

When you exit from SED (enter BYE on the command line), you will return to the Customize the System Menu.

If you want to use a text editor other than SED to edit the UP macro, you will have to do so from the CLI, or use option "1 Run a program or application" on the SMI Main Menu and enter the appropriate command line.

Editing the DOWN Macro (DOWNCLI)

Running the DOWN macro is a regular part of shutting down your system. (We describe system shutdown in detail, later in this chapter.) The DOWN macro brings down CEO, INFOS II, and the network. Note that it does not disable consoles from logging on; in the section of this chapter that deals with system shutdown we recommend that you disable consoles before you execute the DOWN macro.

Be sure to refer to the documentation for CEO, INFOS II, and XODIAC to see if you must add anything to the DOWN macro. Note that CEO, INFOS II, and the network are brought down in the opposite order from which they were brought up. That is, CEO is brought down first, and then INFOS II, and finally, the network.

To edit the DOWN macro from the Customize the System Menu, select option "6 Edit the DOWN macro" or issue the keyword DOWNCLI. You will use the SED text editor. If you are not familiar with SED, be sure to have your *SED Text Editor User's Manual (AOS and AOS/VS)* at hand. (SMI will display a message to this effect when you select option 6, before putting you in SED.) Know in advance what you want to add to or delete from the DOWN macro before you begin; you will be less likely to make mistakes. When you exit from the SED text editor (enter BYE on the command line), you will return to the Customize the System Menu.

If you want to use a text editor other than SED to edit the DOWN macro, you will have to do so from the CLI, or use option "1 Run a program or application" on the SMI Main Menu, and enter the appropriate command line.

Editing the System Log-on Message (LOGON)

The system log-on message is a text file that prints out on all users' screens at logon. This file might contain information such as the name of the system manager, the time the system will be coming down, or other work-related items. To modify your system's log-on message, select option "7 Edit the system log-on message" on the Customize the System Menu. Or specify the LOGON keyword from any SMI menu.

The system will place you in the SED text editor to edit the system log-on message. Therefore, be sure you have the *SED Text Editor User's Manual (AOS and AOS/VS)* handy if you aren't familiar with SED. (The system will display a message to this effect when you select option 7, before putting you in SED.)
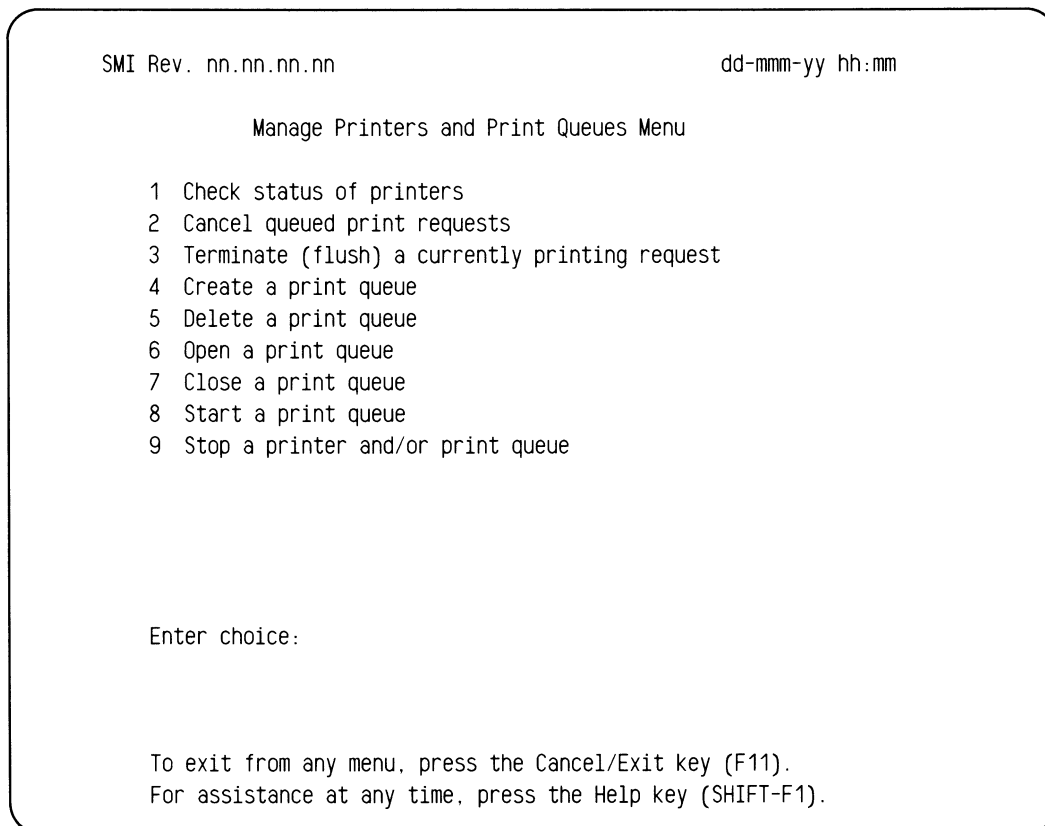
Note that the system log-on message is different from the user's initial IPC file. The IPC file can differ from user to user, especially if each user has an IPC file in his or her own directory, and it can perform a number of tasks. The system log-on message, however, will be the same for each user that logs on to the system, and all it does is write information out to the screen.

Editing the System SETUP Macro (SETUP)

The system setup macro (SETUP.CLI) is a small set of instructions that executes when the system comes up. It contains items such as setting the default access control list (ACL) for all files created, and the default search list. (The ACLs determine which users have which access privileges to a particular file.) To edit this macro, you will use the SED text editor. When you select option "8 Edit the system SETUP macro" on the Customize the System Menu, or specify the SETUP keyword, the system will display a message telling you that the system will place you in SED if you continue. If you aren't familiar with SED, be sure you have the *SED Text Editor User's Manual (AOS and AOS/VS)* handy before you proceed.

Managing Printers and Print Queues (PQUEUES)

Option "4 Manage printers and print queues" on the Administrative Functions Menu allows you to perform printer functions not available to regular system users. When you select this option, the Manage Printers and Print Queues Menu will appear on your screen, as shown in Figure 3-15. Issuing the keyword PQUEUES from any SMI menu will also bring up this menu.

```
SMI Rev. nn.nn.nn.nn                          dd-mmm-yy hh:mm

                  Manage Printers and Print Queues Menu

         1  Check status of printers
         2  Cancel queued print requests
         3  Terminate (flush) a currently printing request
         4  Create a print queue
         5  Delete a print queue
         6  Open a print queue
         7  Close a print queue
         8  Start a print queue
         9  Stop a printer and/or print queue




         Enter choice:



         To exit from any menu, press the Cancel/Exit key (F11).
         For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-15. Manage Printers and Print Queues Menu

Checking the Status of Printers (PSTATUS)

When you select option "1 Check status of printers" on the Manage Printers and Print Queues Menu, or specify the PSTATUS keyword, you receive a display of information about your system's printers and the print queues associated with them. The display lists printer information by device name; for example, @PRINTER1.

The status listing displays the queues associated with each printer, as well as default form specifications, such as lines per page (LPP) and characters per line (CPL). If you have several printers, the display can take up more than one screen.

After all status has displayed, you can return to the Manage Printers and Print Queues Menu by pressing NEW LINE.

For example, suppose you have printers PRINTER1 and PRINTER2 on your system. If you select option 1, your display might look like the following:

```
@PRINTER1 processing:  BATCH_OUTPUT, BATCH_LIST, LPT
CPL = 250, LPP = 60, Headers = 1, Trailers = 0
Even pagination enabled, Binary mode disabled
Bias factor = 0, Process type = Swappable, Priority = 1


@PRINTER2 processing:  LQP
CPL = 80, LPP = 63, Headers = 0, Trailers = 0
Even pagination disabled, Binary mode enabled
Bias factor = 0, Process type = Swappable, Priority = 2
```

For information on any of the other statistics, refer to the sections on process types, priority, and the EXEC XBIAS and SPOOLSTATUS commands in *How to Generate and Run AOS/VS*.

Canceling Queued Print Requests (PCANCEL)

Option "2 Cancel queued print requests" on the Manage Printers and Print Queues Menu lets you cancel (or remove from the print queue) a request. PCANCEL is the keyword for this option. Canceling a request differs from terminating a request in that you *cancel* a job that has not yet started, whereas you *terminate* or *flush* a job that is currently printing. Terminating a print request is option 3 on the Manage Printers and Print Queues Menu. Both of these options allow you to remove requests made by any user on the system, unlike the CANCEL request on the Control Printers Menu, which allows you to cancel only requests you have made.

When you select option "2 Cancel queued print requests," the system will display the print queue(s) and prompt you for the sequence number of each request that you want canceled. You can cancel any queued requests (up to 10), as long as they are not yet active. If a request is marked with an asterisk on the queue display (which indicates that it is currently printing), then you cannot cancel it.

After you indicate which queued job(s) to remove, the SMI will return you to the Manage Printers and Print Queues Menu.

Terminating (Flushing) an Active Print Request (PFLUSH)

You can use option "3 Terminate (flush) a currently printing request" on the Manage Printers and Print Queues Menu (or the PFLUSH keyword) to terminate any active print request. To remove a request from the queue before it becomes active, use option "2 Cancel queued print requests" on the Manage Printers and Print Queues Menu, described previously.

When you select option "3 Terminate (flush) a currently printing request," the system will prompt you to specify the printer that is processing the request you want to terminate. It will then display the status of the printer and prompt you to confirm that the displayed printer request is the one you want terminated. If it is, enter Y; otherwise, enter N. You will then return to the Manage Printers and Print Queues Menu.

Creating a Print Queue (PCREATE)

To create a new print queue, you must decide

- What you will name the queue.

- Which printer(s) the queue will be associated with.

In general, it is best to stick with standard queue names. Some products, such as CEO, expect queues to have the standard names, so to get print requests sent to the correct printer, you must name them appropriately. The standard queue names follow:

Printer Type	Queue Name	Additional Queue Names
Line printer or default printer	LPT	LPT1, LPT2, etc.
Letter-quality printer	LQP	LQP1, LQP2, etc.
Laser printer	LPE	LPE1, LPE2, etc.

For example, if you have one line printer and two letter-quality printers on your system, and want one queue associated with each, your queue names would be LPT, LQP, and LQP1. Queues for output from batch jobs are generally called BATCH_LIST and BATCH_OUTPUT.

NOTE: When you use the SMI option to configure your system, you can define a parallel (line printer type) printer, and printers on console lines. When doing so, you can specify one of your printers to be the default printer. If you do so, the SMI automatically starts the queues LPT, BATCH_LIST, and BATCH_OUTPUT and associates them with the default printer.

When you choose option "4 Create a print queue," the system will prompt you to enter the queue name and which printer(s) you want to associate the queue with. Once you have entered this information, you can press NEW LINE to return to the Manage Printers and Print Queues Menu. The keyword for this option is PCREATE.

For example, suppose you want to create a new queue for your letter-quality printer, PRINTER2. You already have one queue going to PRINTER2, called LQP, so you want to call the new queue LQP1. You would respond to the prompts as follows:

Queue name: LQP1)

Printer(s): PRINTER2)

Note that you must already have used the Configure the System Menu to define the printer(s) you name at the "Printer(s)" prompt.

When you have answered both prompts, you will return to the Manage Printers and Print Queues Menu. If you specify a queue name that already belongs to a print queue, you will receive the message *Queue already exists*. If you specify a name for which there is already a file of some other type in the :PER directory (such as a text file or directory), you will receive the message *File name already exists*. In either case, you will have to specify a different name for the queue.

When you create a new queue, the SMI also opens and starts the queue and continues its associated printer(s) so the queue will be ready for use immediately.

NOTE: Although you can use CEO to create queues, you must use the SMI (or the CLI) to open and start the queues and continue the printers. Unlike SMI, CEO does not perform these functions for you when you create a queue.

Deleting a Print Queue (PDELETE)

Option "5 Delete a print queue" on the Manage Printers and Print Queues Menu lets you delete any print queue that you no longer need. The SMI first closes the queue before deleting it, so users cannot queue any more requests to it. PDELETE is the keyword for this option.

NOTE: Be sure there are no requests left in the queue before you delete it. Deleting a print queue discards all requests in the queue.

Use option "1 Check status of printers" before you choose to delete any queue. If you specify to delete a queue that does not exist, you will not receive an error message, but no harm will be done. If you specify to delete a queue that is not a print queue, you will receive the message *Queue is not a print queue.*

When you select option "5 Delete a print queue," the system will prompt you to enter the queue name. Type it and press NEW LINE. The system will remind you that deleting a queue discards its contents, and will prompt you to confirm your selection. Enter Y or N. You will then return to the Manage Printers and Print Queues Menu.

Opening a Print Queue (POPEN)

You can open any print queue you have closed by selecting option "6 Open a print queue" on the Manage Printers and Print Queues Menu, or by specifying the POPEN keyword. Opening a queue allows users to queue requests to it. Note that if you create a queue with option "4 Create a print queue" (described earlier) it will be opened automatically. You need only use option "6 Open a print queue" on queues that you have closed by using option "7 Close a print queue."

When you select option "6 Open a print queue," you will receive a prompt for a queue name. Type the name of the queue you want to open and press NEW LINE. You will return to the Manage Printers and Print Queues Menu.

If you specify a queue name that does not exist, you will receive the message *Queue does not exist.* If the queue you specify is not a print type queue, the message will be *Queue is not a print queue.* If you specify a queue that is already open, no harm will be done; you will receive the message *Queue is already open.*

See the example under "Closing a Print Queue," below.

Closing a Print Queue (PCLOSE)

Closing a print queue prevents users from placing any more requests in it. When you select option "7 Close a print queue" on the Manage Printers and Print Queues Menu, or specify the PCLOSE keyword, the system will prompt you to enter a queue name. Type the name of the queue you want to close and press NEW LINE. You will return to the Manage Printers and Print Queues Menu. Subsequently, you can reopen the queue with option "6 Open a print queue."

If you attempt to close a queue that doesn't exist, you will receive a *Queue does not exist* message. If you specify a queue that is not a print queue, the message *Queue is not a print queue* will appear. If you specify a queue that is already closed, you will receive the message *Queue is not open.*

For example, suppose your system has a letter-quality printer, and one queue associated with the printer, named LQP. The printer needs a new ribbon and you won't be getting a new one until the next day, so you want to close the queue to the printer to prevent it from filling up with requests that can't yet be processed. From the Manage Printers and Print Queues Menu, select option "7 Close a print queue," as follows:

Enter choice: 7 ⌋

You will receive the Close a Print Queue screen, with some introductory text and a prompt for the queue name. Type LQP and press NEW LINE, as follows:

Queue name: LQP ⌋

The Manage Printers and Print Queues Menu will reappear. The next day, when the new ribbon is on the printer, you will want to reopen the LQP queue. From the Manage Printers and Print Queues Menu, select option "6 Open a print queue":

Enter choice: 6 ⌋

You will receive the Open a Print Queue screen, again with some introductory text and a prompt for queue name. Type LQP and press NEW LINE, as follows:

Queue name: LQP ⌋

The LQP queue will now be open again for users' print requests.

Starting a Print Queue (PSTART)

Option "8 Start a print queue" on the Manage Printer and Print Queues Menu (keyword PSTART) lets you associate an existing queue with a certain printer (or printers). This option also continues each specified printer so it is ready to accept requests from the queue.

Note that if the queue is not open, users will not be able to send requests to it. If a queue is started, it will process requests already in the queue; the queue must be open, however, for any additional requests to be queued to it.

NOTE: When you power up your system, the queues LPT, BATCH_OUTPUT, and BATCH_LIST are opened and started to the default printer via the UP macro. If you want other queues started, however, you must either add the CONTROL @EXEC START queuename command to the UP macro (where "queuename" is the name you gave the queue when you created it), or come to the Manage Printers and Print Queues Menu and start the queue via option "8 Start a print queue."

When you select option "8 Start a print queue," the SMI will prompt you for a queue name and the printer(s) that you want the queue associated with. If you specify a queue whose name does not exist in the :PER directory, you will receive a *Queue does not exist* message. If the name you specify is a queue, but not a print queue, you will receive the message *Queue is not a print queue.*

For example, you might have a print queue called LQP that sends requests to a letter-quality printer. If you added another letter-quality printer to your system, you might want to have the same queue feed requests to it so that requests would all be handled in first-in first-out order. (If you had separate queues for the two printers, someone might send a request to one queue, where it might wait behind a lengthy job; meanwhile, the job on the other queue might have finished, leaving the printer available and idle.) To use the existing queue for the new printer, you would need to associate the LQP queue with the new printer.

In this example, you might first check to be sure the queue is open, by selecting option "2 Display contents of print queues" on the Control Printers Menu (keyword DISPLAY). The queue name should have the words "PRINT Open" next to it. If it doesn't, then open the queue by selecting option "6 Open a print queue" on the Manage Printers and Print Queues Menu (keyword POPEN).

Once the queue is open, select option "8 Start a print queue" on the Manage Printer and Print Queues Menu by typing 8 and pressing NEW LINE:

Enter choice: 8 ⏎

You would then see the Start a Print Queue screen, consisting of some introductory text and prompts for queue name and printer(s). If you called the new printer PRINTER2 on the Specify System Configuration screens, you would enter the following:

Queue name: LQP ⏎

Printer(s): PRINTER2 ⏎

You would then return to the Manage Printers and Print Queues Menu. The LQP queue would begin distributing printing requests to both your original printer and to the new printer, sending the next queued request to whichever printer became available first.

Stopping a Printer and/or Print Queue (PSTOP)

You can use option "9 Stop a printer and/or print queue" to dissociate a queue from a printer, or stop a printer, or do both. When you select option 9 or the PSTOP keyword, you will receive prompts for both queue name and printer. You won't answer both prompts in all cases. Table 3-3 describes what to enter at the prompts, depending on what you want to do.

Table 3-3. Answering Prompts to Stop a Printer and/or Print Queue

If you want to	At the "Queue name:" prompt	At the "Printer:" prompt
Stop a printer.	Press NEW LINE.	Enter the printer name.
Dissociate a queue from *all* printers it is associated with.	Enter the queue name.	Press NEW LINE.
Dissociate a queue from one printer.	Enter the queue name.	Enter the printer name.

Note that stopping a print queue does not close the queue. If you want the queue closed, so users can no longer queue requests to it, you must close it via option "7 Close a print queue."

If the name you specify for the queue is not an existing queue name, you will receive the error *Queue does not exist.* If the name belongs to a queue, but not a print queue, you will receive the message *Queue is not a print queue.* In either case, you can enter a different name, or press Cancel/Exit to exit from the Stop a Printer and/or Print Queue screen.

For example, suppose we continue the example we began in the "Starting a Print Queue" section, above. Let's say the second printer we added, PRINTER2, is in user Dale's office and Dale has an important all-day meeting going on. We don't want users going into Dale's office to pick up printouts during the meeting; therefore, we no longer want PRINTER2 to be associated with any print queues, because many users are sending requests to the queues and PRINTER2 is no longer available to them. We don't want to close the queue, however, or we won't be able to send requests to PRINTER1. From the Manage Printers and Print Queues Menu, we select option "9 Stop a printer and/or print queue," as follows:

Enter choice: 9)

We then receive some introductory text on the Stop a Printer and/or Print Queue screen, and the prompts for queue name and printer. We answer the prompts in the following way:

Queue name:)

Printer: PRINTER2)

The Manage Printers and Print Queues Menu will reappear, and PRINTER2 will have been dissociated from the LQP print queue (and any others it may have been associated with).

NOTE: If you use the PSTOP keyword to select this option, you cannot enter any arguments to the PSTOP keyword command. When you enter PSTOP at any SMI menu, the Stop a Printer and/or Print Queue screen will come up.

Controlling Printer Forms (FORMS)

A printer form is a special format to use for printing requests. You can define different forms by using the Forms Control Utility (FCU). This utility is described in the manuals *How to Generate and Run AOS/VS* and the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)*, and more extensively in CEO documentation, if you are a CEO user.

Option "5 Control printer forms" on the Administrative Functions Menu allows you to set or change printer forms. When you select 5, the Control Printer Forms Menu will appear on your screen, as shown in Figure 3-16. You can also get this menu by specifying the FORMS keyword from any SMI menu.

```
┌─────────────────────────────────────────────────────────────────┐
│  SMI Rev. nn.nn.nn.nn                        dd-mmm-yy hh:mm      │
│                                                                  │
│                    Control Printer Forms Menu                    │
│                                                              │   │
│     1  Display contents of print queues                      │   │
│     2  Display status of printers with form names            │   │
│     3  Switch to special form                                    │
│     4  Restore the default form                                  │
│     5  Change the default form                                   │
│     6  Change the number of lines printed per page               │
│     7  Change the number of characters printed per line          │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│     Enter choice:                                                │
│                                                                  │
│                                                                  │
│                                                                  │
│     To exit from any menu, press the Cancel/Exit key (F11).      │
│     For assistance at any time, press the Help key (SHIFT-F1).   │
└─────────────────────────────────────────────────────────────────┘
```

Figure 3-16. Control Printer Forms Menu

To return to the Administrative Functions Menu, press the Cancel/Exit function key (F11).

Displaying the Contents of Print Queues (PDISPLAY)

Option "1 Display contents of print queues" on the Control Printer Forms Menu lets you check the print queue contents before you perform any other printer form functions. The keyword for this option is PDISPLAY. It's a good idea to use this option before choosing any other option on this menu, in case other users have queued requests. You wouldn't want to change the default form on a printer to CHECKS, for example, if another user was attempting to print out a business letter or technical report on that printer.

Option "1 Display contents of print queues" also allows you to be certain the queue you want to use is open. If its status shows as "Closed," you will have to go to the Manage Printers and Print Queues Menu to open the queue.

When you select this option, a listing of the print queues and the queued requests will display on your screen. If the list is too long to fit on one screen, your terminal will be placed in Page mode. This means one screen will print out, then the screen will freeze. To continue the display, type the CTRL-Q sequence. When the full listing has displayed, the system will prompt you to press NEW LINE to return to the Control Printer Forms Menu.

Displaying the Status of Printers with Form Names (PSTATUS)

Option 2 on the Control Printer Forms Menu lets you display the status of the printers and print queues. The status also shows the form name if special forms are in effect. The display lists printer information by device name; for example, @PRINTER1. The keyword for this option is PSTATUS.

The status listing displays the queues associated with each printer, as well as form specifications, such as lines per page (LPP) and characters per line (CPL). If you have several printers, the display can take up more than one screen. If this happens, you can freeze the display by typing the CTRL-S sequence. To resume scrolling, type CTRL-Q.

After all status information has displayed, you can return to the Control Printer Forms Menu by pressing NEW LINE.

For example, suppose you have printers PRINT1 and PRINT2 on your system. If you select option 1, your display might look like the following:

```
@PRINT1 processing:  BATCH__OUTPUT, BATCH__LIST, LPT
CPL = 250, LPP = 60, Headers = 1, Trailers = 0
Even pagination enabled, Binary mode disabled
Bias factor = 0, Process type = Swappable, Priority=2
Default forms on @PRINT1, SHORT.WIDE


@PRINT2 processing:  LQP
CPL = 80, LPP = 63, Headers = 0, Trailers = 0
Even pagination disabled, Binary mode enabled
Bias factor = 0, Process type = Swappable, Priority=1
Default forms on @PRINT2, LETTER
```

For information on any of the other statistics, refer to the sections on process types, priority, and the EXEC XBIAS and SPOOLSTATUS commands in *How to Generate and Run AOS/VS*.

Switching to a Special Form (SPECIAL)

Use the special forms option (3 on the Control Printer Forms Menu or keyword SPECIAL) to specify that you want to change the type of form for the print request(s) you are going to do. There are several steps you must follow in order to use special forms.

1.   Find the paper forms that you will need for your special forms print request.

2.   Use the Forms Control Utility (FCU) to create the form specification if it does not already exist.

3.   Queue your print request from the Control Printers Menu (or from the CLI or CEO). *Be sure to specify the form name on the print request.* If you use the Control Printers Menu or the QPRINT keyword, you will be prompted for the form name. If you are using the CLI, the print request will consist of the QPRINT command with the /FORMS= switch (see your CLI manual for details).

4.   If you aren't already running the SMI program, execute it (X SMI) from the CLI). Get to the Control Printer Forms Menu (keyword FORMS).

5.   Select option "3 Switch to special form." This instructs the system that you are going to use a special form so it will be able to process your print request. The system will prompt you for a form and printer name.

6. Enter the name of the form you specified on your print request, and the printer you want to use the form on. The system will pause the printer and prompt you to go change the paper.

7. Go to the printer and change the paper to the type necessary for your special form. (If another job is printing, wait until it finishes.)

8. Return to the screen and press NEW LINE, as prompted. The system will instruct the printer to continue processing requests.

9. After your print job has finished, select option "4 Restore the default form" on the Control Printer Forms Menu. The system will prompt you for the name of the printer on which you want to restore the form.

10. Enter the printer's name. The system will instruct you to go change the printer paper back to the regular type.

11. Change the paper on the printer back to the default type. Then return to your terminal and press NEW LINE.

NOTE: Restoring the default form after using special forms is very important. If you fail to do so, the system will not process other users' print requests.

For example, suppose user Lee is in charge of Payroll. Every Thursday, Lee selects the special form CHECKS and runs all the paychecks through the LQP queue to print on PRINTER3. Here are the steps Lee would follow:

1. From the Control Printers Menu, select option "1 Print files" to queue the print request.

   Enter choice: 1 ⏎

2. At the Print Files screen, enter the appropriate information.

```
                              Print Files


           .

           .

           .


      Pathname(s):   :UDD:SYSMGR:PAYCHECKS ⏎

      Queue   name:   LQP ⏎

      Form   name:   CHECKS ⏎
```

3. The Control Printers Menu reappears. Specify the keyword FORMS to get to the Control Printer Forms Menu.

   Enter choice: FORMS ⅃

4. Select option "3 Switch to special form" on the Control Printer Forms Menu to switch the printer to the special form. Type the form name and the printer name at the prompts.

   Form: CHECKS ⅃

   Printer: PRINTER3 ⅃

5. Go to PRINTER3 and change the paper to check blanks. Then return to the screen and press NEW LINE.

6. When the checks have all printed, select option "4 Restore Default Forms" (see the next section for details). Type the printer name when prompted.

7. Change the paper back to the regular type.

8. Return to the terminal screen and press NEW LINE.

Restoring the Default Form (RDEFAULT)

Use option "4 Restore the default form" on the Control Printer Forms Menu to restore the default form on the printer after you have used a special form (option 3, above). When you select option 4, the SMI will display the Restore the Default Form screen, at which you are prompted to enter the printer name on which you want the default form restored. Type the name and press NEW LINE. You will return to the Control Printer Forms Menu. The keyword for this option is RDEFAULT.

In our example above with user Lee in Payroll, after the checks were printed and Lee had selected option "4 Restore the default form" on the Control Printer Forms Menu (step 9 of the example), Lee would enter the following in response to the prompt for printer name:

Printer: PRINTER3 ⅃

Now the system would prompt Lee to go change the paper on the printer, and then to return to the screen and press NEW LINE. Once Lee did so, other users' requests would be processed on the printer, using the standard form for that printer.

Changing the Default Printer Form (CDEFAULT)

Option "5 Change the default form" on the Control Printer Forms Menu allows you to change the name of the form that normally prints on a printer. Before you attempt to use this option, be sure you know the name of the form you want for the new default. The Forms Control Utility stores all form specifications in the directory :UTIL:FORMS.

Once you select option 5, or specify the CDEFAULT keyword, the system will display the Change the Default Form screen, which prompts you to enter the form name and the printer on which you want to change the default form. Enter the correct information. The system will then prompt you to go to the printer and change the paper. Once you've done so, press NEW LINE at the prompt and you will return to the Control Printer Forms Menu.

For example, suppose Lee in Payroll now has PRINTER3 to be used almost exclusively for printing checks. Lee wants the default form for that printer to be CHECKS, so it won't need to be changed all the time. From the Control Printer Forms Menu, Lee would select option "5 Change the default form," and enter the following at the prompts on the Change the Default Form screen:

Form: CHECKS ⏎

Printer: PRINTER3 ⏎

The system would then instruct Lee to go change the printer paper, and to return to the screen and press NEW LINE. Once Lee did so, the new default form would be ready to use.

Changing the Number of Lines Printed Per Page (LPP)

Option "6 Change the number of lines printed per page" on the Control Printer Forms Menu (keyword LPP) allows you to make the text on printed pages shorter or longer. You can use this option in conjunction with option "7 Change the number of characters printed per line" to change the whole page format. Note that these options do not affect special forms; they apply only when you queue requests to print without a special form.

When you select option 6, you will receive the Change the Number of Lines Printed Per Page screen, which prompts you to enter the number of lines you want, and the printer on which to change the value. The allowable range of values for lines per page is 6 - 144. For example, suppose you want to set PRINTER2 to print 55 lines per page. You would answer the prompts in the following way:

Number of lines: 55 ⏎

Printer: PRINTER2 ⏎

After you have entered your answers, you will return to the Control Printer Forms Menu. The new number of lines per page will be in effect. Note that once you've changed the number of lines per page, the default printer form is no longer in effect. To reset it, select option "5 Change the default form" and specify the appropriate form name.

Changing the Number of Characters Printed Per Line (CPL)

You can adjust the line length of a printed page by selecting option "7 Change the number of characters printed per line" on the Control Printer Forms Menu. When you select option 7, or specify the CPL keyword, you will receive a screen that prompts you to enter the number of characters and the printer on which you want to change this value. The range of acceptable values is 16 - 255. Enter the number that specifies the maximum number of characters that you want printed on each line.

For example, suppose you want to print a document with a wide right margin so that its reviewers can mark comments there. You might want to set the maximum number of characters to print per line to 50 (instead of the normal 72 to 80). The printer you will be using is PRINTER1. You would respond to the prompts on the Change the Number of Characters Printed Per Line screen as follows:

Number of characters: 50 ⏎

Printer: PRINTER1 ⏎

After you have entered the values, you will return to the Control Printer Forms Menu.

Note that you don't need to use this option (or change the number of lines per page) when you switch to a special form. Each form has its own values defined for characters per line and lines per page. Using this option to change the number of characters per line does, however, mean that the default printer form is no longer in effect. To reset the default printer form, select option "5 Change the default form" and specify the appropriate form name.

Managing the Batch Queue (BATCH)

The batch queue allows you to send requests that don't need human interaction to the processor. For example, suppose you want to run a program that has a disk file as input, and you don't want your terminal to be tied up waiting for the program to finish. You can send the job to the batch input queue. In batch, the requests process in a continuous, autonomous stream. The batch input queue is like a file that holds the batch requests. It then assigns each request to a batch stream. When a batch job is finished, its output goes to a batch output queue.

Managing the batch queue is option 7 on the Administrative Functions Menu. When you select it, you will receive the Manage Batch Queue Menu shown in Figure 3-17. The keyword for this menu is BATCH.

```
SMI Rev. nn.nn.nn.nn                          dd-mmm-yy hh:mm

                      Manage Batch Queue Menu

        1  Display contents of batch queue
        2  Display status of batch streams
        3  Cancel a queued batch request
        4  Terminate (flush) a currently running request
        5  Pause a batch stream
        6  Continue a batch stream




        Enter choice:



        To exit from any menu, press the Cancel/Exit key (F11).
        For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 3-17. Manage Batch Queue Menu

To return to the Administrative Functions Menu, press the Cancel/Exit key, F11.

Displaying the Contents of the Batch Queue (BDISPLAY)

Option "1 Display contents of batch queue" on the Manage Batch Queue Menu allows you to see what jobs are waiting in the batch input queue. You might want to do this to check to see if your batch job is running, or is finished, or to see where in the queue a job lies. When you select option 1, or specify the BDISPLAY keyword, the system will display the contents of the batch input queue. For example, your screen might look something like the following:

```
BATCH_INPUT    BATCH    Open
    342 A    SYSMGR    :SYSMGR:USERS:SORT_LIST
*   347      DALE      :MACROS:DAILY_SWEEP
    348      CHRIS     :UDD1:CHRIS:BACKUP

Flags explanation:
A = Unexpired /AFTER
* = Active
```

This example shows that user SYSMGR queued a batch request called SORT_LIST to be processed after a specified time interval. Dale's batch job is currently processing, and Chris's request is awaiting processing.

If your batch queue contents take up more than one screen, the system will freeze the screen once it is full. To scroll the screen up, use the CTRL-Q sequence. When all contents have been displayed, you can press NEW LINE to return to the Manage Batch Queue Menu.

Displaying the Status of Batch Streams (BSTATUS)

When you send a request to the batch input queue, the queue assigns the request to a batch stream. Option "2 Display status of batch streams" on the Manage Batch Queue Menu (keyword BSTATUS) lets you see the status of each batch stream. Note that batch streams are named by appending an underscore and a number to the batch input queue name. If you select option 2, your screen might look something like the following:

BATCH_INPUT_1 [Idle] Paused
Bias factor = 0, Process type = Swappable, Priority = 3

BATCH_INPUT_2 [Idle]
Bias factor = 0, Process type = Swappable, Priority = 3

This sample display tells you that streams BATCH_INPUT_1 and BATCH_INPUT_2 are both *idle*; that is, they aren't running any jobs. BATCH_INPUT_2 is available for use, but BATCH_INPUT_1 is paused. To use BATCH_INPUT_1, you would have to first continue the batch stream.

For information on any of the other statistics, refer to the sections on process types, priority, and the EXEC XBIAS and STATUS commands in *How to Generate and Run AOS/VS*.

After the batch stream status is displayed, you can return to the Manage Batch Queue Menu by pressing NEW LINE.

Canceling a Queued Batch Request (BCANCEL)

Option "3 Cancel a queued batch request" on the Manage Batch Queue Menu allows you to remove a queued request that has not yet begun processing. You can remove any inactive request, no matter who queued it. When you enter 3, or use the BCANCEL keyword, the system will display the contents of the batch queue. If the display takes up more than one screen, the system will put your screen in Page mode, which means the screen will freeze once it is full. You can scroll the screen by using the CTRL-Q sequence.

When all queue contents have been displayed, the system will prompt you to enter the sequence number of each request that you want removed from the queue. Enter the number(s) and press NEW LINE. You will then return to the Manage Batch Queue Menu. To ensure that each request you specified was canceled, you can then select option "1 Display contents of batch queue." If the requests are still awaiting processing in the queue, you should see the C flag next to the sequence number of each request you specified, signifying that it was canceled.

Terminating (Flushing) a Currently Running Batch Request (BFLUSH)

Option "4 Terminate (flush) a currently running request" on the Manage Batch Queues Menu lets you terminate an active batch job. When you enter 4, or issue the BFLUSH keyword, the system will display the status of the batch streams. If the display takes up more than one screen, the system will put your screen in Page mode, which means the screen will freeze once it is full. You can scroll the screen by using CTRL-Q.

When the status of each stream has been displayed, the system will prompt you to enter the number of each stream you want to flush. Batch streams are named by appending an underscore and a number to the batch input queue name; the SMI expects you to enter just the number. For example, to flush BATCH_INPUT_2 you would type 2).

Remember that flushing the stream cancels only the request that is currently active. Any queued requests following the active request will begin processing after the active request is flushed. After you enter the number of each stream you want to flush, or press NEW LINE for all streams, the system will return you to the Manage Batch Queue Menu.

Pausing a Batch Stream (BPAUSE)

Option "5 Pause a batch stream" on the Manage Batch Queue Menu lets you suspend batch queue processing by pausing one or more batch streams. When you select option 5, or use the BPAUSE keyword, the status of the batch streams will display, so you can see which are active and which are already paused. The system will then prompt you to enter which batch stream(s) you want to pause. Type each stream's number and press NEW LINE, or press NEW LINE for all. You will return to the Manage Batch Queue Menu. To ensure that the correct streams are paused, you can then select option "2 Display status of batch streams."

For example, suppose you want to pause any batch stream that is not currently processing a request. At the Manage Batch Queue Menu, you would enter 5, as follows, and receive the following screens:

Enter choice: 5 ⟩

BATCH_INPUT_1, Sequence number = 130, Qpriority = 130, User = SYSMGR
PID = 26, Pathname :UDD:SYSMGR:?24.CLI.00001.JOB
Bias factor = 0, Process type = Swappable, Priority = 3

BATCH_INPUT_2 [Idle]
Bias factor = 0, Process type = Swappable, Priority = 3

Specify the number of each batch stream you want to pause, or
press NEW LINE for all: 2 ⟩

You would then receive the Manage Batch Queue Menu on your screen, from which you might select option "2 Display status of batch streams." You would receive the following:

BATCH_INPUT_1, Sequence number = 130, Qpriority = 130, User = SYSMGR
PID = 26, Pathname :UDD:SYSMGR:?24.CLI.00001.JOB
Bias factor = 0, Process type = Swappable, Priority = 3

BATCH_INPUT_2 [Idle] Paused
Bias factor = 0, Process type = Swappable, Priority = 3

This batch stream status verifies that BATCH_INPUT_2 was paused, as requested.

Continuing a Batch Stream

Continuing a batch stream means allowing the stream to continue processing after it has been paused; that is, continuing releases a paused stream. Option "6 Continue a batch stream" on the Manage Batch Queue Menu (keyword BCONTINUE) lets you continue any batch streams that are currently paused. When you select option 6, the system will display the status of the batch streams and prompt you to enter the number of each stream you want continued, or to press NEW LINE for all streams.

For example, suppose you now want to continue the stream you paused in the previous example. You would receive the following status display, and answer the prompt as shown:

BATCH_INPUT_1, Sequence number = 130, Qpriority = 130, User = SYSMGR
PID = 26, Pathname :UDD:SYSMGR:?24.CLI.00001.JOB
Bias factor = 0, Process type = Swappable, Priority = 3

BATCH_INPUT_2 [Idle] Paused
Bias factor = 0, Process type = Swappable, Priority = 3

Specify the number of each paused batch stream that you want to
continue, or press NEW LINE for all: 2 ⟩

You would then return to the Manage Batch Queue Menu, from which you could select option "2 Display status of batch streams" again if you wanted to verify that BATCH_INPUT_2 was continued.

Sending a Command to the Master CLI Process (OPCOMMAND)

Option "7 Send a command to the master CLI process" on the Administrative Functions Menu lets you send a command directly to the master CLI process, which shows up as PID 2 when you display all processes running. This option is available mainly so you can shut down and start up programs such as CEO, INFOS II, and the network without powering down the system.

The keyword for this option is OPCOMMAND.

In Chapter 4, "Backing Up and Restoring Files," we recommend that you have users log off the system and shut down CEO and INFOS II when you are going to perform a system-wide backup, so that the CEO and INFOS II databases will be closed and backed up along with the system-wide user files. To do so, you must issue the proper commands to the master CLI. You can do so using option 7 on the Administrative Functions Menu.

When you select option "7 Send a command to the master CLI process," the system will prompt you to enter a CLI command line. When you enter the command, SMI will send it to the master CLI, which will issue it to the system. (This is necessary because some commands — including those to shut down or start up CEO, INFOS II, and the network — must be issued by the master CLI in order to work.) Once the SMI has sent the command, it will return you to the Administrative Functions Menu.

For example, suppose Robin, the system manager, wants to do a system-wide file backup. The system is running INFOS II, but not CEO, so Robin will only need to shut down INFOS II. After notifying users of the upcoming backup, Robin selects option "7 Send a command to the master CLI process" on the Administrative Functions Menu, and answers the prompt as follows:

Enter a CLI command line:
:INFOS:INFOS_DOWN ↵

Robin would then use the Archive Menu to continue with the backup procedure. We describe file backup in Chapter 4.

After the backup was complete, Robin would return to the Administrative Functions Menu and select option "7 Send a command to the master CLI process" again. At the prompt to enter a CLI command line, Robin would enter the following:

Enter a CLI command line:
:INFOS:INFOS_UP ↵

Robin's screen would then redisplay the Administrative Functions Menu.

Shutting Down the System (SHUTDOWN)

Select option "8 Shut down the system" on the Administrative Functions Menu when you want to bring down AOS/VS on your MV/2000 DC or DS/7000-series system. If you select this option by mistake, don't worry; the system will not shut down immediately. Instead, it will display the Shut Down the System Menu, as shown in Figure 3-18.

You can also get to this menu by entering the keyword SHUTDOWN from any menu in the SMI program.

```
┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│    SMI Rev. nn.nn.nn.nn                       dd-mmm-yy hh:mm      │
│                                                                   │
│                  Shut Down the System Menu                        │
│                                                                   │
│        1 Disable consoles from logging on                         │
│        2 List all processes running                               │
│        3 Send a message to all users                              │
│        4 Terminate active processes                               │
│        5 Execute the DOWN macro                                   │
│        6 Shut down the system                                     │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│        Enter choice:                                              │
│                                                                   │
│                                                                   │
│                                                                   │
│        To exit from any menu, press the Cancel/Exit key (F11).    │
│        For assistance at any time, press the Help key (SHIFT-F1). │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

Figure 3-18. Shut Down the System Menu

To return to the Administrative Functions Menu from this menu, press the Cancel/Exit key (F11).

When you want to shut down the system, it is important that you first make certain that no users are logged on and running programs, such as CEO or a text editor. If you are on a multiuser system, we recommend that you follow these steps for an orderly system shutdown:

1. Select option "1 Disable consoles from logging on" (keyword DISABLE) to ensure that no other users can log on to the system during the shutdown process.

2. Select option "2 List all processes running" (keyword WHOS). The system will display a list of all processes running on the system, as it does when you select the "List all processes running" option on the Manage Consoles Menu or the Archive Menu.

3. If you see that there are active users (that is, any users logged on to the system) other than yourself, then select option "3 Send a message to all users" (keyword BROADCAST). When prompted, type the appropriate message, for example:

    Type the message you want to send to all system users; then press NEW LINE.
    The system is coming down in 5 minutes. Please log off.)

4. After the time interval you specified to your users has passed, select option "2 List all processes running" again to be sure everyone has logged off the system. If you find some users are still active, broadcast another message using option "3 Send a message to all users."

5. Sometimes, users might leave their desks and don't see the messages. In cases like this, you will have to terminate their processes. Select option "4 Terminate active processes" (keyword TERMINATE). As it does on the Manage Consoles Menu, this option will display active processes and ask which you want to terminate. Enter the appropriate PID number(s) (up to a total of 10).

6. As soon as there are no more active users, select option "5 Execute the DOWN macro" (keyword DOWN). The DOWN macro performs some important functions like shutting down CEO, INFOS II, and the network, if you have them running.

7. After the DOWN macro executes, the only active processes remaining should be PMGR, OP, EXEC, one XLPT for each printer, and your own PID(s). Select option "2 List all processes running" to be sure this is the case.

8. Finally, choose option "6 Shut down the system" (keyword SYSDOWN). You will receive an intermediate screen that reminds you not to proceed if there are active users, in case you have forgotten to check. It will ask if you are ready to continue with the shutdown. Type Y (or YES) and press NEW LINE. Your screen will clear and then display the following message:

*** *Starting system shutdown* ***

Once the system has shut down, you will see this message on the system console:

System shutdown

Please turn off power.

9. Turn off your system's power. Your shutdown is complete. (See the following NOTE for an alternative to turning off power.)

NOTE: Although the screen instructs you to turn off power to your system, this is not required. If you do not want to power your system down every time you shut down AOS/VS, and you don't mind using the SCP CLI for a couple of commands, then you can follow these steps instead of turning power on and off.

   a. Enter the break sequence (CMD-BREAK or just BRK or BREAK for keyboards that don't have a CMD key). The SCP-CLI> prompt will appear.

   b. When you are ready to power up again, enter the RESET command:

   SCP-CLI> RESET ⅃

   c. Instruct the SCP CLI to boot the disk by entering the command BOOT 24, as follows. (The device code for hard disk is 24.)

   SCP-CLI> BOOT 24 ⅃

   d. The Operating System Load Menu will appear on your screen. Proceed as with a regular powerup.

A sample shutdown dialog follows.

```
                       Administrative Functions Menu

   .
   .
   .
   7 Shut down the system

   Enter choice: 7 ↲
```

```
                       Shut Down the System Menu

   1 Disable consoles from logging on
   .
   .
   .

   Enter choice: 1 ↲
```

Press NEW LINE to disable all consoles, or press Cancel/Exit (F11). ↲

```
                       Shut Down the System Menu

   .
   2 List all processes running
   .
   .
   .

   Enter choice: 2 ↲
```

```
Elapsed 14:40:33, CPU  0:00:35.835, I/O Blocks   5, Page Secs 4603
PID:    1 PMGR          PMGR             :PMGR.PR
PID:    2 OP            OP               :CLI.PR
PID:    3 OP            EXEC             :UTIL:EXEC.PR
PID:    4 OP            CON6             :UTIL:XLPT.PR
PID:    5 OP            INFOS_II         :INFOS:INFOS_II.PR
PID:    6 CEO_MGR       CEO_FSA          :UTIL:CEO_DIR:CEO_FSA.PR

PID:    7 CEO_MGR       CEO_LOG          :UTIL:CEO_DIR:CEO_LOG.PR
PID:    8 CEO_MGR       CEO_POA          :UTIL:CEO_DIR:CEO_POA.PR
PID:    9 CEO_MGR       CEO_CSA          :UTIL:CEO_DIR:CEO_CSA.PR
PID:   10 CEO_MGR       CEO_QMA          :UTIL:CEO_DIR:CEO_QMA.PR
PID:   11 SANDY         CON4             :CLI.PR
PID:   12 SYSMGR        CON3             :UTIL:SMI.PR
PID:   13 CHRIS         CON8             :UTIL:SMI.PR
PID:   14 CHRIS         CEO_CP_13        :UTIL:CEO_DIR:CEO_CP.PR
PID:   15 JR            CON9             :UTIL:SMI.PR
PID:   16 JR            CEO_CP_15        :UTIL:CEO_DIR:CEO_CP.PR
PID:   17 SYSMGR        00017            :CLI.PR
PID:   18 SANDY         CEO_CP_11        :UTIL:CEO_DIR:CEO_CP.PR
PID:   19 CHRIS         CEO_WP_14        :UTIL:CEO_DIR:CEO_WP.PR
PID:   20 LEE           CON7             :CLI.PR
PID:   21 SANDY         CEO_WP_18        :UTIL:CEO_DIR:CEO_WP.PR
```

Press NEW LINE to continue.
⅃

```
 _____
/                                                                \
|                                                                |
|                   Shut Down the System Menu                    |
|                                                                |
|                                                                |
|        .                                                       |
|        .                                                       |
|      3 Send a message to all users                             |
|        .                                                       |
|        .                                                       |
|        .                                                       |
|                                                                |
|                                                                |
|      Enter choice: 3 ⅃                                         |
|                                                                |
|                                                                |
_____/
```

069-000129

Type the message you want to send to all system users; then press NEW LINE.

The system will be coming down at 5 tonight. Please finish up and log off.)

From Pid 12 : \SYSMGR\ *- The system will be coming down at 5 tonight. Please finish up and log off.*

Press NEW LINE to continue.
)

(Wait 10 minutes; then see who's still on the system.)

```
                        Shut Down the System Menu


       .
       2 List all processes running                                    |
       .

       .

       .

       Enter choice: 2 )
```

```
Elapsed  8:50:56,  CPU 0:00:36.015,  I/O Blocks    5, Page Secs 4610
PID:     1 PMGR          PMGR          :PMGR.PR
PID:     2 OP            OP            :CLI.PR
PID:     3 OP            EXEC          :UTIL:EXEC.PR
PID:     4 OP            CON6          :UTIL:XLPT.PR
PID:     5 OP            INFOS__II     :INFOS:INFOS__II.PR
PID:     6 CEO__MGR      CEO__FSA      :UTIL:CEO__DIR:CEO__FSA.PR
PID:     7 CEO__MGR      CEO__LOG      :UTIL:CEO__DIR:CEO__LOG.PR
PID:     8 CEO__MGR      CEO__POA      :UTIL:CEO__DIR:CEO__POA.PR
PID:     9 CEO__MGR      CEO__CSA      :UTIL:CEO__DIR:CEO__CSA.PR
PID:    10 CEO__MGR      CEO__QMA      :UTIL:CEO__DIR:CEO__QMA.PR
PID:    11 SYSMGR        00011         :CLI.PR
PID:    12 SYSMGR        CON3          :UTIL:SMI.PR
PID:    15 JR            CON9          :UTIL:SMI.PR
PID:    20 LEE           CON7          :CLI.PR
```

Press NEW LINE to continue.
)

```
┌─────────────────────────────────────────────────────────────
│
│                    Shut Down the System Menu
│
│       .
│       .
│     3 Send a message to all users
│       .
│       .
│       .
│     Enter choice: 3 ⌡
│
│
└─────────────────────────────────────────────────────────────
```

Type the message you want to send to all system users; then press NEW LINE.

System coming down now. Please log off. ⌡

From Pid   12 :   ⌡SYSMGR⌡ -   System coming down now. Please log off.

Press NEW LINE to continue.
⌡

(Wait a minute; then see who's still logged on.)

```
┌─────────────────────────────────────────────────────────────
│
│                    Shut Down the System Menu
│
│       .
│     2 List all processes running
│       .
│       .
│       .
│
│     Enter choice: 2 ⌡
│
│
└─────────────────────────────────────────────────────────────
```

```
Elapsed  9:01:15, CPU  0:00:36.485, I/O Blocks    5, Page Secs 4613
PID:     1 PMGR          PMGR            :PMGR.PR
PID:     2 OP            OP              :CLI.PR
PID:     3 OP            EXEC            :UTIL:EXEC.PR
PID:     4 OP            CON6            :UTIL:XLPT.PR
PID:     5 OP            INFOS__II       :INFOS:INFOS__II.PR
PID:     6 CEO__MGR      CEO__FSA        :UTIL:CEO__DIR:CEO__FSA.PR
PID:     7 CEO__MGR      CEO__LOG        :UTIL:CEO__DIR:CEO__LOG.PR
PID:     8 CEO__MGR      CEO__POA        :UTIL:CEO__DIR:CEO__POA.PR
PID:     9 CEO__MGR      CEO__CSA        :UTIL:CEO__DIR:CEO__CSA.PR
PID:    10 CEO__MGR      CEO__QMA        :UTIL:CEO__DIR:CEO__QMA.PR
PID:    11 SYSMGR        00011           :CLI.PR
PID:    12 SYSMGR        CON3            :UTIL:SMI.PR
PID:    20 LEE           CON7            :CLI.PR
```

Press NEW LINE to continue.
⌡

```
                    Shut Down the System Menu


        .

        .

        .

    4 Terminate active processes

        .

        .


    Enter choice: 4 ⌡
```

```
Elapsed  9:02:32, CPU  0:00:36.825, I/O Blocks    5, Page Secs 4613
PID:     1 PMGR          PMGR            :PMGR.PR
PID:     2 OP            OP              :CLI.PR
PID:     3 OP            EXEC            :UTIL:EXEC.PR
PID:     4 OP            CON6            :UTIL:XLPT.PR
PID:     5 OP            INFOS__II       :INFOS:INFOS__II.PR
PID:     6 CEO__MGR      CEO__FSA        :UTIL:CEO__DIR:CEO__FSA.PR
PID:     7 CEO__MGR      CEO__LOG        :UTIL:CEO__DIR:CEO__LOG.PR
PID:     8 CEO__MGR      CEO__POA        :UTIL:CEO__DIR:CEO__POA.PR
PID:     9 CEO__MGR      CEO__CSA        :UTIL:CEO__DIR:CEO__CSA.PR
PID:    10 CEO__MGR      CEO__QMA        :UTIL:CEO__DIR:CEO__QMA.PR
PID:    11 SYSMGR        00011           :CLI.PR
PID:    12 SYSMGR        CON3            :UTIL:SMI.PR
PID:    20 LEE           CON7            :CLI.PR
```

Enter the PID of each process you want to terminate: 20 ⌡

```
                    Shut Down the System Menu

          .
          .
          .
      5 Execute the DOWN macro
          .

      Enter choice: 5 ↵
```

(Depending on the DOWN macro, you might see some messages from the system here.)

```
                    Shut Down the System Menu


          .
      2 List all processes running
          .

          .
          .

      Enter choice: 2 ↵
```

```
Elapsed  9:03:02, CPU  0:00:36.835, I/O Blocks    5, Page Secs 4614
PID:    1 PMGR          PMGR          :PMGR.PR
PID:    2 OP            OP            :CLI.PR
PID:    3 OP            EXEC          :UTIL:EXEC.PR
PID:    4 OP            CON6          :UTIL:XLPT.PR
PID:    5 SYSMGR        00005         :CLI.PR
PID:   12 SYSMGR        CON3          :UTIL:SMI.PR

Press NEW LINE to continue.
↵
```

```
                    Shut Down the System Menu

       .
       .
       .
6 Shut down the system

Enter choice: 6 ↵
```

```
                       Shut Down the System

    Before you shut down the system, be sure there are no active
    processes aside from PMGR, OP, EXEC, XLPT, and your own PIDs.
    If you haven't yet done this, enter N or just press NEW LINE
    and you will return to the Shut Down the System Menu.

    Do you want to shut down the system now (Y or N)? Y ↵
```

*** *Starting system shutdown* ***

(This line appears on the console at which SYSMGR invoked the shutdown. The next two lines display on the system console.)

System shutdown

Please turn off power.

(SYSMGR turns off power to the computer.)

Where to Find More Information

While the SMI menu series can be a great help to you in performing system management tasks, you might find that you need information on functions beyond the scope of SMI.

How to Generate and Run AOS/VS is a comprehensive manual on managing an AOS/VS system. Don't let the size of the manual discourage you. We have written it in a way that allows you to look up a task and learn how to perform it without reading the whole manual. We do suggest, however, that you read the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)* before using *How to Generate and Run AOS/VS*, and that you read through the first chapter of the latter manual before referring to specific portions of it.

If you want more help on using the SMI, select option "5 Run the interactive system management tutorial" on the SMI Main Menu. The tutorial consists of several lessons on AOS/VS system management that you can run in any order. It can help you become more comfortable with the SMI program.

See the Preface of this manual for a list of other manuals that you may find helpful.

End of Chapter

Chapter 4
Backing Up and Restoring Files

The first part of this chapter is for the

| System Manager | ✔ |

| System User | ✔ |

This chapter describes the process of backing up and restoring files. Backing up or *dumping* files means copying disk files to another type of media, such as diskettes or tape. Restoring or *loading* files means putting backed-up files on the disk. Backing up files is also referred to as *archiving*.

Both the system manager and individual users will want to read at least part of this chapter; the system manager will need to do system-wide backups, while system users might want to back up their own files or other files to which they have access.

The descriptions in this chapter deal only with logical file backup, which is backing up files by user. In other words, on a system-wide backup, User A's files are backed up, and then user B's files, and so on. In comparison, physical backup entails copying all the files on a disk in the order in which they are stored on the disk. We describe physical backup (using the PCOPY utility) in Chapter 2, because it is an option on the Starter Main Menu.

Why Back Up Files?

You can store a lot of important, and often irreplaceable, information on your computer system. The hard disk on which the information is stored is stable and reliable, but it is not invulnerable. Accidental (or malicious) deletions or mechanical failure could destroy information on the disk.

Regular backup procedures ensure that you can restore files — like documents, reports, letters, business data, and programs — in case they are lost.

System-Wide Backups Versus Personal File Backups

The system manager is responsible for performing system-wide backups at regular intervals. A system-wide backup is a backup of all user files on the system. It does not back up the actual AOS/VS system and utility files; these you can restore from your release media

(tape or diskette) if necessary. See the section "Scheduling Your Backups" to determine how often system-wide backups should be performed.

Although most system managers do perform regular system-wide backups, individual users often want to keep a more recent copy of important files they are working on day to day. While a system-wide backup makes a copy of all user files, a personal file backup can contain as many or as few files as the user wants. It can contain files in the user's own directory, or in any directory to which the user has access.

For example, suppose the system manager, Sandy, does system-wide backups every Friday afternoon; but Lee has a file named DOC.TXT that is updated every day and is critically important. Lee might want to back up DOC.TXT every afternoon so that if something goes wrong, Lee can restore the file from a more recent copy than Sandy's weekly copy.

In addition, personal file backups allow a user to make a copy of one or a few files on tape or diskettes to take and load onto another system.

Full Versus Incremental Backups

A full system-wide backup copies all the files on the disk, which can take hours, and use many diskettes. An incremental backup copies only files that are new or changed since the last full backup; therefore it could take as little as one or two diskettes and a few minutes. Restoring files from full or incremental backups is not difficult; you restore each incremental set, from the latest to the earliest, and then the full backup set.

If you do few full backups and many incremental backups, you'll spend less time doing backups, but more time restoring files. Also, you'll need to keep track of more backup sets. Another disadvantage is that *all* the files that were ever backed up are restored from the backup diskettes or tapes. This means that if you have to restore a whole disk, someone will have to go through the directories and delete all the old files that were purposely deleted since the last full backup. (The computer can't tell the difference between files that were deleted intentionally and files deleted accidentally.) Finally, if you are using tape, you will have to use a whole tape for each backup, whether full or incremental. This means that for incremental backups, a lot of tape will be wasted.

On the other hand, if you do only full backups, or just one or two incremental backups between full backups, restoration is easy, and little cleanup is necessary if you have to restore a whole disk. But the amount of diskettes and the time involved doing full backups may be unacceptable. Generally, if you are using diskettes, a good compromise is one full backup followed by four to seven incremental backups. If you are using tapes, however, you might decide to do full backups more often, since you will waste much less tape, and full backups don't take as long with tape as they do with diskettes. For tapes, you might want to do one full backup followed by one or two incremental backups.

Note that incremental backups via the SMI menus are an option on system-wide backups only. Individual system users performing personal file backups with SMI must do full backups, but they can specify which files they want to back up.

Logical Versus Physical Backups

The backup and restoration procedures covered in this chapter are for logical backups. A *logical backup* is one in which files are copied onto media by user; for example, on a system-wide backup, user Sandy's files might be copied first (files in :UDD:SANDY), and then user Lee's files, and then user Dale's files, and then user SYSMGR's files, and so on. On the other hand, a *physical backup* copies files in the order they are physically stored on the disk; that is, one portion of the physical backup might contain the files

:UDD:SYSMGR:PROJECTS:JOBINC:STATUS:86.05.15, :UDD:SANDY:PHONES, and :UDD:DALE:NOTES:10.06.86, in that order. A physical backup copies every used sector of the disk.

The advantage of doing logical backups is that you don't copy the AOS/VS system files. You don't need to — you have them on your release media already. Logical backups are also helpful for users; they can back up any or all of their own personal files, or other files to which they have access. However, doing a full system-wide backup logically, especially to diskettes, can take enormous amounts of media and hours of your time. You might find that it is more convenient for you to do full system-wide backups physically (using PCOPY) and to do incremental backups logically (using the SMI archive menus). To restore the files in this case, you would restore the system-wide physical backup using the Starter program first, and then restore the incremental backups.

There are disadvantages to physical backup, however. You can run stand-alone PCOPY only when AOS/VS is not running. With stand-among PCOPY, the target disk cannot be initialized into the file system. Also, the SMI makes logical backup and restoration easy. It cannot help you with physical backup.

We described how to back up and restore the system disk using PCOPY in Chapter 2.

Scheduling Your Backups

The frequency with which you do backups, whether system-wide or personal, depends on the rate at which information develops at your particular installation, and the importance of the new information. We recommend that full system-wide backups be done a minimum of once a month, with an incremental backup at least once a week. You might want to vary the frequency of backups based on the development of new information — that is, do more backups during periods of high activity. However, we caution you that, like many boring tasks, file backups are more likely to happen if they are done at regular intervals.

Individual users backing up personal files should use their own discretion with respect to backup frequency, taking into consideration how often system-wide backups are done and how often the information in their files is updated. As with system-wide backups, we recommend that you back up personal files on a regular schedule, to ensure that the procedure gets done.

What Types of Media Are Available?

You can use either diskettes or tape to back up and restore files, depending on which drive(s) you have on your system. The files you are backing up are located on the hard (or Winchester) disk inside the system. We describe the procedures for backing up and restoring personal or system-wide files with both diskettes and tape after we discuss the different media types.

You might want to do your backups on diskettes; but if your system has both tape and diskette drives, you should be aware that a tape holds much more information than a diskette does, so you will need to use many more diskettes than tapes. This may not be an issue for personal backups, since the amount of data being dumped is not usually great; but it is an important consideration for system-wide backups. The later section on "Backing Up System-Wide Files" explains this in more detail.

Note that whatever type of media you use, you should have at least two backup sets. That way, when you perform a backup, you can save the most recent backup and use the other

set of tapes or diskettes for the current backup. If anything were to go wrong with the new backup, you would still have your most recent set of tapes or diskettes from which to restore files, if necessary.

Using Diskettes

Diskettes are relatively fragile; they are thin plastic protected only by a thin inner envelope and a thicker outer envelope. Use care when handling your diskettes, and *never remove a diskette's inner envelope.* Slide a diskette out of its outer envelope and examine it. One side will have a paper label on it, and the other side will be blank. On each side, the inner envelope is cut away to expose part of the diskette surface. *Be very careful not to touch the diskette surface.* Any oil or dust on your fingers could make that part of the diskette unreadable.

Figure 4-1 shows a diskette held in the proper way.

Note that one edge of the diskette has a small notch, about 1/4 x 1/4 inch. This is the write-enable notch. When the notch is uncovered, data can be written to the diskette. When the notch is covered (as with opaque tape), the diskette is write-protected; it cannot be written to. When doing backups to diskettes, be sure the write-enable notch is not covered.

Read through the following notes and cautions about storing and handling diskettes before you use diskettes for backup.
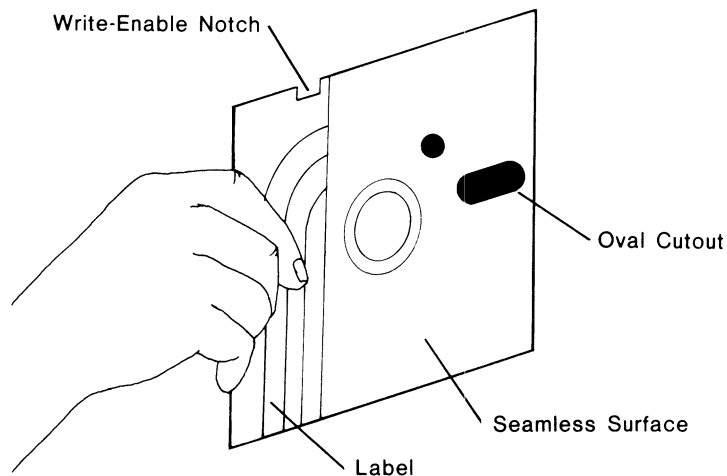
DG-27603

Figure 4-1. Holding a Diskette

Storing Diskettes

- Cold and heat can harm diskettes. Keep them temperate (between 10 and 50 degrees Celsius, between 50 and 125 degrees Fahrenheit).

- A magnetic field can erase part or all of the data on a diskette. Keep diskettes away from magnets, electric motors, and transformers.

- Store diskettes in their outer envelopes. Don't remove a diskette from its outer envelope until you are ready to use it. Never remove a diskette from its inner envelope.

- If a diskette has no paper label, apply one. Properly labeled diskettes can prevent lots of problems. Labels go on the smooth, seamless side of the inner envelope, at the top (with the write-enable notch to the right). *Be sure to avoid the oval cutout where the diskette surface is exposed.*

- To write on a diskette label, use only a felt-tipped pen. A pencil or ball-point pen can score the diskette surface, destroying some or all of the data on it.

Handling Diskettes

- Hold a diskette by the edges of the envelope only. *Take care to avoid touching the diskette surface.* (The diskette surface is exposed in oval sections on each side of the inner envelope.) The oil on your fingers could make that part of the diskette unreadable.

- Don't bend or twist a diskette. A crease on the diskette surface means data loss.

- To write-protect a diskette, put tape over the write-enable notch (a 1/4-inch slot on the edge of the inner envelope). You cannot write to a write-protected diskette; you will see error messages if you attempt to do this.

- Be sure to insert the diskette into the diskette drive correctly; the system cannot read one that is improperly inserted. When you insert a diskette, hold it by the edge, with the label (seamless side) facing right and the write-enable notch up. The diskette should slide into the drive smoothly and come to a firm stop.

- Turning off computer power while a diskette is inserted can lead to data loss. Remove diskettes from diskette drives before turning off the power.

- Diskettes must be hardware formatted (this is different from software formatting, which is done by the Disk Formatter). Diskettes you acquire from Data General are already hardware formatted, but diskettes from another vendor are not hardware formatted. A diskette that is not hardware formatted will produce a *HARD ERROR* or *PHYSICAL UNIT FAILURE* message.

  To hardware format a diskette, run the hardware formatting program described in ADES documentation. It's a good idea to hardware format non-DGC diskettes immediately after you purchase them.

- Diskettes can become worn. If you see the message *SOFT ERROR, DEVICE 64 0,* this is a warning that the diskette could be reaching the end of its life. Consider substituting a new diskette for the old one.

  A *HARD ERROR* or *PHYSICAL UNIT FAILURE* message means that the rest of the diskette is unreadable or unwritable. If this message occurs during backup, you will have to interrupt the backup and start over. Issue the CTRL-C CTRL-A sequence and select the backup option again. Do not use the diskette that was in the drive at the time you received the error.

If you receive this message during a restoration from backup, see if the error applies to the diskette or the hard disk (diskette device code is 64; hard disk is 24). If the error was on the diskette, you won't be able to complete the restoration. Your best course of action is to find the next most recent backup set of diskettes and restore from that.

If the hard error occurred on the hard disk, phone your Data General service representative.

Inserting a Diskette Into a Diskette Drive

To insert a diskette into a diskette drive, use the following procedure:

1. Turn the control arm beside the slot on the diskette drive counterclockwise until the arm is vertical.

2. Hold the diskette with the write-enable notch up and your fingers on the label. Slide it into the unit slot as shown in Figure 4-2. The diskette should slide in smoothly and come to a firm stop.

3. Turn the contol arm beside the slot clockwise until the arm is horizontal. This locks the diskette in the unit.
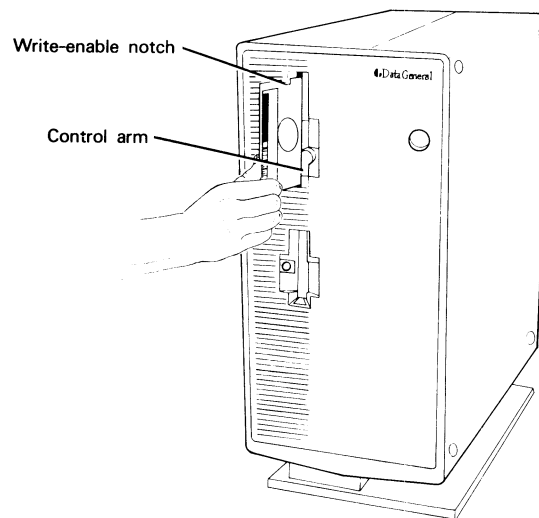
DG-27605

Figure 4-2. Inserting a Diskette Into a Diskette Drive

069-000129

Using Tapes

Three types of tape are available with MV/2000 DC and DS/7000-series systems, although not all types are available with all computers. There are two types of cartridge tape: model 6351 for MV/2000 DC and DS/7500-series systems, and model 6352 for DS/7700-series systems. Model 6351 tape is a 22-Mbyte cartridge, of which about 20 Mbytes are available for your use (the system uses the rest). Model 6352 tape is a 120-Mbyte cartridge, of which 70 to 120 Mbytes are usable, depending on the mode used for the backup. Our estimates in the section on System-Wide Backups called "Figuring How Many Tapes or Diskettes You Will Need" assume 70 Mbytes.

The other type is a reel-to-reel tape, model 6341, available with MV/2000 DC and DS/7000-series systems.

Figure 4-3 shows a model 6351 cartridge tape for MV/2000 DC and DS/7500-series systems.
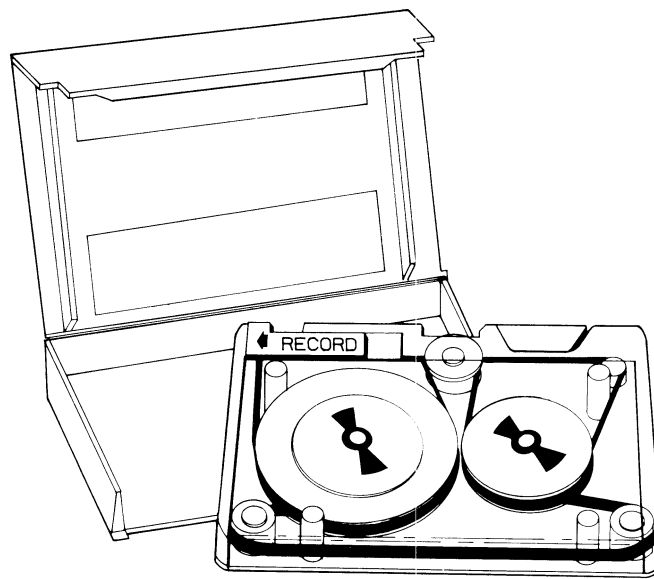
DG-27300

Figure 4-3. A Model 6351 Cartridge Tape

Figure 4-4 shows a model 6352 cartridge tape for DS/7700-series systems.
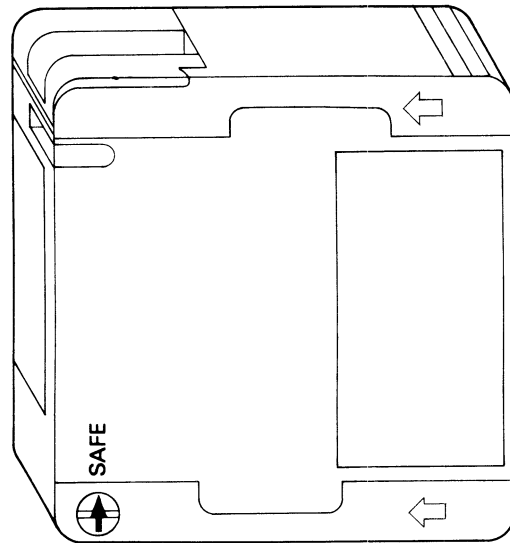
DG-27621

Figure 4-4. A Model 6352 Cartridge Tape

Figure 4-5 shows a model 6341 reel tape for MV/2000 DC and DS/7000-series systems.
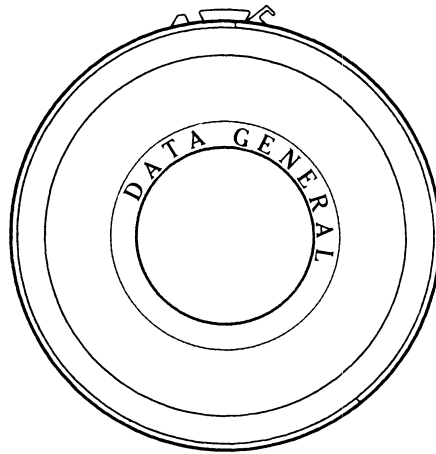
ID-03347

Figure 4-5. A Model 6341 Reel Tape

069-000129

Storing and Handling Cartridge and Reel Tapes

Observe the following tips on storing and handling tapes.

- Each cartridge tape is packaged in a plastic case. Store the tape in its case when you aren't using it. Dust and dirt can damage both the tape cartridge and the tape drive.

- Each reel tape is packaged in a plastic case or with a plastic rim around its periphery, protecting the tape. Keep the tape in its case, or replace the tape's rim when the tape is not in use; dust and dirt can damage both the tape and the tape drive.

- Store cartridges and reels in a clean, dry place.

- Store tapes away from magnets and any equipment that produces a magnetic field, such as a telephone, power supply, printer, or terminal.

- Do not touch parts of a cartridge tape that are exposed in the openings of the cartridge. The oil or dust on your fingers could make the data on the tape inaccessible to the computer.

- On reel tapes, unwind only as much tape as is necessary to thread the tape when you mount it on the drive. If you touch an area of tape that contains data, you could make it unreadable to the computer.

Verifying Material Backed Up on a Model 6351 Tape Drive

On most tape drives, backed-up material will be restored correctly because the tape drives have a read head that verifies material when it is written by the write head. The model 6351 tape drive is an exception to this general design; it has only one head. For this reason, it is possible, especially with old tape, to back up to a tape that cannot be read. When you use model 6351 tape, you can verify the material you back up by using the CLI command LOAD_II with the /N and /BUFFERSIZE=16384 switches, and specifying a device name. If the system can read the tape, it will display on your screen the names of the files dumped.

You can issue this command by specifying the CLI keyword, which will place you in the CLI. Issue this keyword from any menu, as follows:

Enter choice: CLI)

Respond to the resulting SMI_CLI) prompt as follows:

SMI_CLI) LOAD_II/N/BUFFERSIZE=16384 @MTJ0)

The names of the files that were backed up will display on the screen. If there are any errors in the dump, these will also display. You will then have to rewind the tape. Issue the following command.

SMI_CLI) REWIND @MTJ0)

The tape on the cartridge will rewind. Type BYE to exit from the CLI, as follows:

SMI_CLI) BYE)

You will return to the SMI menu from which you specified the CLI option.

If the names of the files you dumped did not display on the screen, then your tape is probably unreadable. Discard the tape and repeat the backup procedure with a new cartridge.

Write-Protecting the Tape

When you insert a cartridge tape into the tape drive, or mount a reel tape on a drive, the computer can use the tape in either of two ways: it can read information from the tape or it can write information to the tape. When the computer reads from the tape, the information on the tape remains intact. But when the computer writes to the tape, the information previously on the tape is erased or overwritten.

To protect the information on a tape from being erased, you can *write-protect* the tape. Use the following instructions to do so.

Model 6351 Cartridge Tape:

Slide the switch labeled RECORD in the opposite direction indicated by the arrow next to RECORD (in other words, towards the middle of the tape). New information cannot be written to the tape unless the RECORD switch is repositioned in the direction shown by the arrow.

Model 6352 Cartridge Tape:

To write-protect a model 6352 tape, hold the tape with the arrows at the lower left and right corners pointing upwards and the word SAFE in the upper left corner. A small plastic screw is to the left of the word SAFE. Note that the screw has an arrow in it, which is probably pointing either left or right, and a vertical groove at right angles to the arrow. When the tape is write-protected, the arrow is pointing to the word SAFE.

If the arrow is not pointing right, turn it as follows. With your finger on the back of the tape, push in the round screw area so the screw on the front of the tape protrudes out of the cartridge. While the screw is protruding, insert a fingernail, coin, or small flat-head screwdriver into the groove and turn the screw so that the arrow points to the word SAFE (that is, to the right). Release the pressure on the back side of the tape, and the screw will settle back into its place in the cartridge. Be sure the arrow is still pointing to the word SAFE.

Reel-to-Reel Tapes:

Reel tapes are always write-protected unless you insert a plastic write-enable ring into the groove on the back side of the tape. If your tape has a write-enable ring on it and you want it to be write-protected, just remove the ring by grasping the tab on the ring and pulling it out. It's a good idea to remove the write-enable ring when you are restoring files, so you can't overwrite them by mistake if you accidentally select tape backup instead of restoration.

Inserting a Model 6351 Cartridge Tape

To insert a model 6351 cartridge tape into the drive, use the following steps.

1. Remove the tape from its plastic case.

2. Be sure the RECORD switch is in the proper position for what you want to do. That is, pushed to the left if you want to record, or pushed to the right if you want to prevent recording.

3. Hold the tape vertically, with the metal plate on the left and your hand on the paper label.

4. Slide the tape into the opening of the tape drive until you hear a click and feel the cartridge lock into place.

5. If the computer's power is on, you will hear a whirring noise after you insert the tape, and will see the red READY light go on (if present). If the light doesn't go on after you insert the cartridge, make sure the cartridge is inserted all the way into the drive. Wait about a minute and if the light is still off, remove the cartridge tape and try again. If the light still does not go on, telephone your Data General support center.

Figure 4-6 shows the correct way to insert a model 6351 cartridge tape into an MV/2000 DC or DS/7500-series system.

Metal plate
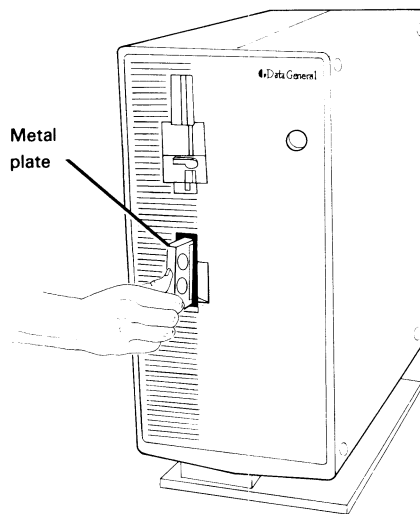
DG-27321

Figure 4-6. Inserting a Model 6351 Cartridge Tape

Inserting a Model 6352 Cartridge Tape

To insert a model 6352 tape into the drive, hold the tape with the movable flap up and towards the tape drive. Be sure the raised arrows are on the left side of the cartridge with the paper label. The arrows must point towards the drive. Refer back to Figure 4-4 to see the correct way to hold the tape. Also be sure the indented arrow on the small plastic screw next to the word SAFE is pointing in the correct direction; that is, to the left if you want to write to the tape and to the right if you want to prevent recording.

Push the UNLOAD button (the topmost button to the right of the tape drive door. The door to the drive will pop open. Slide the tape into the drive. It should insert easily and come to a stop with about 1/2 inch of the tape still visible outside the drive. Push the door closed. As you do so, you will see the tape move and settle to the right. Close the door firmly, so that the latch on the door catches. The red LED light by the UNLOAD button will illuminate.

Press the LOAD button. The LED light by the LOAD button will blink on and off as the drive loads the tape, and you might hear a whirring sound. The load procedure will take about half a minute, and then the LOAD light will remain lit steadily when the tape is finished loading.

Figure 4-7 shows the correct way to insert a model 6352 cartridge tape into a DS/7700-series system.
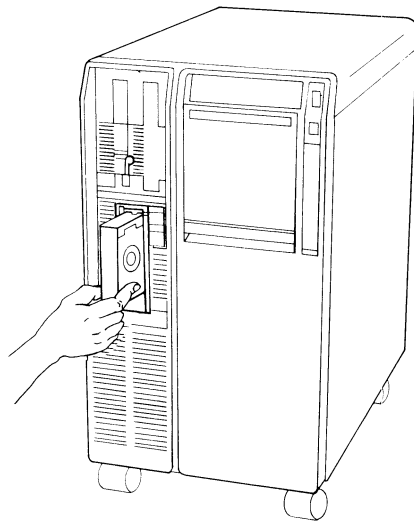
DG-27314

Figure 4-7. Inserting a Model 6352 Cartridge Tape

Removing a Model 6351 Cartridge Tape

To remove a model 6351 cartridge tape from a tape drive, press the eject button located on the left of the tape drive door. Remove the tape cartridge.

NOTE: When you press the eject button to remove a cartridge tape, the button will stay pushed in. *Do not try to pull the eject button out.* The button will spring out automatically when you insert a cartridge tape into the drive.

Removing a Model 6352 Cartridge Tape
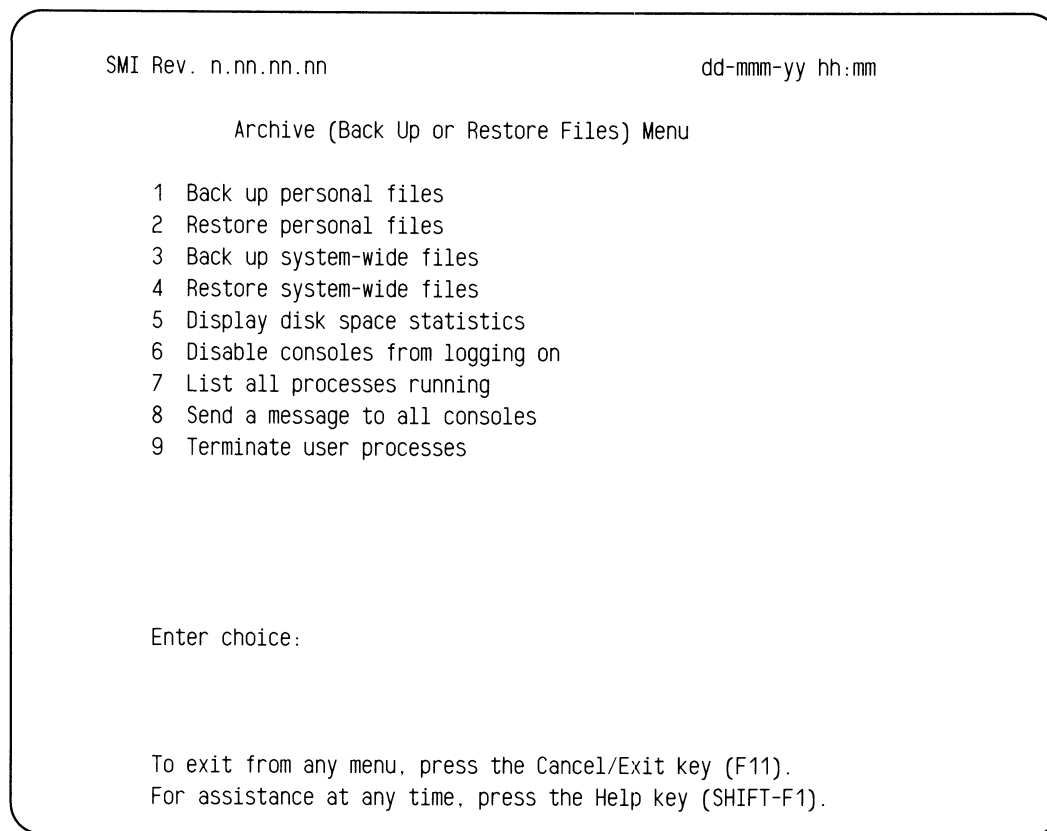
To remove a model 6352 cartridge tape from a tape drive, press the UNLOAD button. The light next to the button will blink on and off as the tape is unloaded, and you might hear a whirring sound. After about half a minute, the tape will be completely rewound and the UNLOAD light will remain lit steadily. Press the UNLOAD button again. The tape drive door will pop open. Push the door open wider and the tape will pop out far enough for you to grasp it. Remove the tape, label it (if appropriate), and store it safely.

Mounting and Dismounting Reel Tapes

To mount and dismount reel tapes on a model 6341 tape drive, refer to the documentation that came with the tape drive.

Using the SMI Archive Menus (ARCHIVE)

To perform file backup or restoration, select option "2 Back up (dump) or restore (load) files" on the SMI Main Menu. Or you can issue the keyword ARCHIVE from anywhere in the SMI menu series. For users with the System Manager privilege in their profiles, the screen shown in Figure 4-8 will then appear. For other system users, the same menu will appear, but only the first two options will show on the screen. Items 3 through 9 are available only for users who might need to perform system-wide backups.

```
SMI Rev. n.nn.nn.nn                              dd-mmm-yy hh:mm

            Archive (Back Up or Restore Files) Menu

        1  Back up personal files
        2  Restore personal files
        3  Back up system-wide files
        4  Restore system-wide files
        5  Display disk space statistics
        6  Disable consoles from logging on
        7  List all processes running
        8  Send a message to all consoles
        9  Terminate user processes




        Enter choice:



        To exit from any menu, press the Cancel/Exit key (F11).
        For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 4-8. Archive (Back Up or Restore Files) Menu

To return to the SMI Main Menu from the Archive Menu, press the Cancel/Exit function key (F11).

Backing Up Personal Files (BACKUP)

You can use SMI to back up one or more of the files in your own user directory, or in another directory to which you have W (Write), R (Read), and E (Execute) access. Select option "1 Back up personal files" on the Archive Menu, or specify the keyword BACKUP from any SMI menu. The Back Up Personal Files screen will appear, as shown in Figure 4-9. The default responses for each question or prompt will show up on the screen in uppercase, as shown.

```
SMI Rev. n.nn.nn.nn                              dd-mmm-yy hh:mm

                    Back Up Personal Files

    Back up to tape or diskettes? (T = Tape, D = Diskettes)    T


    Back up from which directory?  :UDD:USERNAME


    To back up all files, press NEW LINE. To back up specific
    files, type their pathnames or use templates.


    File(s):


    Send list of backed-up files to the printer, to a disk
    file, or don't create a list? (P = Printer, F = File,
    N = None)                                               P







    To exit from any screen, press the Cancel/Exit key (F11).
    For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 4-9. Back Up Personal Files Screen

Answer the questions and prompts. To accept a default value, just press NEW LINE while on that line. Otherwise, type the letter of the choice you want (for multiple choice questions). At the prompt for directory, type the pathname of the directory that contains the files you want to back up (the default is your initial user directory). You must have W (Write), R (Read), and E (Execute) access to this directory, and E access to any directories superior to it.

At the "File(s):" prompt, type the names of the files you want to back up. You must have R (Read) access to any file you specify. When the screen has all the correct information, press NEW LINE while at the last question. Alternatively, you can press the Execute key (F1) from anywhere on the screen and the system will accept all answers as they appear.

At the last question, if you specify to send the list of backed-up files to a disk file, you will be prompted to enter a filename. The default will be BACKUP.yy.mm.dd in your user directory, where yy is two digits for the year, mm is two digits for the month, and

dd is two digits for the day. If you want the listing to display on the console screen, specify @CONSOLE as the file name. *Be sure to look at this listing.* If any errors occur in the backup, this file will be the only place they show up.

For example, suppose user Terry's screen appears as in Figure 4-9, but Terry wants to use diskettes instead of tape (the default), and wants to back up just the files whose names begin with 01 (for example, 0140 and 0176) in the directory :UDD:TERRY:INVOICES. Terry also wants the list of files backed up to go to a disk file, using the default filename. Terry would enter D at the first prompt, type :UDD:TERRY:INVOICES at the prompt for a directory, specify the appropriate files (using a template) at the "File(s):" prompt, type F at the last prompt, and then press NEW LINE or the Execute key when the "Filename:" prompt came up showing the default filename.

Note that after Terry enters D in response to the media question, the SMI will write out the whole word DISKETTES on the screen; similarly, it will write out the word FILE on the screen after Terry enters F for the final question. The screen would then look like Figure 4-10.

```
SMI Rev. n.nn.nn.nn                              dd-mmm-yy hh:mm


                    Back Up Personal Files


   Back up to tape or diskettes? (T = Tape, D = Diskettes)    DISKETTES


   Back up from which directory?   :UDD:TERRY:INVOICES


   To back up all files, press NEW LINE. To back up specific
   files, type their pathnames, or use templates.


   File(s): 01+


   Send list of backed-up files to the printer, to a disk
   file, or don't create a list? (P = Printer, F = File,
   N = None)                                                  FILE


   Filename: :UDD:TERRY:BACKUP.86.09.19



   To exit from any screen, press the Cancel/Exit key (F11).
   For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 4-10. Sample Back Up Personal Files Screen

Once you fill in the Back Up Personal Files screen, the screen will clear and, after a brief pause, the system will begin instructing you how to perform the backup. Note that if you decide to cancel your backup when it is already underway, the Cancel/Exit key will work only when a prompt appears on the screen. While the system is copying files to the tape or diskette, it doesn't recognize the Cancel/Exit key. You can, however, interrupt a backup to diskettes by issuing the CTRL-C CTRL-A sequence at any time.

Backing Up Personal Files to Diskettes

For a personal files backup, one or two diskettes should be adequate. When you have finished entering information on the Back Up Personal Files screen, and have pressed NEW LINE or Execute, use the following steps. (Note that all italicized text in the first column is system output. Text in parentheses describes what the system is doing.)

System Message or Action	Your Action
	Using a felt-tipped pen, label the first diskette with the date and VOL01. Insert it into the diskette drive.
** *Backup from directory <pathname> at hh:mm:ss on dd-mmm-yy* **	
Please insert the first diskette to receive backup material.	
This diskette and any others used for backup will be overwritten — so don't use diskettes that have material you want to keep.	
Please number the paper label of each diskette as it is filled so that — if needed — the diskettes can be restored in the correct order.	
— Beginning file backup —	
Please insert a diskette if not already inserted. *Unit [@DPJ10] Volume ID [VOL01]? [y]*	You already have a diskette inserted. Press NEW LINE to initiate the backup.
(The system copies files to the diskette. If it needs another diskette, it will prompt you as follows:)	
Please insert next diskette. *Unit [@DPJ10] Volume ID [VOL02]? [y]*	Label the second diskette with the date and VOL02. Remove the first diskette from the drive and insert the second. Press NEW LINE.
(The system continues to copy files to diskette. If it needs another diskette, it will prompt you as above.)	Respond accordingly, labeling the third diskette VOL03.

System Message or Action	Your Action
(When the backup is complete, the system will display the following:)	
** *Backup of <pathname> complete at hh:mm:ss* **	Remove the last diskette.
(The system will display the following:)	
Press NEW LINE to continue.	Press NEW LINE.
(The Archive Menu will appear on your screen.)	

Store your diskettes in a safe place. Be sure to observe the handling and storing cautions listed earlier.

Backing Up Personal Files to Tape

You will use just one tape to perform personal file backups to tape. Since one tape holds over 20 Mbytes of information, this should be more than adequate for your needs. If, for some reason, you need to back up more files than will fit on one tape, you will have to do separate backups.

When you select the personal file backup option, and have filled in the Back Up Personal Files screen, the following procedure will occur. (All italicized text in the first column is actual system output to the screen.)

System Message or Action	Your Action
(The SMI displays the following message:)	
Please mount or insert the tape, if not already done. Press NEW LINE when ready to continue.	
	Insert or mount a blank or scratch tape on the drive. When the tape is inserted or mounted correctly, press NEW LINE.
(The system will copy the files you specified at the Back Up Personal Files screen to the tape. When the backup is complete, the SMI will make the terminal beep and output the following message:)	
The backup is complete. Please remove the tape from the drive and label it with the date and filenames, if desired.	
Press NEW LINE when ready to continue.	
	Remove the tape and apply a label as instructed. Then press NEW LINE.
(The SMI will redisplay the Archive Menu.)	

Restoring Personal Files (RESTORE)

You will need to restore files from your personal backup if something happened to the files on the hard disk and your system manager's last system backup was not as recent as your personal backup. Or you might have accidentally deleted a file that you subsequently discovered you still need, or you might want to load a file from a tape or diskette that someone else has given you.

To restore personal files from backup, find your diskettes or tape containing the desired files. Then select option "2 Restore personal files" on the Archive Menu or use the keyword RESTORE from any SMI menu. The Restore Personal Files screen will appear, as shown in Figure 4-11.

```
SMI Rev. n.nn.nn.nn                              dd-mmm-yy hh:mm


                       Restore Personal Files


    Restore from tape or diskettes? (T = Tape, D = Diskettes)   T


    Load files into which directory?   :UDD:USERNAME


    Delete existing files with same names as backed-up files,
    or keep the more recent copy? (D = Delete, R = Recent)       R


    To restore all files, press NEW LINE. To restore specific files,
    type the pathnames by which they were backed up, or use templates.


    File(s):


    Send list of restored files to the printer, to a disk file,
    or don't create a list? (P = Printer, F = File, N = None)  P



    To exit from any menu, press the Cancel/Exit key (F11).
    For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 4-11. Restore Personal Files Screen

Answer the questions and press NEW LINE after each one, or press the Execute key (F1) from anywhere on the screen when all responses that appear on the screen are what you want. Specify whether you are restoring from tape or diskette. Then indicate which directory you want the files loaded into (be sure you have W (Write), R (Read), and E (Execute) access to the directory you specify, and E access to all directories superior to it). Next specify whether you want the system to delete files already on the disk (or on-line) that have the same names as files on the backup media. The alternative is to have the system compare the time-last-modified on the existing file and the backed-up file, and to keep whichever is newer.

For example, suppose the backup media contains a file named :UDD:CHRIS:PROJECT_STATUS, and a file by the same pathname exists on the disk already. Let's say you specify to keep the more recent copy. The system finds the time-last-modified to be 23-AUG-86 08:34:27 on the backed up version, but 07-SEP-86 16:48:22 on the disk version. In this case, it will keep the on-line version rather than restoring the file from media. Had you specified to delete existing files with the same names as backed up files, it would have restored the 23-AUG-86 version of the file and deleted the version dated 07-SEP-86.

After specifying RECENT or DELETE, indicate which files you want restored. To have all files on the tape or diskettes restored, just press NEW LINE. Then tell the system where to send a list of the restored files. If you specify to send the list of restored files to a disk file, you will be prompted for a filename. The default filename will be RESTORE.yy.mm.dd in your user directory, where yy is two digits for the year, mm is two digits for the month, and dd is two digits for the day of the month. For example

:UDD:DALE:RESTORE.86.09.15

is the file that contains the list of files restored to user Dale's directory on September 15, 1986. If you want the listing to display on the console screen, specify @CONSOLE as the file name. *Be sure to look at this listing.* If any errors occur during the restoration, this file will be the only record of them.

Once you have filled in the Restore Personal Files screen and pressed NEW LINE at the last prompt or the Execute key, the restoration will begin. Follow the steps in one of the next two sections, depending on which type of media you are using.

Restoring Personal Files from Diskettes

When you restore files from diskettes, you must use the diskettes in each fileset in the same order as you backed them up; that is, VOL01 comes first, and then VOL02, and so on. Use the following steps. Note that all italicized text in the first column is text the system outputs to the screen. Text in parentheses shows what the system is doing.

System Message or Action	Your Action
	Assemble all diskettes in the backup set in order. Insert the first diskette (VOL01) in the diskette drive.
** Restoration within directory <path-name> at hh:mm:ss on dd-mmm-yy **	
Please insert the first diskette of the backup fileset.	
Insert the fileset diskettes - when prompted - in the order in which they were originally dumped.	
- - Beginning file restoration - -	
Please insert a diskette if not already inserted.	You already have a diskette inserted.
Unit [@DPJ10] Volume ID [VOL01]? [y]	Press NEW LINE to start the restoration.

System Message or Action	Your Action
(The system copies the files from the diskette onto the hard disk. It then prompts you to insert the next diskette:)	
Please insert next diskette. *Unit [@DPJ10] Volume ID [VOL02]? [y]*	Remove the first diskette from the drive and insert the second (VOL02). Press NEW LINE when you are done.
	Repeat this procedure until the backup is complete. Be sure to insert diskettes in the correct order.
(When the restoration is complete, the SMI will display the following message:)	
** *Restoration of <pathname> complete* *at hh:mm:ss* **	Remove the last diskette from the drive. Save the set of backup diskettes at least until you have another, more recent, set.

Restoring Personal Files from Tape

To restore personal files from tape, have the desired tape ready. Then use the following steps. (All italicized text in the first column is actual system output.)

System Message or Action	Your Action
	Have your tape ready.
Please mount or insert the tape, if not *already done. Press NEW LINE when ready* *to continue.*	
	Mount or insert the tape. When it is mounted or inserted correctly, press NEW LINE.
(The system will copy the files from your tape onto the disk. When it is finished, it will display the following message:)	
The restoration is complete. Please remove *the tape from the drive.*	
Press NEW LINE when ready to continue.	
	Remove the tape and return it to storage. Press NEW LINE.
(The SMI will redisplay the Archive Menu.)	

The remainder of this chapter is for the

System Manager ☑

System User ☐

Backing Up System-Wide Files

It's a good idea to schedule your system-wide backups at a time when few, if any, people are using the system. For example, you might want to back up the system at 5:00 or 6:00 on Friday afternoon, or very early in the morning before most users are in. There are a couple of reasons for this:

• System-wide backups can slow down the system, inconveniencing other users.

• If any users have files open while you are performing the backup, the open files will not be backed up. Therefore, the backup would be incomplete.

For these reasons, options 5 through 8 are available on the Archive Menu, so you can notify active users that you will be performing a backup, and terminate active processes if you like.

To perform your system-wide backup, we recommend that you use the following steps:

1. Figure how many tapes or diskettes you will need for the backup.

2. Disable consoles so no more users can log on.

3. Determine if any users are logged on.

4. Notify your active users that you are going to do a system-wide backup. Instruct them to log off. (It might be a good idea to do this 10 or 15 minutes before you want to start the backup, to give the users a chance to finish up what they are working on.)

5. Terminate any user processes that are still active, so that no files will be opened during the backup.

6. Bring down CEO and INFOS II if they are running.

7. Perform the system-wide backup.

8. Bring CEO and INFOS II back up, if applicable.

9. Enable consoles so users can log back on.

We describe all of these steps in the next section.

You might prefer to reorder these steps; for example, some system managers like to broadcast a message before disabling consoles from logging on. Whatever procedure you decide to follow, be sure that all your system users are familiar with your backup procedure. In particular, be sure your users know that if they leave their terminals for extended amounts of time, their processes could be terminated if you decide to do a backup.

Figuring How Many Tapes or Diskettes You Will Need

The number of tapes or diskettes you will need to perform a system-wide backup depends on several factors.

- Whether you are doing a full or incremental backup.

- Which size hard disk you have.

- How full your disk is.

AOS/VS and its related files take up a certain amount of your disk space. If you also have CEO, INFOS II, or a programming language on your disk, this software will take up additional space. The remaining space is available for system users to use. Since you won't back up the AOS/VS or other software files, the number of diskettes or tapes your system-wide backup will need depends on how much of this remaining available disk space is being used.

Option "5 Display disk space statistics" on the Archive Menu lets you find out how much of your disk space is being used. When you enter 5, the system will send you statistics about the available space in your root directory. For example, suppose Lee's system has a 70-Mbyte disk. Lee selects option 5 and sees the following:

MAX 74410, CUR 38098, REM 36312

where *MAX* = maximum amount of available space.
       CUR = current amount of space in use.
       REM = remaining available space.

The value Lee is concerned with is the one for CUR, because the disk space currently in use holds the data Lee will be backing up.

The CUR value, however, represents some of the space that is holding AOS/VS files, which won't be backed up. So the first thing Lee must do is subtract an estimate of this space from the CUR value. You can get a good estimate by multiplying 1000 by the number of OS SYSTEM UTILITIES diskettes you received. (If you received your system on tape, just use 20,000 instead. It will be close enough.) Suppose Lee received 20 OS SYSTEM UTILITIES diskettes. Lee's CUR value would be adjusted as follows:

38098 – (1000 x 20) = 18098

Lee would then use the adjusted CUR value as follows, to determine the amount of media required.

Diskettes:

To figure approximately how many diskettes you will need, take the adjusted CUR value and divide it by 1300. Using the above statistics from Lee's system, for example, Lee would do the following:

18098/1300 = 14 diskettes

Model 6351 Tapes:

To figure how many model 6351 tapes you will need, take the adjusted CUR value and divide it by 39,000. Thus, using the statistics from Lee's system again, Lee would do the following:

18098/39000 = 1 tape

Model 6352 Tapes:

To figure how many model 6352 tapes you will need to perform the same backup, divide the new CUR value by 146,500. Again, using Lee's system as an example, Lee would obviously only need one tape of this type.

Therefore, you can see the advantage of backing up to tape (if you have that option).

Dealing with Active System Users

As we mentioned earlier, it is best to do system-wide backups when no other users are on the system. Therefore, before you do a backup, you should prevent more users from logging on, and have the current users log off the system.

Select option "6 Disable consoles from logging on" on the Archive Menu. Note that this option won't harm any users that are currently logged on; it will just prevent any additional users from logging on to the system. When current users log off, their terminals will be disabled from logging on again.

Next choose option "7 List all processes running." The system will display all active processes. For example, suppose it is nearly 5:00 p.m. on a Friday. You enter 7 at the Archive Menu and see the following:

```
Elapsed  8:04:52, CPU  0:00:32.725, I/O Blocks   28, Page Secs 7362
PID:     1 PMGR          PMGR           :PMGR.PR
PID:     2 OP            OP             :CLI.PR
PID:     3 OP            EXEC           :UTIL:EXEC.PR
PID:     4 OP            LPB            :UTIL:XLPT.PR
PID:     5 OP            INFOS__II      :INFOS:INFOS__II.PR
PID:     6 CEO__MGR      CEO__FSA       :UTIL:CEO__DIR:CEO__FSA.PR
PID:     7 OP            NETOP          :NET:NETOP.PR
PID:     8 OP            X25__LMGR      :NET:X25__LMGR.PR
PID:     9 SYSMGR        00009          :CLI.PR
PID:    10 SYSMGR        CON6           :UTIL:SMI.PR
PID:    11 CHRIS         CON21          :CLI.PR
PID:    14 SANDY         CON2           :CLI.PR
PID:    15 CHRIS         CEO__CP__11    :UTIL:CEO__DIR:CEO__CP.PR

        Press NEW LINE to continue.
```

Aside from yourself (SYSMGR), there are two users still logged on. You want to be sure all files will be backed up, so you don't want any users to be logged on while you are performing the backup. Press NEW LINE to return to the Archive Menu; then select option "8 Send a message to all consoles." At the screen that appears, type your message:

Type the message you want to send to all system users; then press NEW LINE.

Doing a system-wide backup in 10 minutes. Please finish up and log off.)

4-24

Wait the allocated time; then select option "7 List all processes running" again from the Archive Menu. The list of active processes will display.

```
Elapsed  8:14:58. CPU  0:00:32.825, I/O Blocks   28. Page Secs 7363
PID:      1 PMGR          PMGR            :PMGR.PR
PID:      2 OP            OP              :CLI.PR
PID:      3 OP            EXEC            :UTIL:EXEC.PR
PID:      4 OP            LPB             :UTIL:XLPT.PR
PID:      5 OP            INFOS_II        :INFOS:INFOS_II.PR
PID:      6 CEO_MGR       CEO_FSA         :UTIL:CEO_DIR:CEO_FSA.PR
PID:      7 OP            NETOP           :NET:NETOP.PR
PID:      8 OP            X25_LMGR        :NET:X25_LMGR.PR
PID:      9 SYSMGR        00009           :CLI.PR
PID:     10 SYSMGR        CON6            :UTIL:SMI.PR
PID:     14 SANDY         CON2            :CLI.PR

         Press NEW LINE to continue.
```

You see that user Sandy is still working. Suppose you send another message and Sandy still does not log off. You might conclude that Sandy is away from the terminal, and select option "9 Terminate user processes" to terminate Sandy's process. When you select option 9, the list of active processes will appear again, along with a prompt. Enter Sandy's PID number:

Enter the PID of each process you want to terminate: 14 ↵

Now you, as PIDs 10 and 9, are the only active user. You are ready to continue with the system-wide backup.

Bringing Down CEO and INFOS II Software

If your system is running CEO and/or INFOS II software, a system-wide backup won't back up CEO files or open INFOS II databases. To ensure that all files are backed up, shut down CEO and INFOS II before doing the backup. You can do so easily in one of two ways. Your system's DOWN macro brings down CEO, INFOS II, and the network. Unless your DOWN macro performs some tasks that you do not want done before a backup, you can bring down CEO and INFOS II simply by executing the DOWN macro. (Enter the keyword DOWN from any menu.) Note, however, that if you have networking software running and you choose to invoke the DOWN macro, then you will have to bring the network back up again after the backup, along with INFOS II and CEO.

Alternatively, you can use option "7 Send a command to the master CLI process" of the Administrative Functions Menu. Either use the Cancel/Exit function key to return to this menu, or issue the OPCOMMAND keyword from the Archive Menu. When you select this option, you will see a screen that prompts you to enter a CLI command line.

Enter the appropriate command, depending on whether you want to bring down CEO or INFOS II. (If you are bringing down both CEO and INFOS II, remember to bring down CEO first.) For example, to bring down CEO, you would type the following:

Enter a CLI command line:
:UTIL:CEODIR:DOWN.CEO ↵

To bring down INFOS II, you would answer the prompt as follows:

Enter a CLI command line:
:INFOS:INFOS_DOWN ↵

If you used the OPCOMMAND keyword, you will automatically return to the Archive Menu after you enter the command line. If you arrived at the Send a Command to the Master CLI Process screen by traversing the menus in the normal way, you can return to the Archive Menu in the same manner or by using the ARCHIVE keyword. Or you can proceed directly to the Back Up System-Wide Files screen by using the SYSBACKUP keyword. Remember that you will have to bring up INFOS II and CEO again after the backup. (We describe the procedure later in this chapter.)

Using the Back Up System-Wide Files Screen (SYSBACKUP)

When you are ready to start the system-wide backup, select option "3 Back up system-wide files" on the Archive Menu. (The keyword for this option is SYSBACKUP.) The screen shown in Figure 4-12 will appear.

```
SMI Rev. n.nn.nn.nn                              dd-mmm-yy hh:mm


              Back Up System-Wide Files


    Back up to tape or diskettes? (T = Tape, D = Diskettes)   T


    Full or incremental backup? (F = Full, I == Incremental)  F


    Send list of backed-up files to the printer, to a disk
    file, or don't create a list? (P = Printer, F = File,
    N = None)                                                 P














    To exit from any screen, press the Cancel/Exit key (F11).
    For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 4-12. Back Up System-Wide Files Screen

Select your media type, whether you want to do a full or incremental backup, and if you want a listing of backed-up files. The default responses appear in the right column. If the letter for the response you want already appears, press NEW LINE. To select an alternative response, type the appropriate letter. Note that when you press NEW LINE to accept a default value or after you type a letter, the entire word for that response will appear on the screen. When you are done with the screen, press the Execute key (F1) or press NEW LINE at the last question on the screen.

For example, suppose the defaults appear as shown in Figure 4-11, but you want the list of backed-up files to go to a disk file instead of to the printer. You would press NEW

LINE twice, once to select TAPE and once to select FULL; then type F at the third question. When you press NEW LINE this time, the system will write out the entire word FILE in the right column, and then prompt you for a filename. The screen would look like Figure 4-13.

```
  SMI Rev n.nn.nn.nn                                 dd-mmm-yy hh:mm

                    Back Up System-Wide Files                              *

   Back up to tape or diskettes? (T = Tape, D = Diskettes)    TAPE


   Full or incremental backup? (F = Full, I = Incremental)    FULL


   Send list of backed-up files to the printer, to a disk
   file, or don't create a list? (P = Printer, F = File,
   N = None)                                                  FILE


   Filename: :BACKUP.86.05.02






   To exit from any screen, press the Cancel/Exit key (F11).
   For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 4-13. Sample Back Up System-Wide Files Screen

Note that the default filename has the format :BACKUP.yy.mm.dd, where yy represents two digits for the year, mm represents two digits for the month, and dd represents two digits for the day. The file will be in the root directory, as indicated by the : before the filename. To accept this filename, press NEW LINE. To specify a different filename, type it and press NEW LINE. Specify @CONSOLE as the filename if you want the listing to display on the console screen. *Be sure to look at the listing.* If any errors occur during the backup, this file will be the only record of them.

Once you have finished entering information on the Back Up System-Wide Files screen, the system will begin the backup. Note that, if you decide to cancel the backup while it is in progress, you must press the Cancel/Exit key when a prompt appears on the screen. While the system is copying files to a tape or diskette, it does not recognize the Cancel/Exit key. You can interrupt a backup to diskettes at any time, however, by issuing the CTRL-C CTRL-A sequence.

The next four sections describe the following types of system-wide backup:

- Full system-wide backup to diskettes.

- Full system-wide backup to tape.

- Incremental system-wide backup to diskettes.

- Incremental system-wide backup to tape.

Full System-Wide Backup to Diskettes

If you specified a full backup using diskettes on the Back Up System-Wide Files screen, follow these steps to perform the backup. Note that all italicized text in the first column is system output.

System Message or Action	Your Action
	Label the first diskette in your set with the date and VOL01. Insert it in the diskette drive.
** Full backup from directory : at hh:mm:ss on dd-mmm-yy **	
Please insert the first diskette to receive backup material.	
This diskette and any others used for backup will be overwritten - - so don't use diskettes that have material you want to keep.	
Please number the paper label of each diskette as it is filled so that - - if needed - - the diskettes can be restored in the correct order.	
- - Beginning file backup - -	
Please insert a diskette if not already inserted. *Unit [@DPJ10] Volume ID [VOL01]? [y]*	You already have a diskette inserted. Press NEW LINE to begin the backup.
(The system copies files to the diskette; then prompts you when the first diskette is full.)	
Please insert next diskette. *Unit [@DPJ10] Volume ID [VOL02]? [y]*	
	Remove the first diskette. Label the next diskette with the date and VOL02 and insert it into the drive. Press NEW LINE.

System Message or Action	Your Action
(The system will continue to prompt you for diskettes until it is finished with the backup. Be sure to label each one correctly. When all files have been backed up, the system will display the following:)	
Please remove the diskette.	
** *Full backup of directory : complete at hh:mm:ss* **	Remove the last diskette.
This backup has created the file LAST_BACKUP in this directory for future backups. Don't delete this file.	

As the system message states, the backup also creates a file in the root directory called LAST_BACKUP. *Do not delete this file.* It is critical for future backups.

Store your tapes or diskettes in a secure place, and be sure to observe the handling and storing cautions listed earlier in this chapter.

Full System-Wide Backup to Tape

The number of cartridge or reel tapes you will need for system-wide backups varies, depending on how much of your disk is full. Use the formulas listed earlier for an estimate of how many tapes to have available. When you select the system-wide backup option, and have filled in the Back Up System-Wide Files screen, the following procedure will occur. (Italicized text in the first column is actual system output.)

System Message or Action	Your Action
	Have an appropriate number of blank or scratch tapes handy.
Please mount or insert the first tape, if not already done. Press NEW LINE when ready to continue.	
	Insert or mount a blank or scratch tape on the drive. When the tape is inserted or mounted correctly, press NEW LINE.
(The system will begin to copy the system-wide files to the tape. When the first tape is full, the SMI will make the terminal beep and display the following message:)	
Remove the tape from the drive and mount or insert a new tape. Please write the volume number on a label and place it on the tape you removed. The volume number is VOL01.	
Press NEW LINE when ready to continue.	
	Remove the first tape and insert a second, as prompted. Write the date and the system-specified volume number on a paper label and apply it to the first tape. Press NEW LINE to signal the system to resume copying files to tape.

System Message or Action	Your Action
(The system will continue to copy files to tape until the second tape is full or all files have been copied. If it needs another tape, it will prompt you for it, as above.)	
(When the backup is complete, the system will make the terminal beep and output the following message:)	
The backup is complete. Please remove the last tape from the drive. Write the volume number on a label and place it on the tape. The volume number is VOLnn.	
Press NEW LINE when ready to continue.	
(where *nn* is the correct tape volume number.)	Remove the last tape and apply a label as instructed. Then press NEW LINE.
(The system will redisplay the Archive Menu.)	

The system also creates a file in the root directory called LAST-BACKUP. *Do not delete this file.* It is critical for future backups.

Incremental System-Wide Backup to Diskettes

When you select incremental backup using diskettes via the Back Up System-Wide Files screen, use the following steps.

System Message or Action	Your Action
	Label your first diskette with the date and INC (for incremental). Also label it VOL01. Insert the diskette into the diskette drive.
** Incremental backup from directory : at hh:mm:ss on dd-mmm-yy **	
This backup will dump all files created or modified since dd-mmm-yy - - hh:mm:ss	
Please insert the first diskette to receive backup material.	
This diskette and any others used for backup will be overwritten - - so don't use diskettes that have material you want to keep.	
Please number the paper label of each diskette as it is filled so that - - if needed - - the diskettes can be restored in the correct order.	

System Message or Action	Your Action
- - Beginning file backup - -	
Please insert a diskette if not already inserted. *Unit [@DPJ10] Volume ID [VOL01]? [y]*	You already have a diskette inserted. Press NEW LINE to initiate the backup.
(The system begins copying new or modified files to the diskette. If it needs another diskette, it will prompt you.)	
Please insert next diskette *Unit [@DPJ10] Volume ID [VOL02]? [y]*	
	Remove the first diskette. Label the second diskette as you did the first, calling it VOL02 instead of VOL01. Insert VOL02 into the diskette drive. Press NEW LINE.
(The system will continue to copy files to the diskette. If it needs more diskettes, it will prompt you as above. When the backup is finished, the system will display the following message:)	
*** Incremental backup of directory : complete at hh:mm:ss ***	Remove the last diskette. Store the diskettes in a secure place, observing the handling and storing cautions listed in Chapter 3 and earlier in this chapter.
This backup has created the file LAST_BACKUP in this directory for future backups. Don't delete this file.	

It is important that you heed the system's last message and *do not delete the file :LAST_BACKUP.* It is critical for future backups. Store your diskettes in a safe place.

Incremental System-Wide Backup to Tape

Incremental system-wide tape backup proceeds the same as full system-wide tape backup. Refer to the earlier section "Full System-Wide Backup to Tape" for details.

Bringing Up INFOS II and CEO After the Backup

If you brought down CEO and/or INFOS II to perform the system-wide backup, or if they weren't running previously, but you want to start them up now, you can do so via the same option we described earlier. Either get to the Administrative Functions Menu and select option "7 Send a command to the master CLI process," or specify the OPCOMMAND keyword. You will see a prompt to enter a CLI command line.

If you are starting up both INFOS II and CEO, be sure to start up INFOS II first. CEO software uses an INFOS II database, so INFOS II must be running before CEO comes up. To start up INFOS II, answer the prompt in the following way:

Enter a CLI command line:
:INFOS:INFOS_UP)

To start up CEO, respond to the prompt as follows:

Enter a CLI command line:
:UTIL:CEO_DIR:UP.CEO)

If you brought these products down by running the DOWN macro, and also had networking software running, you will have to bring the network back up too. Execute the UP.NETWORK.CLI macro, being sure to enter the correct pathname (:UP.NETWORK or :NET:UTIL:UP.NETWORK, depending on where in the file system your UP.NETWORK.CLI macro is located).

For example, if your UP.NETWORK.CLI macro is located in the root directory, you would respond to the prompt as follows:

Enter a CLI command line:
:UP.NETWORK)

If you used the OPCOMMAND keyword to perform any of these functions, you will return to the Archive Menu after you enter the command line. Otherwise, you will remain in the Administrative Functions Menu.

Enabling Consoles After the Backup

After you have performed the system-wide backup (and started up INFOS II and CEO, if applicable), re-enable consoles so users can resume working. (Note that if you didn't use option "5 Disable consoles from logging on" on the Archive Menu, you won't need to enable consoles now.)

There are two ways you can enable consoles from the SMI. You can do so from the Manage Consoles Menu (to which you can get by selecting option "2 Manage consoles" on the Administrative Functions Menu). Enabling consoles is option 5 on the Manage Consoles Menu. Or you can enable consoles while still at the Archive Menu or any other SMI menu by entering the keyword CENABLE. That is, you would enter the following at the menu's prompt:

Enter choice: CENABLE)

The Enable Consoles screen would appear, at which you would specify to enable all consoles (the default) by pressing NEW LINE at the prompt. For example,

Console(s):)

All consoles would then be enabled for users to log on, and the Archive Menu (or whatever menu you were at) would be redisplayed on your screen.

Restoring System-Wide Files (SYSRESTORE)

To restore system-wide files from backup, gather your backup diskettes or tapes, making sure you have your last full backup and any incremental backups you've done since the full backup. Arrange the sets of diskettes or tapes in order, with the most recent incremental dump first, and be sure to have the diskettes or tapes for each backup in order. Then select option "4 Restore system-wide files" on the Archive Menu, or issue the keyword SYSRESTORE from any SMI menu. The Restore System-Wide Files screen will appear, as shown in Figure 4-14

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│   SMI Rev. n.nn.nn.nn                    dd-mmm-yy hh:mm       │
│                                                               │
│                                                               │
│                   Restore System-Wide Files                   │
│                                                               │
│   Restore from tape or diskettes? (T = Tape, D = Diskettes)  T│
│                                                               │
│                                                               │
│   Delete existing files with same names as backed-up files,   │
│   or keep the more recent copy? (D = Delete, R = Recent)     R │
│                                                               │
│                                                               │
│   To restore all files, press NEW LINE. To restore specific files, │
│   type the pathnames by which they were backed up, or use templates. │
│   File(s):                                                    │
│                                                               │
│   Send list of restored files to the printer, to a disk       │
│   file, or don't create a list? (P = Printer, F = File,       │
│   N = None)                                                 P │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
│   To exit from any menu, press the Cancel/Exit key (F11).     │
│   For assistance at any time, press the Help key (SHIFT-F1).  │
│                                                               │
└─────────────────────────────────────────────────────────────┘
```

Figure 4-14. Restore System-Wide Files Screen

Note that the default response for each question appears in uppercase letters. To accept any default, just press NEW LINE while at the prompt. Otherwise, type the value you want and press NEW LINE. When all the correct responses are on the screen, press the EXECUTE key (F1) from anywhere on the screen or press NEW LINE at the last question.

The second question asks if you want the system to delete files already on line that have the same names as files on the backup media. The alternative is to have the system compare the time-last-modified on the existing file and the backed-up file, and to keep whichever is newer. For example, suppose the backup media has a file :UDD:SANDY:GUIDELINES, and a file by the same pathname exists on line already. Let's say you specify to keep the more recent copy. The system finds the time-last-modified to be 11-SEP-86 14:11:33 on the backed up version, but 14-OCT-86 10:24:50 on the version on line. In this case, it will keep the on-line version rather than restoring the file from media. Had you specified to delete existing files with the same names as backed up files, it would have restored the 11-SEP-86 version of the file and deleted the version dated 14-OCT-86.

After you specify RECENT or DELETE, the screen prompts you to indicate which files you want restored. To have all files restored, just press NEW LINE. Then tell the system where to send a list of the restored files. If you specify to send the list of restored files to a disk file, you will be prompted for a filename. The default filename will be RESTORE.yy.mm.dd, in the root directory, where yy is two digits for the year, mm is two digits for the month, and dd is two digits for the day of the month. For example

RESTORE.86.12.17

is the default filename for the listing of files restored on December 17, 1986. If you want the listing to display on the console screen, specify @CONSOLE as the filename. *Be sure to look at this listing.* If any errors occur during the file restoration, this file will be the only record of them.

Suppose user Lee, who has the System Manager privilege, is restoring system-wide files from tape. Lee wants the most recent copies of files kept, and wants all files restored, which are the defaults, but wants the list of files restored to go to a disk file in :UDD:LEE called SYSTEM_RESTORE. Lee would fill in the screen as shown in Figure 4-15.

```
SMI Rev n.nn.nn.nn                            dd-mmm-yy hh:mm


                    Restore System-Wide Files


    Restore from tape or diskettes? (T = Tape, D = Diskettes)     TAPE


    Delete existing files with same names as backed-up files,
    or keep the most recent copy? (D = Delete, R = Recent)        RECENT


    To restore all files, press NEW LINE. To restore specific files,
    type the pathnames by which they were backed up, or use templates.
    File(s):


    Send list of restored files to the printer, to a disk
    file, or don't create a list? (P = Printer, F = File,
    N = None)                                                     FILE
    Filename: :UDD:LEE:SYSTEM_RESTORE




    To exit from any menu, press the Cancel/Exit key (F11).
    For assistance at any time, press the Help key (SHIFT-F1).
```

Figure 4-15. Sample Restore System-Wide Files Screen

Note that the "Filename:" prompt appeared after Lee entered F to indicate a disk file for the list of restored files.

When you have answered all questions and prompts, press NEW LINE at the last prompt or press the Execute key (F1) from anywhere on the screen. The next two sections cover restoration of system-wide files from diskettes and tape, respectively.

Restoring System-Wide Files from Diskettes

To restore system-wide files from diskettes, locate your most recent full backup and any incremental backups taken since the full backup. Arrange the diskettes in the correct order: the most recent incremental backup first, next most recent next, and so on, with the full backup last. Then use the following steps. (Note that all italicized text in the first column is system output.)

System Message or Action	Your Action
	Insert VOL01 of the most recent incremental backup in the diskette drive.
*** Restoration within directory : at hh:mm:ss on dd-mmm-yy *** *Please insert the first diskette of the backup fileset.* *Insert the fileset diskettes - when prompted - in the order in which they were originally dumped.* *-- Beginning file restoration --* *Please insert a diskette if not already inserted.* *Unit [@DPJ10] Volume ID [VOL01]? [y]*	You already have a diskette inserted. Press NEW LINE to start file restoration.
(The system copies the files from the diskette onto the disk. When it has finished with the first diskette, it prompts you for the next:)	
Please insert next diskette *Unit [@DPJ10] Volume ID [VOL02]? [y]*	Remove the first diskette from the diskette drive and insert VOL02. Press NEW LINE. Repeat this procedure when prompted until you have used all the diskettes in the backup set.
(When the restoration is complete, the system will display this message:)	
*** Restoration of directory : complete at hh:mm:ss ***	Remove the last diskette from the drive. Store the set of diskettes in a safe place. Save them until you make at least one more full backup.

Restoring System-Wide Files from Tape

To restore system-wide files from tape, collect your set of backup tapes from the most recent full backup, and any incremental sets you've done since then. Arrange the tapes in order, placing the most recent incremental backup first and the full backup last. Be sure the tapes in each set are in the correct order (beginning with tape volume 1). Then, after you've filled out the Restore System-Wide Files screen, proceed as follows. (Note that all italicized text in the first column is system output.)

System Message or Action	Your Action
(The SMI displays the following message:)	
Please mount or insert the first tape, if not already done. *Press NEW LINE when ready.*	
	Insert or mount the first tape in the backup set. When the tape is inserted or mounted correctly, press NEW LINE.
(The system will begin to copy the system-wide files from the tape to the disk. When it has copied all files on the tape, the SMI will make the terminal beep and display the following message:)	
Remove the tape from the drive and mount or insert volume VOL02. *Press NEW LINE when ready to continue.*	
	Remove the first tape and insert the second, as prompted. Press NEW LINE to signal the system to resume copying files to the disk.
(The system will continue to copy files from the tape to the disk until all files have been copied. It will then prompt you for the next tape, and the same procedure will repeat until you have loaded files from all your backup tapes. When all files have been loaded, the system will output the following message:)	
The restoration is complete. Please remove the last tape from the drive. *Press NEW LINE when ready to continue.*	
	Remove the last tape and press NEW LINE.
(The SMI will redisplay the Archive Menu.)	

If you want to do backups other than the types described in this chapter, you will have to use the CLI and run the programs DUMP_II and LOAD_II. Refer to *How to Generate and Run AOS/VS* for information.

End of Chapter

Chapter 5
Performing Advanced Functions

This chapter is for the

System Manager	✓
System User	☐

This chapter describes some advanced technical functions you can perform as System Manager. During the powerup sequence on MV/2000 DC and DS/7000-series systems, several advanced functions are available through the Change Preset Values Menu and the Technical Maintenance Menu. (We caution you against attempting to perform any of these functions without first reading the appropriate section of this chapter *and* making certain that you have any other necessary documentation noted in that section.)

Along with the advanced functions you can perform during powerup, this chapter describes how to monitor disk space in order to optimize system performance.

The Change Preset Values Menu

The Change Preset Values Menu options allow you to change certain attributes of your system, affecting both powerup and normal system operation. The menu is pictured in Figure 5-1.

```
                        Change Preset Values Menu

      1  Continue the powerup
      2  Change the system date or time
      3  Start from a different device
      4  Change the default device
      5  Change the time-out delay for the Automatic Program Load Menu
      6  Enter the SCP CLI
      7  Change the system console
      8  Select diagnostics sequence
      9  Configure parallel printer port


      For assistance, press the Help key (SHIFT-F1) or H
      To exit from this menu, press the Cancel/Exit key (F11) or ESC


      Enter choice [1]:
```

Figure 5-1. Change Preset Values Menu

Getting to the Change Preset Values Menu

You can get to the Change Preset Values Menu only during the early stages of powerup. When you receive the Automatic Program Load Menu – the first powerup menu (described in Chapter 2) – select option "2 Change preset values," which will interrupt the normal startup sequence and present the Change Preset Values Menu.

Returning to the Regular Powerup Path

Should you get to the Change Preset Values Menu and decide you really do not want to be there, option "1 Continue the powerup" lets you return to the normal startup sequence. Or after you perform whatever functions you needed from the Change Preset Values Menu, you can return to the powerup path via option 1.

Similarly, you can press Cancel/Exit (F11) or ESC from the Change Preset Values Menu and you will return to the normal powerup path.

Changing the Date or Time

There are two places from which you can change the computer's internal clock and calendar, other than in the SMI program. One is an option on the Starter Main Menu, which you will see later in the powerup. The other is at the Change Preset Values Menu. The option is available in both places so that if the Starter program is already running when you want to change the date or time you don't have to power down the system in order to fix it. Similarly, if Starter is not running, you need not start it up in order to set the date and time.

It doesn't matter from which place you choose to set the date and time; but it is easier to make the change from the Starter Main Menu for two reasons. First, you don't have to leave the normal startup path and descend to another level of menus to do it, as you do when using the Change Preset Values Menu; second, the prompts for setting the date and time are more explanatory and you have more detailed Help messages available with the Starter program. We recommend that you wait until you reach the Starter Main Menu to change the date and time, unless you are already very familiar with the system.

To set or change the date and/or time from the Change Preset Values Menu, select option "2 Change the system date or time" by typing 2 and pressing NEW LINE. You will receive prompts for the information the system needs. The default choices will appear in brackets. Below, we show the format in which you must enter your responses. Normally, the default reponses will appear in the brackets.

Date [DD-MMM-YY]:

Time [HH:MM:SS]:

Offset to GMT [+0:00]:

For the date, you must use the format DD-MMM-YY, where DD represents two numeric digits for the day of the month, MMM represents the three letters of the month name, and YY represents two digits for the year. Enter the time in hours, minutes, and seconds, using 24-hour format. If you omit minutes or seconds, the system will assume zeros.

The third prompt asks for your offset to Greenwich Mean Time (GMT). This value is used by some operating systems when computer systems are part of a network that spans time zones. AOS/VS does not use the GMT offset value; therefore, you can just press NEW LINE at this prompt.

If you might use an operating system other than AOS/VS on your computer, ask your network administrator if you will need to enter a GMT offset. If you do, figure your offset as follows. The offset value is the number of hours (and minutes, if necessary) to add to local time to equal GMT. Be sure to enter the offset with the correct sign, + or − (note that if you omit the sign, the system assumes +).

For example, suppose it is 10:12 a.m. on Monday, September 15, 1986, and Daylight Savings Time is in effect. Dale, in Los Angeles, has been instructed by the network administrator to enter a value for the GMT offset. Dale would answer the prompts as follows:

Date [01-JAN-68]: 15-SEP-86)

Time [00:00:00]: 10:12)

Offset to GMT [+0:00]: +8)

When you have responded to all three prompts, you will return to the Change Preset Values Menu.

Switching to a Different Type of Media

For a normal powerup, the MV/2000 DC or DS/7000-series system assumes that AOS/VS is located on your hard disk, and this is where it will look for the appropriate programs. If you are loading a different operating system or the Advanced Diagnostic Executive System (ADES) diagnostics, or loading AOS/VS from another medium, such as diskettes or cartridge tape, you will have to tell the system this by specifying the correct option on the Change Preset Values Menu.

If normally you will be loading the operating system from the hard disk, but just need to specify a different medium for this powerup, you will select option "3 Start from a different device." On future powerups, the system will return to loading from the disk. However, if you always will be loading from a different medium, you will want to select a different default device (the default device is the one automatically used unless another is specified). To change the default, select option "4 Change the default device." If you change the default device from the hard disk to something else, you can change it back to the hard disk on any subsequent powerup.
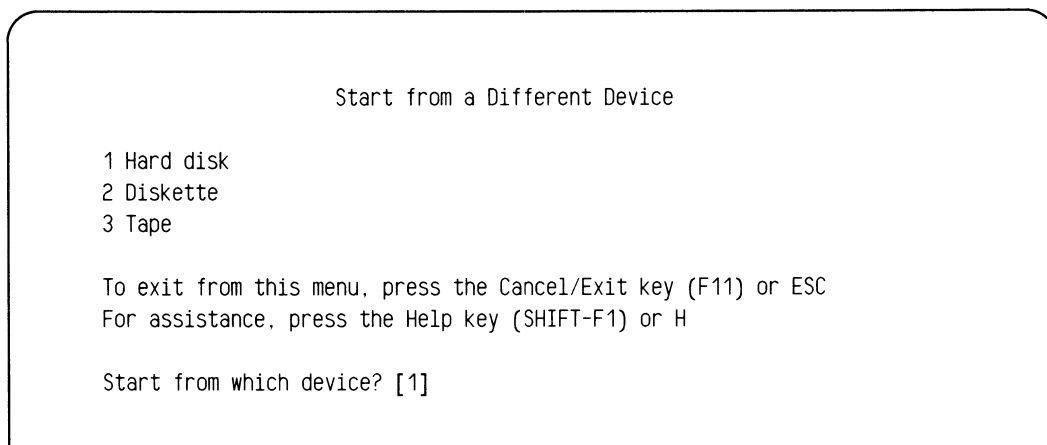
NOTE: If you are going to select either option 3 or 4, be sure you have your tape mounted or diskette inserted and ready before you specify the device you want to start from. Be sure the READY light on the device is lit, if applicable.

Note that the default device name appears near the bottom of the Automatic Program Load Menu, so you can always tell at a glance what the default device is.

Starting from a Different Device

You will want to start from a different device if the programs you want to run for this powerup are on a type of media different from the default. For example, if you have purchased ADES diagnostics (as part of a service contract) and want either to run them or to install them on your disk, you will select option "3 Start from a different device." Note that, if you have these diagnostics, we recommend that you install them on the disk. The procedure is very easy, and then the diagnostic programs will run automatically every time you power up, as long as your default device is the hard disk.

When you select option 3, you will see the screen shown in Figure 5-2.

```
                    Start from a Different Device


   1 Hard disk
   2 Diskette
   3 Tape


   To exit from this menu, press the Cancel/Exit key (F11) or ESC
   For assistance, press the Help key (SHIFT-F1) or H


   Start from which device? [1]
```

Figure 5-2. Start from a Different Device Screen
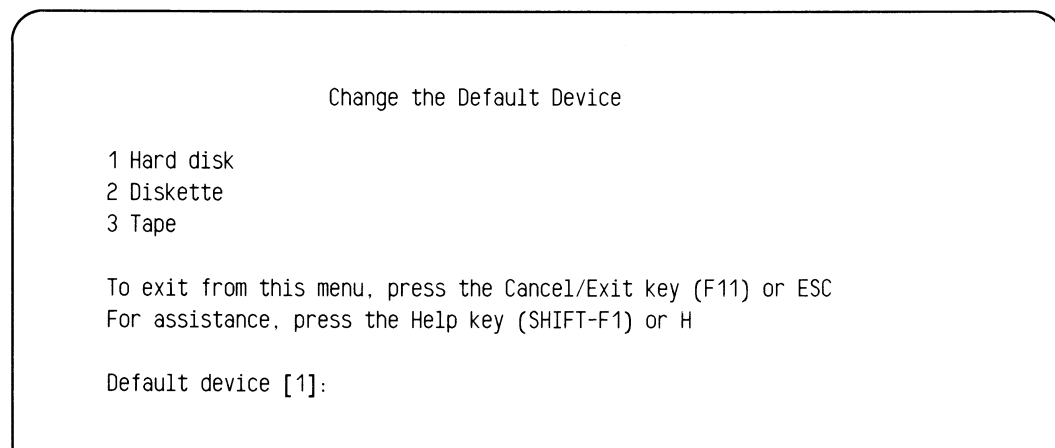
Before you specify your choice, be sure you have a tape mounted or diskette inserted and ready on the appropriate drive. If you are running or installing ADES, be sure you have the first ADES diskette or the ADES tape inserted. Then enter the number of the type of device you want to start up from. The default is option "1 Hard disk."

When you have entered your choice, the selected device immediately starts up. If the medium you are starting from is an ADES tape or diskette, you will receive the option to install ADES on your disk. *We recommend that you do this.* Once ADES is installed, you can run its programs on subsequent powerups just by selecting a menu option on the Technical Maintenance Menu, as described later in this chapter.

If you want to install ADES, select the appropriate option. If you just want to run ADES from the tape or diskette, select whichever menu option(s) you want.

Changing the Default Device

If you opt to change the default device by selecting option "4 Change the default device" on the Change Preset Values Menu, you will receive the screen shown in Figure 5-3.

```
                     Change the Default Device


    1 Hard disk
    2 Diskette
    3 Tape


    To exit from this menu, press the Cancel/Exit key (F11) or ESC
    For assistance, press the Help key (SHIFT-F1) or H


    Default device [1]:
```

Figure 5-3. Change the Default Device Screen

Before you specify which device you want, be sure you have a diskette or tape mounted and ready on the appropriate device. Type the number of the device you want for the default startup device; then press NEW LINE. You will return to the Change Preset Values Menu. Note that the device you specify will become the default for this startup and subsequent startups.

Changing the Time-Out Delay

Option "5 Change the time-out delay for the Automatic Program Load Menu" on the Change Preset Values Menu lets you change the amount of time the Automatic Program Load Menu will wait before it continues automatically if you don't respond. The default is 45 seconds; you can change this value to any whole number of seconds between 10 and 45.

You will receive the following prompt:

Time-out delay (in seconds) for the Automatic Program Load Menu [45]:

Type the number you want and press NEW LINE. You will return to the Change Preset Values Menu. The new time-out value will be in effect the next time you power up the system.

Entering the System Control Program CLI (SCP CLI)

Option "6 Enter the SCP CLI" on the Change Preset Values Menu allows you to enter the System Control Program's CLI. *Do not select this option unless you are familiar with the SCP CLI and have the proper documentation handy.* This option is available mainly for your service representative's benefit and we recommend that you avoid choosing it. Should you select this option by mistake and enter the SCP CLI, you will see the following prompt on your screen:

SCP-CLI>

Don't panic if this happens. Just type the SCP command CONTINUE next to the prompt and press NEW LINE, as follows:

SCP-CLI> CONTINUE ⏎

The SCP will place you back in the Change Preset Values Menu.

Changing the System Console

To change the system console, you must have a DS/7000-series computer with a system board and a video memory board. Each board must have a terminal cabled to it.

Select option "7 Change the system console" on the Change Preset Values Menu. The screen shown in Figure 5-4 will appear.

```
                    Change System Console

1 System Board
2 Video Memory Board


To exit from this menu, press the Cancel/Exit key (F11) or ESC
For assistance, press the Help key (SHIFT-F1) or H

System console on which board? [1]
```
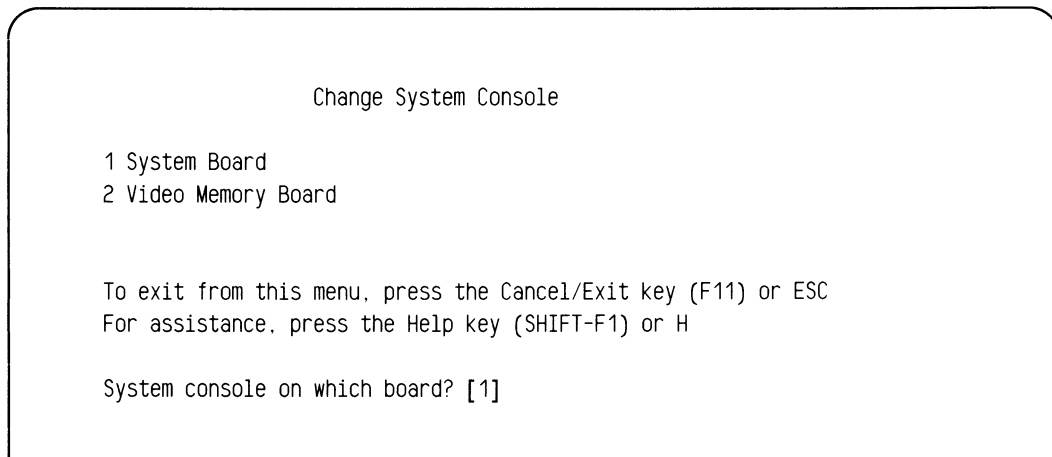
Figure 5-4. Change System Console Screen

Enter the number for the board that is cabled to the terminal you want to use for the system console, or press the Cancel/Exit key or ESC if you decide not to change the system console after all. The system will return you to the Change Preset Values Menu. The system console you specified will be the system console the next time you power up.

Selecting the Diagnostics Sequence

The diagnostics that run when you power up are important; they ensure that your system hardware is functioning properly. The full set of diagnostics takes about a minute and a half to run. The Change Preset Values Menu offers the option of selecting an abbreviated diagnostics sequence to run for subsequent powerups.

The abbreviated set of diagnostics shortens standard powerup tests slightly, and eliminates testing of the system board (or processor) for systems that have ADES installed. The abbreviated set of powerup diagnostics should take just under a minute to run. For those users who haven't purchased a service contract, and therefore haven't received ADES, the difference between abbreviated and regular diagnostics is only about half a minute; in this case, running abbreviated diagnostics is probably not a great savings.

For systems with ADES, eliminating the diagnostic tests on the system board should save about 2 or 3 minutes of testing time. Although the abbreviated set of diagnostics is available to you, we recommend that you run full diagnostics on every powerup. The assurance that the processor is functioning normally is probably worth the couple of minutes it takes to run the tests. And the tests run without any attention from you; you can attend to something else while they proceed.

If you do choose to change the default diagnostics sequence, choose option "8 Select diagnostics sequence" of the Change Preset Values Menu. The screen shown in Figure 5-5 will be displayed.

```
Select Diagnostics Sequence

1 Run full diagnostics
2 Run abbreviated diagnostics

To exit from this menu, press the Cancel/Exit key (F11) or ESC
For assistance, press the Help key (SHIFT-F1) or H




Enter choice [1]:
```

Figure 5-5. Select Diagnostics Sequence Screen

Enter the number of the diagnostics sequence you want to run for subsequent powerups. Remember that you can change the selected diagnostics sequence any time you power up, via the Change Preset Values Menu; but the sequence you select will not take effect until you shut down and then start up the system again.

Once you have selected a diagnostics sequence, the system will return you to the Change Preset Values Menu.

Configuring the Parallel Printer Port

Option "9 Configure parallel printer port" on the Change Preset Values Menu lets you specify the strobe type for the printer that is attached to your parallel printer port. Depending on your printer, you will have to specify either positive or negative strobe. In addition, you can specify whether or not your printer has a Vertical Forms Unit (VFU) and/or tab memory.

NOTE: A VFU permits the printer to handle a variety of form lengths and rapid manipulating within a form while under control of a program. You can use the FCU utility to make VFU specifications. See the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)* for information.

Table 5-1 specifies the correct strobe type for the printers usable on the ECLIPSE MV/2000 DC and DS/7000-series systems, and whether or not each printer has a VFU and tab memory. If your printer's model number is not listed here, refer to the manual that came with your printer to determine which settings to use.

Table 5-1. Parallel Printer Port Settings

Model Number	Strobe Type	VFU Option	Tab Memory
4323	Positive	Yes	Yes
4324	Positive	Yes	Yes
4365	Positive	Yes	Yes
4366	Positive	Yes	Yes
4374	Positive	Yes	Yes
6216	Positive	No	Yes

Note that if your parallel printer has the incorrect strobe value set, it won't work; but the system will not be able to determine that the value is incorrect. *Be sure you set the strobe value correctly.* If you have the VFU option set incorrectly, your printer will work, but the VFU (if present) will not. The same applies for tab memory.

The default value for this setting is positive strobe with VFU and tab memory. If this value is correct for your printer type, you won't need to use this option. If you do need to configure your port, select option "9 Configure parallel printer port" on the Change Preset Values Menu. The menu shown in Figure 5-6 will appear.

```
                        Configure Parallel Printer Port


        1 Positive strobe, VFU option, tab memory
        2 Positive strobe, no VFU option, tab memory
        3 Positive strobe, no VFU option, no tab memory
        4 Negative strobe, VFU option, tab memory
        5 Negative strobe, no VFU option, tab memory
        6 Negative strobe, no VFU option, no tab memory


        To exit from this menu, press the Cancel/Exit key (F11) or ESC
        For assistance, press the Help key (SHIFT-F1) or H




        Enter choice [1]:
```

Figure 5-6. Configure Parallel Printer Port Menu

Select the option that is appropriate for your printer. Type its number and press NEW LINE. You will return to the Change Preset Values Menu.

The Technical Maintenance Menu

You will use the Technical Maintenance Menu only if you need to perform one of the following advanced functions:

- Load and verify microcode.

- Enter the SCP CLI.

- Change the time-out delay for the Operating System Load Menu.

- Run ADES diagnostics.

This menu is called the Technical Maintenance Menu because its options allow you to perform more technical functions than do other system menus. You should use this menu only if you are familiar with the operation you want to perform. Be sure to have the appropriate documentation on hand.

The number of options on the Technical Maintenance Menu will vary, depending on whether or not you have purchased a service contract (which comes with ADES diagnostics). If you have these diagnostics, the menu will look like the one pictured in Figure 5-7. Otherwise, the Technical Maintenance Menu will not have option "5 Run diagnostics."

```
                         Technical Maintenance Menu

         1 Load and start the default operating system
         2 Load and verify microcode
         3 Enter the SCP CLI
         4 Change the time-out delay
         5 Run diagnostics


         For assistance, press the Help key (SHIFT-F1) or H


         Enter choice [1]:
```
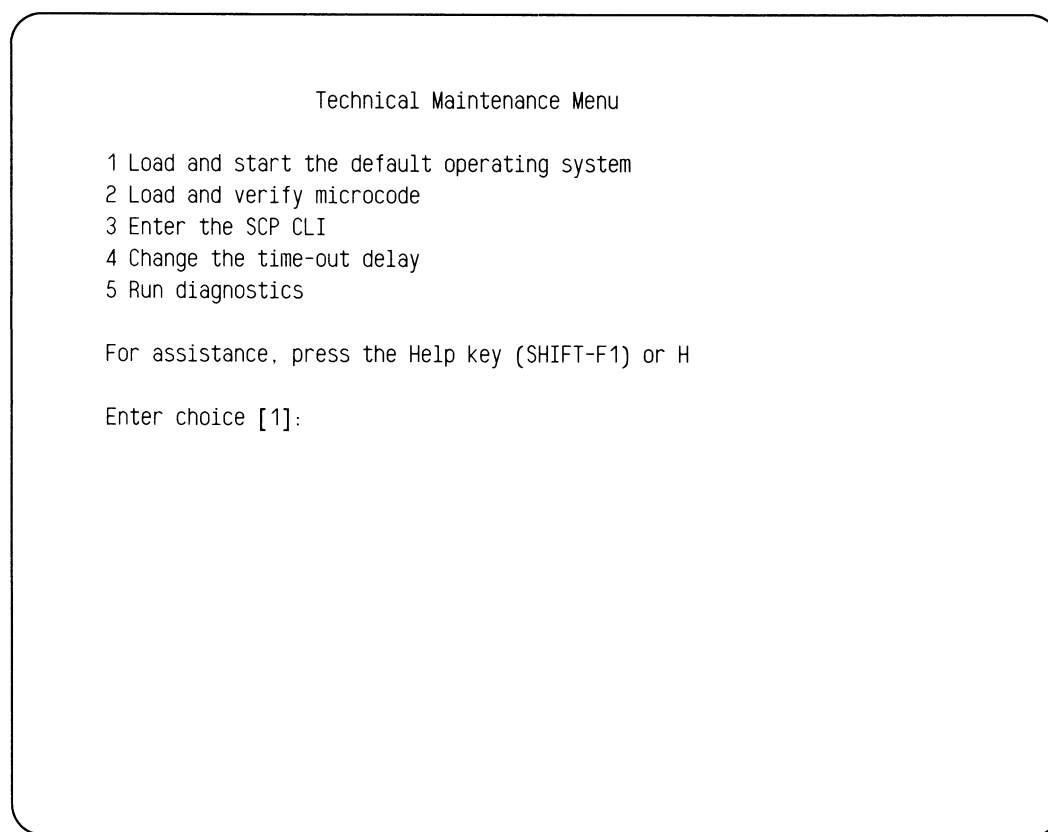
Figure 5-7. Technical Maintenance Menu

If an option on the Technical Maintenance Menu that you select causes an error condition, the menu will redisplay, and the error condition will appear on the line between the "For assistance..." line and the "Enter choice [1]:" prompt. See Chapter 7 for an explanation of the errors that are possible from this menu.

Getting to the Technical Maintenance Menu

You can get to the Technical Maintenance Menu only during powerup, before the operating system starts up. To do so, select option "2 Enter the Technical Maintenance Menu" on the Operating System Load Menu (described in Chapter 2). The automatic powerup will be interrupted and the Technical Maintenance Menu will appear on your screen.

Returning to the Regular Powerup Path

To continue the normal powerup from the Technical Maintenance Menu, select option "1 Load and start the default operating system." The powerup will continue, and soon you will receive the Starter program's Main Menu.

Loading and Verifying Microcode

Option "2 Load and verify microcode" on the Technical Maintenance Menu lets you load microcode onto your system. You may need to do this if you plan to run an operating system other than the one that is the default on your hard disk; you might have to load the microcode for the system you want to run.

When you select option 2, the system attempts to find a microcode file on the disk and load it into the computer's memory. If the system finds the file, it will load it and return you to the Technical Maintenance Menu. If it cannot find such a file, it will send you the following message:

Microcode file does not exist.

Entering the System Control Program CLI (SCP CLI)   *

Option "3 Enter the SCP CLI" on the Technical Maintenance Menu allows you to enter the System Control Program's CLI. *Do not select this option unless you are familiar with the SCP CLI and have the proper documentation handy.* This option is available mainly for your service representative's benefit and we recommend that you avoid choosing it. Should you select this option by mistake and enter the SCP CLI, you will see the following prompt on your screen:

SCP-CLI>

Don't panic if this happens. Just type the SCP command CONTINUE next to the prompt and press NEW LINE. For example

SCP-CLI>   CONTINUE)

The SCP will place you back in the Technical Maintenance Menu.

Change the Time-Out Delay

Option "4 Change the time-out delay" on the Technical Maintenance Menu lets you change the number of seconds the Operating System Load Menu will pause before continuing automatically if you don't respond to it. When you select this option, you will receive the following prompt:

Number of seconds to wait before loading the operating system [45]:

Enter a number between 10 and 45. This time-out interval will be in effect the next time you power up the system. The same interval will also apply to the Starter Main Menu, which comes up after the Operating System Load Menu during powerup if you specify to load and start the default operating system.

Running ADES Diagnostics

The Advanced Diagnostic Executive System (ADES) is a small operating system with a set of diagnostic test programs. These tests are separate from the powerup diagnostic programs that run when you start up your MV/2000 DC or DS/7000-series system. The powerup diagnostic programs are a limited set of ADES diagnostic programs. You can optionally receive the complete ADES product separately by purchasing a service contract. ADES is an extensive diagnostics system that is able to isolate faults in the system to certain Field Replaceable Units (FRUs), so that your Field Engineer can easily replace a defective part.

If you have received the complete ADES, and have installed it on your system (as described in the "Start from a Different Device" section of this chapter and *Installing and Running Co-resident Diagnostics on the ECLIPSE MV/2000™ DC and DS/7000-Series Workstations*), you can select option "5 Run diagnostics" on the Technical Maintenance Menu.

When you select this option, the system will send you the following message:

Are you sure you want to boot diagnostics? [N]:

Since running diagnostics can be an involved process, this prompt allows you to change your mind. If you still want to run diagnostics, type Y and press NEW LINE. Otherwise, just press NEW LINE and the Technical Maintenance Menu will redisplay.

If it is your first time running ADES, the program will prompt you to describe your system. It will prompt you for information such as your system type (MV/2000 DC, DS/7500, or DS/7700), system memory size, type of parallel printer, numbers and types of option cards (boards), and so on. On subsequent times running ADES, the program will present your "Current Inventory List," showing what you specified when you previously described your system. It will then allow you to change anything that is incorrect. When you have specified that the list is accurate, the diagnostic system presents the ADES Main Menu.

For more information on ADES, see the *ADES Operator's Manual* or *Installing and Running Co-resident Diagnostics on the ECLIPSE MV/2000(TM) DC and DS/7000-Series Workstations*.

Disk Space and Performance

As system manager, you can take certain steps to ensure that system performance is as good as it can be. By monitoring the amount of available space on your disk, you can prevent unnecessary slowdowns on your system.

Before attempting to use the information in this section to monitor disk space, you should be familiar with the CLI, the command language used with AOS/VS. For a good introduction to the CLI, see *Learning to Use Your AOS/VS System* or the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)*.

Overall Free Space

The amount of free disk space usually affects performance more than any other factor. When more than 70 percent of your disk is in use, the system must spend significantly more time seeking over the disk to find free space whenever someone creates a file. When the disk is above 70 percent full, the access time needed rises steeply. Much above 70 percent, everyone on the system may note increased response time; that is, it takes longer for the system to respond after a user issues a request. If more than 95 percent of your disk is used, you should take immediate action to free some space.

The most convenient way to handle the space factor is by limiting each user's space in his or her PREDITOR profile. The standard profiles that come with AOS/VS — System Manager and System User — have 25,000 disk blocks. If you need to increase or decrease this amount for any of your users, use PREDITOR, the profile editor. PREDITOR is described in *How to Generate and Run AOS/VS*.

If disk space is tight, and you don't want to acquire another disk unit just now, you can ask users to delete all their old files, and any that have the suffix .ST. Temporary files and break files (suffixes .TM, .TMP, and .BRK) can also be deleted; so can backup files (.BU suffix) after the file system is backed up. Having users delete files they don't need can open up a considerable amount of space.

There may also be obsolete files in :UTIL, and obsolete user directories in :UDD. You can simply delete the former via the CLI. You should dump the latter for the record; then use SMI's Manage User Profiles Menu to delete both the obsolete profile and user directory.

Checking How Much Space Is Being Used

Use the CLI command SPACE with a control-point directory name to check the number of disk blocks used and remaining in that directory. Or to find this information for the root directory, issue the keyword SPACE from any SMI menu. For example, suppose you have a 70-Mbyte disk and want to see how much space is being used. You would enter SPACE while at an SMI menu, as follows:

Enter choice: SPACE)

Or you can issue the following CLI command:

) SPACE :)

The system's response will look something like this:

MAX   130482, CURR   91085, REM   39197

From this response you can see that less than 70 percent of the blocks are used.

Suppose some time passes, and you issue the SPACE command again, from the CLI, for example.

) SPACE :)
MAX   130482, CURR   110918, REM   19564

Now you can see that about 85 percent of the blocks are used. It is time to get users to clean up. After they delete unneeded files, you issue the SPACE command once more.

) SPACE :)
MAX   130482, CURR   89238, REM   41244

That's better; less than 70 percent of the blocks are used.

File Fragmentation

Another way in which system performance can be degraded is by file fragmentation. Each AOS/VS file has one or more *data elements*. (An element is, by default, four disk blocks, but anyone can specify many more blocks — creating a file with many contiguous blocks — with the CLI CREATE command and /ELEMENTSIZE switch.)

As a disk begins to fill up, files become fragmented; that is, different parts of the same file are scattered throughout the disk. AOS/VS must search farther on the disk to find existing parts of the file or empty space to put new parts of the file in. The more time AOS/VS spends searching in this manner, the more the system slows down.

File fragmentation often occurs when a disk is nearly full. Simply deleting files, as described in the previous section, may or may not eliminate it. If cleaning up the disk doesn't seem to help your system's performance, you can suspect fragmentation. Or you can use the DISCO program, described in the next section, to see if fragmentation is occurring.

The DISCO Disk Monitoring Program

The DISCO disk monitoring program keeps track of disk activity and reports various statistics in a table format. One of these statistics, "Average Seek," can help you to determine if you have a fragmentation problem.

To run DISCO, you can execute it from the CLI. Use the following command line:

) XEQ DISCO)

You can also run DISCO from the SMI program by selecting option "1 Run a program or application" on the SMI Main Menu or specifying the PROGRAM keyword. You would then type the same command line as above, in response to the prompt; that is

Enter a CLI command line or a macro name, or press NEW LINE to enter the CLI:
XEQ DISCO)

Note that you must have the "Change process type" privilege in your user profile in order to run DISCO. All profiles created by SMI contain this privilege.

When DISCO starts to run, you will see the first DISCO screen. The table will contain one line for each disk you have, therefore it will have either one or two lines. All of the statistics this screen reports are total figures since system startup. Pressing the Z key at any time zeros the figures and restarts them. Figure 5-8 is a sample of what the first DISCO screen might look like on an MV/2000 DC or DS/7000-series system that has two disks.

```
Apr 7,1986                    AOS/VS DISC MOnitor Program                  9:47:41


                                                     Function key #11 to Exit


Actual time   8.9 seconds                              Cycle time  10 seconds
   U
D  n                                                            Avg   Avg
e  i  # of  % of   % of  % of Avg/Max Avg Blocks Blocks  % of  Serv  Resp
v  t Reqs  Total  Busy  Intf Queue  Seek Read   Written Util  Time  Time


24 0 38714 76.4   36.4  0.0  0.6 09  84.1 64034  63866   12   .034  .034
24 1 13430 23.6    9.7  0.0  0.1 05  44.8 42830  39536    4   .013  .010
```

Figure 5-8. Sample First DISCO Screen

The second DISCO screen, which you can view by typing S from the first screen, shows statistics for the last *cycle* only. Each cycle is, by default, 10 seconds. Type S again to return to the first DISCO screen.

Since we are dealing only with disk fragmentation here, you need only be concerned with the column headed "Avg Seek." The value in this column is the average number of cylinders on the disk that the read/write heads had to seek over to perform a read or write command.

The seek distance indicates two important things: the amount of available disk space and the amount of file fragmentation. Large figures show a relatively full disk and/or a high level of fragmentation. If you are concerned about system performance, it might be a good idea to keep track of the Average Seek value. Run DISCO when you first bring up the system, get the initial Average Seek figure, and write it down. Then you can check the value periodically and you will have your initial value to use for comparison. If you see the Average Seek value steadily growing over time, your disk files are probably fragmented. If this is degrading your system's performance, you might want to consider rebuilding your disk to reduce fragmentation.

To exit from DISCO at any time, press the Cancel/Exit key (F11). For more information about the DISCO disk monitoring program, see the description in *How to Generate and Run AOS/VS*.

Reducing Fragmentation

To minimize or eliminate fragmentation, first have all users delete unnecessary files, as described earlier. Then back up all files from the disk onto diskettes or tape. (Note that, if possible on your system, it is preferable to use tape, since a full dump could take as many as 50 or more diskettes.) We described how to perform a full system-wide backup in Chapter 4.

Next, bring the system down and rebuild the disk using option "1 Build the disk," of the Starter program's Build or Update System Disk Menu, as described in Appendix A. Finally, restore the system-wide files onto the disk using the SMI program and see if performance picks up. It usually will.

NOTE: Rebuilding the disk destroys everything on the disk. Be absolutely certain that your backup is valid by verifying the dump *before* you rebuild the disk. If you rebuild the disk and discover your backup is no good, you will have no way to restore your files.

End of Chapter

Chapter 6
Communicating with Another System

This chapter is for the

System Manager ☑

System User ☐

The XODIAC Network Management System

The XODIAC network management system is a set of software products that allows your MV/2000 DC or DS/7000-series system to communicate with other computer systems in a network. The systems can then share resources and exchange data. All other systems in the network must also be running XODIAC software.

XODIAC is necessary for a centralized CEO system, in order to make CEO Mail and CEO Calendar generally accessible; but CEO makes XODIAC invisible to the user. XODIAC also allows you to log on to a remote host as if it were your own system. In the networking context, the word *local* refers to your own computer system, while *remote* refers to another system in the network to which you are connected.

Table 6-1 describes the XODIAC products.

Table 6-1. The XODIAC Products

Product	What it Does
XODIAC Transport Service (XTS)	Establishes and maintains a connection between two remote hosts. XTS also packages user data into packets and sends and receives the packets across the network. The XTS process implements the international standard access protocol known as X.25. It connects your system to any public or private network that follows the X.25 protocol.
Resource Management Agent (RMA)	Lets users access files, queues, devices, and processes on a remote AOS or AOS/VS system.
Virtual Terminal Agent (VTA)	Allows users to log on to a remote system.
File Transfer Agent (FTA)	Allows fast file transfer across a network.
Remote INFOS Agent (RIA)	Provides access to INFOS II files on another system.
Remote Database Agent (RDA)	Provides access to DG/DBMS databases on another system.

You will find complete information on XODIAC in the following manuals: *Using the XODIAC™ Network Management System*, *Managing and Operating the XODIAC™ Network Management System*, and *Programming with the XODIAC™ Network Management System*. In this chapter, we will introduce you to using the network with XODIAC and tell you how to get started using XODIAC on MV/2000 DC and DS/7000-series systems.

Prerequisites for Running XODIAC

For your MV/2000 DC or DS/7000-series system to communicate with another system, it must have *communications hardware*. Communications boards are options you can purchase for these systems. There must also be a connection between the systems — a direct wire or a phone line. The phone line is connected to the other system via a modem (also called a data set). When using a modem, you dial the other system's number on a phone, wait for the appropriate tone, and then make the modem connection.

Your system must also be running XODIAC. You can install XODIAC via SMI by selecting option "2 Install software" on the Customize the System Menu (described in Chapter 3, "Managing the System"). Your system must also use NETGEN to configure the hardware and the remote host.

Finally, your system's UP and DOWN macros must bring the network up and down, and enable and disable virtual consoles. The UP macro that comes with AOS/VS for MV/2000 DC and DS/7000-series systems brings up the network every time the system comes up, with the following line:

:UP.NETWORK

This line executes the macro :UP.NETWORK.CLI, which comes with XODIAC software. Note that the UP macro brings up the network before bringing up INFOS II and CEO. It also enables all consoles.

The :UP.NETWORK.CLI macro also starts a log file for each network product. If anything goes wrong with the network, these log files can help identify the problem. You should keep an eye on these log files, even if there aren't any problems, because they can grow quite large and numerous, and waste a lot of disk space.

The network log files are all located in the directory :NET:LOGFILES and have filenames of the format product_month_day_year.LOG; for example, the log file for the product XTS on May 19, 1986 would be XTS_5_19_86.LOG. Periodically, you will probably want to go into the :NET:LOGFILES directory and delete the old log files.

Your system's DOWN macro includes the following line to bring down the network:

:DOWN.NETWORK

This line executes the :DOWN:NETWORK.CLI macro, which comes with XODIAC software. Note that the DOWN macro brings down the network after bringing down CEO and INFOS II.

Managing and Operating the XODIAC™ Network Management System discusses the UP.NETWORK.CLI and DOWN.NETWORK.CLI macros. You will also have to edit these macros before using them on your system.

Network Tasks for the System Manager

Every network should have a network administrator. The network administrator must make sure that every system on the network has compatible values for certain parameters. As system manager for one or more systems on the network, you might have to assume the tasks of managing and/or operating the network, and follow directions that the network administrator passes on.

Your task as network manager/operator for your system largely consists of the following:

- Installing the network software.

- Understanding the mapping of the network; that is, knowing where all the devices and links are in relation to each other.

- Determining which users need access to the network or to any network process.

- Running the NETGEN program to configure the local system's software and hardware for the XODIAC network.

- Making any necessary configuration changes with NETGEN.

- Creating the network processes (NETOP, XTS, FTA, VTA, RMA).

- Bringing the network up and down, when necessary.

- Starting and restarting the network processes.

- Terminating the network processes when necessary.

- Controlling the individual network processes through NETOP.

- Performing troubleshooting functions if something goes wrong with the network.

Managing and Operating the XODIAC™ Network Management System describes how to do all of these tasks. You should be familiar with the CLI before trying to manage the network. See the *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)* for an introduction to the CLI.

End of Chapter

Chapter 7
What if Something Goes Wrong?

The first part of this chapter is for the

System Manager   ☑

System User   ☑

We have designed the MV/2000 DC and DS/7000-series systems to be as trouble-free as possible. However, with any computer system, there exists the possibility of error situations. This chapter will help you to deal with error conditions and instruct you how to remedy them.

This chapter is divided into the following major sections:

- Starter, SMI, and Related Error Messages.

- Powerup Problems.

- Errors at the Operating System Load and Technical Maintenance Menus.

- Disk Abnormalities Detected by Starter.

- Starter Panics.

- Abnormal System Shutdowns.

We discuss the Starter and SMI error messages first because the SMI messages apply to all system users. The rest of this chapter contains information for the system manager only.

Starter, SMI, and Related Error Messages

This section lists and describes the error messages displayed by the Starter and SMI programs themselves, and by programs that load Starter and AOS/VS if you have to reload them from the disk. In addition to or instead of these messages, you might receive some AOS/VS, CLI, or EXEC error messages, depending on what you are doing. Because these messages are the same on MV/2000 DC and DS/7000-series systems as they are on other computers, we have included only the most common ones in this manual. See the manuals *How to Generate and Run AOS/VS* and *Command Line Interpreter (CLI) User's Manual (AOS and AOS/VS)* for descriptions of AOS/VS, CLI, and EXEC error messages.

Each Starter and SMI message that we list here will show up on the screen of whichever user caused the error or status condition. Other messages, however, might appear on the system console instead. For example, messages from the EXEC process and device errors will display on the system console. When this happens, the person using the system console will have to take note of the error and act accordingly, and then press the ERASE PAGE key to refresh the screen before continuing.

Table 7-1 lists all Starter and SMI (and related) error and status messages alphabetically and describes when you might receive each one.

Table 7-1. Starter, SMI, and Related Error and Status Messages

Message	Description
A line cannot have both a modem and a printer	At a Define a Console Line screen, you answered "Yes" to the question asking if the console line has a modem on it, and "Yes" to the question asking if the line has a printer on it. One console line cannot have both. Check your hardware and change at least one of your responses to "No."
ABORT 32-bit process trap	A process started by Starter or SMI has terminated abnormally.
ABORT Console interrupt	A console interrupt interrupted a process subordinate to Starter or SMI.
ABORT Customer chained	An error occurred with the network.
ABORT Customer-server connection broken	You were working over the network and the connection was broken, so your process was terminated.
ABORT Terminated by superior process	A process higher in the process hierarchy than yours has terminated your process.
CAUTION: Preset powerup values have been reinitialized to their default values	This message occurs during powerup. If you received an error message during testing of a circuit board, or if a test hung, and you turned power off and on again, as instructed, this message might result.
Console line number is too high	At the Define Console Lines screen, you specified a console number higher than the range allowed. Valid console numbers are 2 through 29, depending on how many console lines you have.

(continues)

Table 7-1. Starter, SMI, and Related Error and Status Messages

Message	Description
Console line number is too low	At the Define Console Lines screen, you specified a console number lower than the range allowed. Valid console numbers are 2 through 29, depending on how many console lines you have.
Data Check Error or *Data Overrun Error*	You probably specified a baud rate too high for a letter-quality printer. Try 2400, or 1200 if 2400 resulted in error.
Directory access denied, File <pathname>	You attempted to back up files in a directory to which you do not have access. You must have W (Write), R (Read), and E (Execute) access to the directory.
Drive not ready. (Is diskette properly inserted, and is latch closed?)	The diskette drive is not currently usable by the system. Remove the diskette and reinsert it. Close the latch. See Chapter 4 if you need further instructions.
Enter one of the menu entry numbers listed, or enter a command	You specified a number that is not one of the current menu options, or a word that is not a valid keyword.
Fatal diskette error - Halting	The system has encountered an error with the diskette that it cannot fix. There might be a problem with the diskette drive. Phone your DGC support center.
File access denied, File <pathname>	You attempted to back up files to which you do not have R (Read) access.
File name already exists	When creating a queue, you attempted to give it a name that is already a filename in the :PER directory. Give it a different name. Do not attempt to give a queue a name that you have already assigned or plan to assign to a printer.
FROM PMGR: *IAC DEVICE CODE nn DOES NOT* *RESPOND - BYPASSING THIS IAC*	Powerup testing found something wrong with an asynchronous communications board. Phone your DGC support center.
Illegal password character	You attempted to specify a password character that is not allowed. Valid password characters are all printable characters except for the caret (^) character.
Illegal username character	The username you entered when creating a profile contains a character that is not allowed in usernames. The valid username characters are A - Z, 0 - 9, underscore (_), period (.), question mark (?), and dollar sign ($).
Input number is too large	The number you specified at the current input field is larger than allowed for that field.

(continued)

Table 7-1. Starter, SMI, and Related Error and Status Messages

Message	Description
Invalid baud rate specified	The value you entered for baud rate at the Define a Console Line screen is not one of the allowable values. Look at the list of values on the screen and select one.
Invalid console name	You specified the name of a console that does not exist, or you typed a console's name incorrectly.
Invalid date	The date you specified at the Change System Date or Time screen either is not a valid date, or is not in an acceptable format. You must specify the date in the format dd-mmm-yy or mm/dd/yy.
Invalid device name	The name you specified at a prompt for a device name is not a valid device name. Refer to Table 2-2 for a list of device names.
Invalid fileset name	While attempting to install software from diskette, you specified an invalid name when prompted for a fileset. Check the software product's Release Notice for the correct fileset name.
Invalid system file size	The system or program you instructed Starter to start up does not have a valid file size, and is therefore probably not really a system or program.
Invalid time	The time you specified at the time field of the Change System Date or Time screen is either not a valid time, or is not in an acceptable format. You must specify the time in the format hh:mm:ss, with AM or PM optional. If you don't specify AM or PM, a 24-hour format is assumed.
Keyword does not accept arguments	You attempted to enter arguments to a command keyword that does not accept them.
Keyword expected but not found	Starter or SMI expected you to enter a keyword at, or as part of, the current input field.
Keyword is unknown	The value you entered is not one of the Starter or SMI keywords. Check the listing of Starter and SMI keywords in Appendix B to find the keyword you need.
Library does not contain the screen format, <screen-name>	A screen is missing from your Starter or SMI package.
No help available for input field, <field-name>	There is no help text on-line for the input field at which you pressed the Help key. Refer to the appropriate section of this manual for instructions.

(continued)

Table 7-1. Starter, SMI, and Related Error and Status Messages

Message	Description
Non-unique abbreviation	The abbreviation you used at an input field is not unique. You must enter a longer abbreviation or the entire word.
Number expected but not found	Starter or SMI expected you to enter a numeric value at, or as part of, the current input field.
Numeric argument out of range	The number you specified as an argument is not within the acceptable range for that argument.
Password must have 6 to 15 characters	You attempted to set or change a profile's password to something with an invalid number of characters. Passwords must be at least 6 and no more than 15 characters long.
Pathname must start at the root	You specified a filename or pathname that did not begin at the root directory (:). Be sure to specify the complete pathname.
PIDs lower than 5 cannot be terminated via SMI	You attempted to terminate a process whose PID number is less than 5. Because the low PIDs belong to processes crucial to the system, such as EXEC and the peripheral manager (PMGR), the SMI prevents you from terminating them and therefore from accidentally shutting down the system. If, for some reason, you do need to terminate a PID lower than 5, you can do so from the CLI.
Please complete this field or press a function key	You did not fill in a required input field. Enter a value or press the Cancel/Exit key to abandon the screen. Or press the Help key to get more information.
Please give a "Yes" or "No" reply	The current input field will accept only a Yes or No answer (optionally specified Y or N).
Please wait while bootstrap software is installed on disk, <unit-name>	When Starter rebuilds the disk, it must install the bootstrap software on the disk so AOS/VS can be booted.
Please wait while the disk is being evaluated, <unit-name>	Starter must evaluate the disk before it will continue.
Please wait while the disk is being fixed, <unit-name>	After an abnormal shutdown, if your disk needs FIXUP to be run. it will run automatically, and you will see this message.
Please wait while the disk is being software formatted, <unit-name>	Before Starter can load files onto the disk, the disk must be software formatted. If you are rebuilding the disk, or formatting a disk/diskette, or restoring the disk with PCOPY, you might see this message.
Process termination - error flag but no error code	A subordinate process started by Starter or SMI has terminated.

(continued)

Table 7-1. Starter, SMI, and Related Error and Status Messages

Message	Description
Queue already exists	While attempting to create a queue, you specified a name for which a queue already exists. Give the queue a different name. Do not attempt to give a queue a name that you have already assigned or plan to assign to a printer.
Queue does not exist	While attempting to open, start, stop, or delete a print queue, you specified a name that does not belong to any queue.
Queue is already open	You specified to open a print queue that is already open.
Queue is not a print queue	The queue whose name you specified is a queue, but not a print queue. You were attempting to start, stop, open, or delete the queue, or to queue a print request to it. Try another queue name.
Queue is not open	You attempted to close a queue that is already closed, or you tried to queue a print request to a closed queue.
Range numbers must be in ascending sequence	The numbers you specified to indicate a range of numbers are not in ascending order. Reorder them with the lower number first.
Script file failure (End Of File)	A process Starter was running has encountered an error.
SYSBOOT is not installed on the disk	Your bootstrap software is missing.
Terminated by system	The system has terminated the subordinate process that was running.
The first line is already on display.	While viewing help, you pressed the Previous Screen function key (F3) while the first line of help text was already being displayed.
The last line is already on display.	While viewing help, you pressed the Next Screen function key (F4) while the last line of help text was already being displayed.
Too many arguments to command	The command or command keyword that you specified doesn't accept as many arguments as you entered.
Unknown keyword	The value you entered is not one of the Starter or SMI keywords. Check the listing of Starter and SMI keywords in Appendix B to find the keyword you need.
User trap	Something has failed. Try to continue what you were doing, but realize you will probably get this error again.

(continued)

Table 7-1. Starter, SMI, and Related Error and Status Messages

Message	Description
Username already exists	You attempted to create a user profile with a username for which a profile already exists. Enter a different username.
Username directory already exists	You tried to create a user profile with a username for which there is already a directory in :UDD. This probably happened because you deleted that user's profile, but opted not to delete the user's :UDD directory. Choose a different username, or back up the existing username directory to tape or diskette and then use the CLI to delete the directory.
Username does not exist	When attempting to modify or delete a profile, you specified a username for which no profile exists.
<Username> does not have write access to <pathname>. You cannot back up this directory.	You attempted to back up files in a directory to which you don't have W (Write) access. You must have W, R (Read), and E (Execute) access to the directory.
Username must have 1 to 15 characters	The username you specified when creating a user profile did not have a valid number of characters. Usernames must be between 1 and 15 characters.
Wrong diskette inserted.	You have inserted the wrong diskette in the drive. The system will prompt you for the correct diskette. Remove the diskette from the drive and find the diskette specified. Insert it and press NEW LINE.
You are not privileged to perform this function	Your profile doesn't contain the privileges required to perform the function you were attempting.

(concluded)

The rest of this chapter is for the

System Manager ☑

System User ☐

Powerup Problems

Most of the time, powerup goes very smoothly. Occasionally, however, a problem might occur. This section explains what you should do if your powerup doesn't go exactly as it should.

We will deal with the following conditions in this section:

- Problems during powerup diagnostic programs.

- If you make a mistake.

- If the system can't find the Starter program.

This section handles error situations up to, but not including, the Starter program portion of powerup. For abnormal situations while Starter is running, see the next section headed "Disk Abnormalities Detected by Starter."

Problems During Powerup Diagnostic Programs

Powerup diagnostic programs are responsible for testing your system's hardware to be sure it is functional. If any part does not test out correctly, you will receive an indication of this immediately. The indication you receive will vary, depending on which computer you have and what portion of the tests failed, and why.

The LED Display on DS/7700-Series Systems

If you have a DS/7700-series system, the first powerup indicator is the digital LED display on the front panel. As you read earlier in this manual, the LED display will flash through many numbers and letters, finally remaining a lowercase b or d.

If a number or letter other than b or d remains lit for 5 minutes or more, it is indicating an abnormal condition. In some cases, the problem might be something you can fix without difficulty. In others, you might have to phone your Data General support center to replace a part. In any case, the number or letter displayed on the DS/7700 system's front panel will indicate exactly what, if anything, needs to be fixed. Table 7-2 explains what to do in any of these abnormal conditions.

Note also that, immediately upon seeing the b or d permanently lit, you should start receiving messages on your system console screen. If this does not occur, refer to Table 7-2.

Table 7-2. Error and Status Indicators on the LED Display

Indicator	Status or Error Condition	What to Do
[nothing]	The computer is not getting any power.	First check to be sure your computer is plugged into a working electrical socket. Then check to be sure you have cabled your computer exactly as shown in your installation guide. Turn power off and on. If you still don't have a period illuminated, phone your DGC support center.
	The computer is receiving power.	If nothing else lights up within a minute, try turning the computer off and on again. If the same thing happens, phone your DGC support center.
0	The system board in your machine is not working properly.	Phone your DGC support center with the status code. You need a new part.
1	Something is wrong with your diskette drive.	Phone your DGC support center with the status code. You need a new part.
2	Something is wrong with your tape drive.	Phone your DGC support center with the status code. You need a new part.
3	Something is wrong with your hard disk drive or your hard disk.	Phone your DGC support center with the status code. You need a new part.
4	Something is wrong with your diskette, or there isn't a diskette in the drive when there should be, or the system did not find what it expected to on the diskette.	Do the following: 1. If you were attempting to start up from diskette, be sure you put a SYSTEM MEDIA diskette in the drive. 2. If you have two diskette drives, be sure you have used unit 0. 3. Be sure you have inserted the diskette correctly. 4. Try another SYSTEM MEDIA diskette in the drive, in case the diskette is damaged. If none of these actions solves the problem, phone your DGC support center with the status code.

(continues)

Table 7-2. Error and Status Indicators on the LED Display

Indicator	Status or Error Condition	What to Do
5	Something is wrong with your tape, or there isn't a tape in the drive when there should be, or the system did not find what it expected to on the tape.	Do the following: 1. If you were attempting to start up from tape, be sure you put a SYSTEM MEDIA tape in the drive. 2. Be sure you have inserted the tape correctly. 3. Try another SYSTEM MEDIA tape on the drive, in case the tape is damaged. If none of these actions solves the problem, phone your DGC support center with the status code.
6	The system could not find the ADES code on your hard disk or on magnetic media.	If you already had ADES loaded on your hard disk, your disk may be damaged; refer to Appendix A. If you were attempting to load ADES from media, then you have probably forgotten to mount your tape or diskette. Turn off the computer's power and mount the ADES media, then power up again.
7	Something is wrong with your video memory board.	Phone your DGC support center with the status code. You need a new part.
8	Some of the hardware that connects the parts of your system isn't functioning properly.	Phone your DGC support center with the status code. You need a new part.
9	Something is wrong with your communications board.	Phone your DGC support center with the status code. You need a new part.
A	Your system wasn't able to locate a system console.	Check to be sure you followed installation directions correctly. Be certain you have at least one terminal cabled to an appropriate board and plugged into a *working* outlet. Be sure the terminal is turned on (the on-line light should be glowing). Then turn power off and back on. If the same status code results, phone your DGC support center.

(continued)

Table 7-2. Error and Status Indicators on the LED Display

Indicator	Status or Error Condition	What to Do
b	The system has found the location of your system console: on your system board.	If you don't see anything on your screen 1. Be sure your terminal is plugged into a working outlet. 2. Check the brightness switch on your monitor to be sure it's turned up. 3. Check the cabling to be sure you've set up the machine correctly. If the problem still exists, there could be something wrong with the monitor or your computer's memory. Phone your DGC support center.
C	An error occurred while the system was trying to locate your system console.	Phone your DGC support center. with the status code.
d	The system has found the location of your system console: on the video memory board.	See the instructions under status code b, above.
E	An error occurred while the system was trying to locate your system console.	Phone your DGC support center with the status code.
F	There is a problem with your communications board.	Phone your DGC support center with the status code.

(concluded)

LED Indicators on the DS/7500-Series System Keyboard

If your system console on the DS/7500 system is a graphics terminal, the system will use the four LED lights on the keyboard to indicate powerup tests in progress. The lights will flash intermittently as tests go on, and then revert to their regular keyboard functions once test messages start to appear on the terminal screen. However, if the lights remain steady in a pattern and no messages appear, they are probably indicating an error condition. Most of the error conditions they show correspond to those listed in Table 7-2, in the previous section.

Table 7-3 shows the cause of each pattern of lights. If the status corresponds to one of those shown by the digital LED display of Table 7-2, we show the corresponding number or letter in parentheses after the listed cause.

Table 7-3. LED Status Codes on the DS/7500 Keyboard

Lights Illuminated				Probable Cause or Status
ON LINE	ALPHA LOCK	F19	F20	
0	0	0	0	Initialized to this state at powerup.
0	0	0	1	System board (0).
0	0	1	0	Diskette drive (1).
0	0	1	1	Tape drive (2).
0	1	0	0	First hard disk or disk drive (3).
0	1	0	1	Diskette or diskette drive (4).
0	1	1	0	Tape or tape drive (5).
0	1	1	1	Power-up diagnostics (6).
1	0	0	0	Video Memory Board (7).
1	0	0	1	Second hard disk or disk drive (3).
1	0	1	0	Reserved.
1	0	1	1	System console not found (A).
1	1	0	0	Reserved.
1	1	0	1	Memory being checked for video memory board.
1	1	1	0	System console on video board (d).
1	1	1	1	Standard hardware tests complete.

KEY:
0 = Light off
1 = Light on

For example, suppose the lights labeled F19 and F20 remain lit, while ON LINE and ALPHA LOCK are off, and nothing appears on the screen. By using Table 7-3, we find that the cause of this condition is the tape drive and the status code for this display is 2. We then look at Table 7-2, and find the description for status code 2. The third column of this description contains instructions on how to remedy the situation.

Failures Before Powerup Messages on MV/2000 DC

On MV/2000 DC systems, the first status indicators you receive are the messages on the screen. If something goes wrong during the few diagnostic tests that take place before your screen is active, you won't see any messages. If you have turned on the power of both your system console and the MV/2000 DC computer, and see no messages within half a minute or so, follow these steps in order:

1. Turn power off and on again.
2. Check to be sure the green power button is lit on the MV/2000 DC. (This indicates that the computer is receiving power.) Also listen for the fans whirring inside the unit.
3. Be sure the terminal you are looking at is the system console. (Refer to Chapters 1 and 2 for information on the system console.)
4. Check to be sure the ON LINE light is lit on the system console's keyboard. (This indicates that the terminal is receiving power.)
5. See if the red light on the diskette or tape drive is lit (if present). (This indicates that the drive is receiving power.)
6. See if any meaningless characters print out on the screen. (This indicates that the terminal is working.)
7. Take the terminal off-line by pressing and holding the CMD key, and then pressing the ON LINE key. Type some characters on the screen to be sure the terminal is functional. (If the characters don't echo, then you have a problem with your terminal.) If the characters do echo, put the terminal back on line by issuing the CMD-ON LINE sequence again.

If your terminal is functional, but you still do not receive any powerup messages, phone your DGC support center with the information you've gathered from the above steps.

Failure Messages During Powerup Diagnostic Programs

If diagnostic programs encounter a problem while testing a board on your MV/2000 DC or DS/7000-series system, the powerup messages on the screen are affected in one of two ways. The most common type of error situation you might see would resemble the screen shown in Figure 7-1, which is an example of a test failure on the optional video board.

```
TESTING...

    Model # xxxx; Slot y; Video Memory Board
            ABCDEFGHIJKLMNOP, FAILED; ERROR xx:yy:zz
```
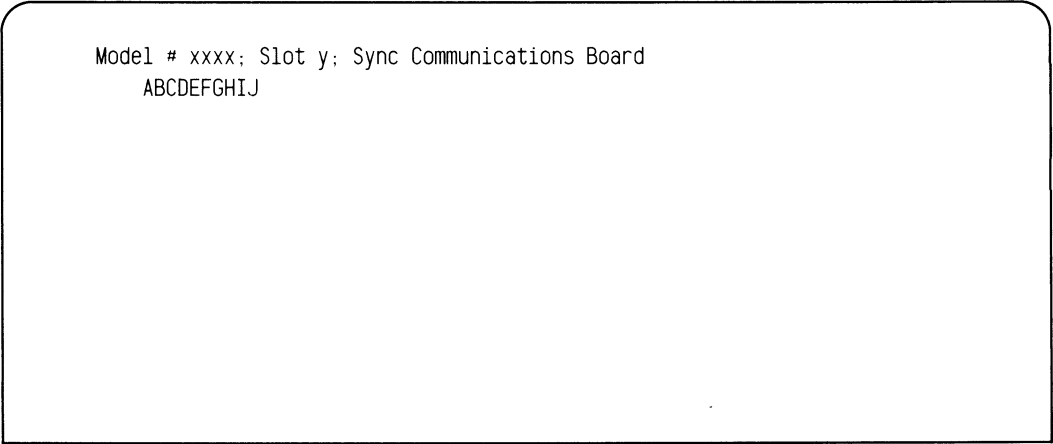
Figure 7-1. Test Failure Message During Testing of Video Memory Board

In the powerup messages, the letters and numbers that print are positive pass indicators; that is, they indicate tests that have passed. Therefore, in the example shown in Figure 7-1, test Q is the test that failed — tests A through P passed.

If you see this type of test failure message, make note of the error code, turn off power to the unit, and then turn power back on. A failure is often transient and won't recur. If this is the case, you won't see the message again; however, note that the preset powerup values will have been reinitialized to their default values. If the same error results, phone your DGC support center and relay the numbers that appear in the format xx:yy:zz; they will indicate exactly what needs to be fixed.

Message Hangs During Powerup Diagnostic Programs

The other type of error indication you might receive during powerup messages is a *hang*, which means that something has tested out incorrectly and is preventing the current diagnostic program from continuing. When this happens, you will notice that no new letter or number has printed out to the screen for a long time. In general, a new character will display within 15 seconds, more often even quicker. If several minutes go by and no new character appears, you probably have a hang. For example, suppose you have a communications board, and during its testing you see the message shown in Figure 7-2.

```
Model # xxxx; Slot y; Sync Communications Board
    ABCDEFGHIJ
```

Figure 7-2. Test Message Hang During Testing of Synchronous Communications Board

If several minutes go by and no K appears after the J, you can assume that the K test has hung. Turn off computer power, and turn it on again. The problem might be transient, and may not recur. If this is the case, the same test will not fail. Be aware, however, that if this happens, the preset powerup values will have been reinitialized to their default values.

If the problem was not transient, the same hang will recur. If it does, phone your DGC support center with the status; a service representative will determine what needs to be done.

If You Make a Mistake

Although there are a few ways in which you could make a mistake that would interrupt the normal system powerup, it's not difficult to make your way back to the regular powerup path.

069-000129

Entering Menus by Mistake

When you see either of the first two menus — Automatic Program Load Menu or Operating System Load Menu — you can press NEW LINE or enter 1 to make the powerup sequence continue immediately. But suppose, at either menu, you accidentally enter 2. This would interrupt the normal powerup sequence and place you in an unwanted menu, either the Change Preset Values Menu or the Technical Maintenance Menu. If this should happen, you can immediately return to the powerup path by choosing option 1 on either menu. Type 1 and press NEW LINE.

On later menus, those presented by the Starter and SMI programs, you can escape from an unwanted menu back to the previous menu by pressing the Cancel/Exit key, F11. From PCOPY and the load program LFLOAD (see Appendix A), you can escape by issuing the CTRL-C CTRL-B sequence.

Accidentally Pressing CMD-BRK, BREAK, or BRK

A less easily resolved, but hardly catastrophic, situation can result if you inadvertently enter the break sequence (CMD-BREAK, BREAK, or BRK) during the powerup sequence. What you should do to remedy the situation depends on where in the powerup sequence you are.

During powerup diagnostics, you aren't likely to enter a break sequence because you aren't using the keyboard yet. However, if you do somehow accidentally enter the break sequence, you should immediately turn off power to your computer. Then turn power back on and start over again. If you don't turn off the power, the powerup will continue, but an error might have registered, which could cause a hardware problem. Your best course of action is to start over.

Once diagnostic programs are finished and you have begun receiving the menus you can respond to, the chance of your erroneously entering a break sequence is greater. If you accidentally enter the break sequence, your powerup will be interrupted. Pressing BRK (or BREAK or the CMD-BREAK sequence on some terminals) instructs the system to immediately leave the current execution path and place you into the System Control Program (SCP) CLI. The SCP is the so-called "bottom layer" of everything that is running on your system. You will know you have entered the SCP CLI if you see the following prompt:

SCP-CLI>

If you accidentally find yourself in the SCP CLI, you can return to normal startup by issuing a simple command, CONTINUE. Just type CONTINUE and press NEW LINE, as follows:

SCP-CLI> CONTINUE ⌡

You will return to wherever you were in the powerup sequence when you entered the break sequence.

If the System Can't Find the Starter Program

During powerup, the system locates the Starter program on the disk and starts it up. If, however, the Starter program isn't available, then you won't see the Starter Main Menu. This might happen if the Starter program was accidentally deleted from the disk, for example.

If the system can't find the Starter program, then it will place you in the Technical Maintenance Menu. If this happens, you will have to load AOS/VS from tape or diskette. Follow these steps:

1. Enter the break sequence. If your terminal has a CMD key, press and hold CMD and press BREAK. If you don't have a CMD key, just press the BREAK or BRK key. You should enter the SCP CLI, which means you'll see the following prompt:

   SCP-CLI>

2. Turn off computer power. (See the NOTE that follows step 8 for an alternative option.)

3. Mount your SYSTEM MEDIA tape on the drive, or insert the first SYSTEM MEDIA diskette. (Note that this is *not* the OS SYSTEM MEDIA diskette.)

4. Turn computer power back on.

5. When you receive the Automatic Program Load Menu, select option "2 Change preset values."

6. When you receive the Change Preset Values Menu, select option "3 Start from a different device."

7. When prompted, enter the choice for the type of release media you have — tape or diskette.

8. Respond as prompted to start up AOS/VS from tape or diskettes. (This sequence is described in Appendix A.) On subsequent powerups, AOS/VS will be on the disk so you can follow the normal powerup instructions.

NOTE: Instead of turning computer power off, you have the option to use a couple of SCP CLI commands to instruct the system to reboot the disk. If you do so, you will not have to wait through the few minutes of powerup diagnostic tests. Use the following procedure:

   a. Enter the break sequence, as described in Step 1, above.

   b. Skip Step 2 and mount your tape or diskette as described in Step 3, above.

   c. When the tape or diskette is mounted and ready, enter the RESET command at the SCP-CLI> prompt, as follows:

      SCP-CLI> RESET)

   d. Instruct the SCP CLI to boot the correct device by using the SCP BOOT command with the appropriate device code (diskette = 64, model 6351 tape = 23, model 6352 or 6341 tape = 63). For example, if you are starting up from model 6351 tape, type the following:

      SCP-CLI> BOOT 23)

   e. Skip Step 4 and perform Steps 5 - 8, above.

If the system can find neither the Starter program nor SYSBOOT — the program that displays the Technical Maintenance Menu — your powerup will hang at the point where the Operating System Load Menu would normally appear and will not display the Technical Maintenance Menu as described above. If this happens, you will have to follow the same steps listed above.

Errors at the Operating System Load and Technical Maintenance Menus

During powerup, a program called SYSBOOT displays the Operating System Load Menu, at which you have the option of entering the Technical Maintenance Menu. There are a few error conditions that could result at these two menus.

Starter Program Not Present on the Disk (as Detected by SYSBOOT)

The Operating System Load Menu displays a line that normally looks like this:

The default operating system is STARTER.SYS

If, for some reason, the Starter program is not installed on your disk, this line will read as follows:

The default operating system is INSTALLED SYSTEM

If you see this message on your Operating System Load Menu, then STARTER.SYS was probably accidentally deleted. You will have to reload Starter. Turn power off and then on again. At the Automatic Program Load Menu, choose option "2 Change preset values." At the Change Preset Values Menu, select option "3 Start from a different device." Mount your OS SYSTEM MEDIA tape or first STARTER diskette, and respond to the question that asks what type of media you are starting from. When you reach the Starter Main Menu, proceed as described in the "Loading New System Software on the Disk (SOFT-WARE)" section of Chapter 2.

Error Messages at the Technical Maintenance Menu

As we mentioned earlier, you have the option of entering the Technical Maintenance Menu from the Operating System Load Menu. You would do this if you wanted to load and verify microcode, enter the SCP CLI, change the time-out delay for the Operating System Load Menu, or run ADES diagnostics. There are several error messages that you could receive while using the Technical Maintenance Menu. Although most of these error situations are rare, and you aren't likely to see most of these messages, we have described them briefly in Table 7-4.

Table 7-4. Error Messages at the Technical Maintenance Menu

Error Message	Meaning
** ABORT ** Hard error reading disk: status in AC0	The system has encountered a bad spot on your disk. You will have to reformat and build the disk. See Appendix A for instructions.
AOS/VS cannot run with this instruction set	You have the incorrect microcode file loaded. You will have to use ADES diagnostics to load the correct file. If you don't have these diagnostics, phone your DGC support center.
Disk and file system revision number don't match	Your system disk and SYSBOOT program have incompatible revision numbers. You have two options: reload your older revision of SYSBOOT, or reformat the disk. The Starter program has a menu option for formatting.
*** Fatal overlay error - error code is in AC0 and AC1 ***	Use Starter's "Load new system software" option to reinstall AOS/VS on your disk. (See Chapter 2 for details.) If the error still results, you will have to reformat and rebuild the disk. Refer to Appendix A.
Hard disk error while reading from the LDU	The system has encountered a bad spot on your disk. You will have to reformat and rebuild your system disk. Refer to Appendix A.
Hard disk error while writing to the LDU	The system has encountered a bad spot on your disk. You will have to reformat and rebuild your system disk. Refer to Appendix A.
Hard error while writing to the system overlay area: Status in AC0	The system has encountered a bad spot on your disk. You will have to reformat and rebuild your system disk. Refer to Appendix A.
Illegal boot device from DSKBT	Run a partial format on your disk. This procedure is described in How to Generate and Run AOS/VS. You can run the DFMTR disk-formatting program from Starter by choosing the "Start a different program or operating system" option on the Main Menu.
Illegal response - try again	The number you typed at a menu is not one of the options listed.
Illegal value - try again	The value you specified for the time-out delay was not within the range 10 - 45.

(continues)

Table 7-4. Error Messages at the Technical Maintenance Menu

Error Message	Meaning
Inconsistent LDU - Run a partial format over this LDU	The system is having trouble with a file it is trying to access. Run a partial format on the disk. Refer to *How to Generate and Run AOS/VS* for information. You can run the DFMTR disk-formatting program from Starter by choosing the "Start a different program or operating system" option on the Main Menu.
LCS instruction failed - Code in AC0 and AC1	The system had a problem while trying to load the microcode. Reload the microcode using the Starter program (described in Chapter 2).
LDU inconsistency - EOF returned when trying to read FIB block	The system had a problem while trying to read a file. Run a partial format on the disk. Refer to *How to Generate and Run AOS/VS* for information. You can run the stand-among Disk Formatter (DFMTR) from Starter by choosing option "2 Start a different program or operating system" on the Starter Main Menu.
Microcode file does not exist.	You specified to load microcode, but the system could not locate a microcode file on the disk. Reload the file using ADES diagnostics.
Microcode file is invalid - Block with length=0 detected	Something went wrong when the system tried to load the microcode file. Reload the microcode using the Technical Maintenance Menu (see Chapter 5).
Overlay area is too small - Must do a partial format to make it larger	Run a partial format on the disk (see *How to Generate and Run AOS/VS*). Specify a larger overlay area. You can run the stand-among Disk Formatter (DFMTR) utility program from Starter by choosing the "Start a different program or operating system" option on the Main Menu.
Premature end of file while reading system file	Something went wrong while reading the system from the master LDU. Reload the system on the disk (see Chapter 2 for information on Starter's "Load new system software" option).
Premature EOF on read of ADES	The ADES bootstrap is in place on your disk, but the ADES diagnostic programs are not. Reload ADES on your disk. (See Chapter 5 for information.)
*** SYSBOOT MUST BE INSTALLED ON THE MASTER LDU! ***	SYSBOOT, the program that starts up AOS/VS, is not on your disk. Install it using Starter's "Load new system software" option (see Chapter 2).

(continued)

Table 7-4. Error Messages at the Technical Maintenance Menu

Error Message	Meaning
System file is too large to load	Try reloading the system (Starter's "Load new system software" option, Chapter 2). If the same error results, do a partial format on the disk and then reload the system. (You can run the Disk Formatter (DFMTR) program from Starter by choosing option "2 Start a different program or operating system" on the Main Menu. See *How to Generate and Run AOS/VS* for information on DFMTR.) If the same error results, use Appendix A to reformat and rebuild the disk.
The ADES bootstrap was not installed	The ADES bootstrap, which you need to start up ADES diagnostic programs, is not on your disk. Either you haven't purchased a service contract (with which you receive ADES), or you don't have the bootstrap installed. Reload ADES on your disk. (See Chapter 5 for information.)
There is no default system; you must specify a default pathname.	Neither the Starter program nor AOS/VS is on your disk. Use Appendix A to reload Starter and reinstall AOS/VS on the disk.
Unknown disk name specified in DIB - Do a partial format	There is a problem with the LDU you were trying to start up from. Run a partial format on this disk (see *How to Generate and Run AOS/VS* for information). You can run the DFMTR disk-formatting program from Starter by choosing option "2 Start a different program or operating system" on the Main Menu.
** Warning ** Disk is in use - FIXUP must be run on this LDU	Proceed with your powerup. Select option "1 Load and start the default operating system" on the Technical Maintenance Menu. Starter will run FIXUP automatically. If Starter is not on your disk, the Technical Maintenance Menu will have more options on it than usual, including FIXUP. Run FIXUP from this menu by selecting option 7, which will be the default.
** Warning ** FIXUP recommended on this LDU to reclaim space	Proceed with your powerup. Select option "1 Load and start the default operating system" on the Technical Maintenance Menu. Starter will run FIXUP automatically only when it is required. If Starter does not indicate that it is running FIXUP, you might want to run it yourself. Select option "2 Run a different program or operating system" on the Starter Main Menu, and specify :FIXUP as the pathname. Press NEW LINE to accept all of FIXUP's defaults *except for* the question "May I fix it?", to which you should type Y and press NEW LINE. See *How to Generate and Run AOS/VS* for complete information on FIXUP.

(concluded)

Disk Abnormalities Detected by Starter

The Starter program recognizes four different error conditions that indicate it cannot start up AOS/VS from the disk. It can't necessarily tell the cause of a disk-related problem, but it can indicate to you that it can't start AOS/VS by allowing you to select only certain Starter Main Menu options. That is, the Starter Main Menu will appear as usual during powerup, but some of its option numbers will be replaced by asterisks. In all of these conditions, the number 1 of the option "1 Start the default operating system" will be replaced by an asterisk.

Table 7-5 shows what Starter menu options appear with each error condition.

Table 7-5. Starter Options Available on Error Conditions

Error Condition	Options Available	Solution
The default system is not on the disk, or the link to the default system is missing.	2, 3, 4, 5, 6	If you want to run a different operating system, select option "2 Start a different operating system." We describe this option in Chapter 2.
		If you want to run the default version of AOS/VS, select option "6 Build or update the system disk," and then select option "3 Load new system software on the disk." We describe this option in Chapter 2.
Certain other required software (such as CLI.PR) is not on the disk.	3, 4, 5, 6	Select option "6 Build or update the system disk," and then select option "3 Load new system software on the disk." We describe this option in Chapter 2.
The disk is not software formatted.	3, 4, 5, 6	Unless you plan to restore your system-wide files from a physical backup (created using PCOPY), select option "6 Build or update the system disk," and then select option "1 Build the disk." We describe this procedure in Appendix A.
		If you have a physical backup of the disk, from which you plan to restore the system-wide user files, select option "5 Restore the disk from a physical backup (using PCOPY)." This type of restoration will place the AOS/VS system files back on the disk so you won't have to load AOS/VS from release media. We describe the restoration of the physical disk in Chapter 2.
The system disk is off-line.	3, 4, 5, 6	Turn system power off and on again. Go through powerup up to the Starter Main Menu and see if any other options show other than 3 or 6. If not, you might have one of the situations described below. Alternatively, you can use option 6 to get to the Build or Update System Disk Menu and then choose option 2 to format a disk other than your system disk.

The most serious of these conditions is the last, in which the Starter program can only recognize that the system disk is not available. When the disk appears to be off-line to Starter, it could actually mean any of a number of things. On MV/2000 DC and DS/7000-series systems, the disk is automatically on-line when you turn on the computer. You could get this error condition, however, if the disk has another problem; for example, you might have noticed some HARD ERROR messages, which could indicate *head misalignment*. This means that your disk's format is damaged. The *heads*, which read from and write to the disk, are not going to the correct area of the disk for the necessary information. If this is the case, you will need to call your DGC service representative, who will recalibrate the heads.

Another serious situation that could cause this error condition is a *head crash*. If this were to happen, you might hear abnormal scraping sounds as the heads marred the disk surface. This condition is unlikely, but possible, and once again you would need to call your DGC service representative, who would replace the disk. You would then have to build the disk, by selecting option "6 Build or update the system disk" on the Starter Main Menu, and then option "1 Build the disk." We describe this procedure in Appendix A.

Physical Unit Failure Message

A PHYSICAL UNIT FAILURE message can occur in several situations. It is always accompanied by a device code, so you know what device failed. Because this error message is not specific to AOS/VS on MV/2000 DC and DS/7000-series systems, we didn't include it in a table of error messages in this chapter. It is described in *How to Generate and Run AOS/VS*.

However, there is one situation in which you might see this message that we will mention here. Suppose you are using Appendix A to rebuild your disk from tape or diskettes, and this message appears while you are loading system software. The message is always accompanied by a device code so you know what device has failed. (See the table of device names and codes in Chapter 2.)

If the diskette drive or tape drive has failed, you will have to start the load over again. Select option "3 Load new system software on the disk" on Starter's Build or Update System Disk Menu and mount or insert media as prompted. If you get this message repeatedly, phone your DGC support center.

For any other situation, see *How to Generate and Run AOS/VS*.

Starter Panics

If Starter ever encounters a serious error situation from which it cannot recover, it will display a panic message on the system console screen. The message will be accompanied by several codes, which represent the values in the computer registers at the time of the panic. It will look something like this:

Fatal system error   000000   00000000   at PC = 00000000000

AC0   AC1   AC2   AC3   C   WSP   WFP
00000000000 00000000000 00000000000 00000000000 0   00000000000 00000000000

Some of the areas shown as zeros above will have other values displayed.

If you receive a panic message, write down all the codes that display. Be sure to copy all codes correctly. Then turn the computer's power off. Power on again as usual. If the same

situation results, check to see if the displayed codes are the same as those you've written down. If not, write the new codes down too. Then phone your DGC support center with the information.

Abnormal System Shutdowns

An abnormal AOS/VS shutdown on an MV/2000 DC or DS/7000-series system is any shutdown not performed from SMI's Shut Down the System Menu. In addition, if you receive an *ABNORMAL SYSTEM SHUTDOWN* message during a normal shutdown, then it too is an abnormal shutdown. An abnormal shutdown can result from a deadlock (hang), fatal AOS/VS error message (panic), hardware failure (which might cause a panic), or power failure.

There are several software tools that can help you handle and recover from abnormal shutdowns. They are

Memory dump routine	Copies main processor memory to tape or diskette for later analysis.
AOS/VS Emergency Shutdown (ESD) routine	Tries to turn the abnormal shutdown into a normal shutdown.
AOS/VS disk fixer (FIXUP)	Corrects disk inconsistencies and allows you to restart AOS/VS. FIXUP takes much longer than ESD to run, but it also corrects inconsistencies that ESD can't. You are not required to run FIXUP unless ESD fails.

This section describes how to use these tools in the event of an abnormal shutdown.

System Deadlocks

If AOS/VS doesn't seem to be processing requests, it might be in a deadlock. Deadlocks can occur for a number of reasons; but they usually occur when your system has been overloaded with too many processes needing the same resources.

The primary symptom of a deadlock is long *response time*. That is, the system takes a long time to repond to input or may, in fact, not respond at all. Users might complain that nothing is happening on their terminals, and you might get slow or no response to requests you issue at the system console. (Note that if the system console shows a *FATAL AOS/VS ERROR* message, a panic has occurred; see the next section.)

Any time a console seems to be hung, the first thing to do is type CTRL-Q at that console, in case a CTRL-S has frozen the console's display. (Also check the red LED light above the HOLD key, if the terminal has one. If it is lit, press the HOLD key once.) If this restores activity, fine; you've found the problem. If it doesn't, make sure the console is on and its on-line light is glowing.

Next, if you are running SMI, you might issue the WHOS command keyword, or select the "List all users logged on" option on an applicable menu. (If you are using the CLI, type ? and press the NEW LINE key.) As the list of active processes displays, you might recognize some as typical processor-demanding jobs; for example, a batch stream that's performing a file backup. A user doing an individual file backup might also slow down the system, and if you're doing a system-wide file backup, you might even be causing the slowdown (one of the reasons we suggest you perform system-wide backups when no other users are logged on).

If you discover the problem process(es), you must then decide whether to live with the slowdown until it is done, or to terminate the problem process(es). (You can terminate a

process from the SMI at the Archive Menu, the Manage Consoles Menu, or the Shut Down the System Menu.)

NOTE: Be sure to talk to the user running the process before you terminate it.

If terminating a problem process doesn't help the response time, or if the system console won't accept any input, you will have to force a shutdown and bring up AOS/VS again. Follow these steps:

1. Type the break sequence on the system console: CMD and BREAK keys, BRK key, or BREAK key. You will receive the SCP CLI prompt:

    SCP-CLI>

2. You will have to use the SCP CLI to reset the processor and force an emergency shutdown. This is very easy; just enter the next two commands at the SCP-CLI prompt:

    SCP-CLI> RESET ⌡

    SCP-CLI> START 50 ⌡

    This should abort processing and start a shutdown. (If, by any chance, nothing happens, type the break sequence again; then type TTY and press NEW LINE.)

    The system console will display this message:

    AOS/VS Processing Aborted
    Do you want a memory dump (to submit a Software Trouble Report) (Y or N)? [Y]

3. Answer the prompt. It is often a good idea to have a memory dump when you encounter a problem, and you should always have a dump if you intend to submit an STR to Data General. It will help the engineers to determine the cause of the problem. However, with deadlock situations, unless the problem occurs repeatedly, a memory dump and STR might not be necessary.

4. If you decide to perform the memory dump, press NEW LINE or type Y and press NEW LINE, and skip to the section called "Doing a Memory Dump." If you don't want a memory dump, type N and press NEW LINE; then go to the section "About ESD."

System Panics

Sometimes a system will encounter an error condition so severe that it cannot or dares not recover from it. When this happens, AOS/VS *panics*. It displays a fatal error message and you have to run *Emergency Shutdown (ESD)*. We describe an AOS/VS panic situation next.

If AOS/VS panics, the system performs the following steps:

1. AOS/VS sends you a fatal error message on the system console in the following format:

   FATAL AOS/VS ERROR: x

   value1   value2   value3   value4
   value5   value6   value7   value8
   stkptr   frmptr   stklim   stkbas

   Do you want a memory dump (to submit a Software Trouble Report) (Y or N)? [Y]

   where *value1 .... stkbas* are all numeric panic values that the system prints out.

   Generally, you should log each panic in a system log book kept near the system console. Note the time, the revision of the AOS/VS system, any unusual conditions (such as new software or hardware) that may have caused the panic, and the panic values. The written record is especially important if your system console is a display terminal rather than a hard-copy terminal. Panic records can be very important to DGC personnel whom you might call on for assistance.

   Whenever you encounter a fatal error, it is a good idea to take a *memory dump* to submit to Data General with your Software Trouble Report (STR). The dump will help DGC engineers to find the cause of the error.

2. Answer the prompt.

   a. If you enter N, ESD will run, and you will receive the message

      Running ESD ...

      Skip to the section "About ESD."

   b. If you want a memory dump, go to the next section, "Doing a Memory Dump."

Doing a Memory Dump

AOS/VS always offers to do a memory dump after it panics or you issue the break sequence and RESET/START 50 sequence. As we mentioned earlier, DGC engineers analyze memory dumps to try to determine the problem when you submit an STR. You can skip the dump by entering N in response to the "Do you want a memory dump...." prompt, but do so only if you don't want to submit an STR. To perform a memory dump, use the following steps:

1. Get a scratch tape or several scratch diskettes (about three diskettes for each 2 Mbytes of memory). Diskettes must be hardware formatted. (Note that if there is already a diskette in the diskette unit *and it is initialized as an LDU*, you must first remove it and set it aside.)

2. Mount the tape or insert a diskette in the appropriate unit.

3. Enter Y in response to the prompt that asks if you want a memory dump (if you haven't already). You will receive the following prompt:

   Dump to magnetic tape or diskette (T or D)? [T]

4. Enter T if you want to dump to tape, D if you want to use diskettes.

    a. If you enter T or just press NEW LINE, you will receive the following prompt:

        Please mount tape. Then specify unitname. [MTJ0]

        Type your unitname and press NEW LINE, or just press NEW LINE to accept the default. The routine will check the device and perform the dump. When it is done, it rewinds the tapeand displays the following message:

        Memory dump completed.

        Running Emergency Shutdown (ESD)

        It will then run ESD automatically. Remove the tape and label it in preparation for the STR. (Skip the following steps and refer to the section "About ESD.")

    b. If you enter D for diskette, you will see the following:

        Please insert diskette in unit. Then specify unitname. [DPJ10]

        Proceed to Step 5.

5. Press NEW LINE to accept the default unitname, DPJ10. The routine will check the device, and then start the dump. It will display the message *Dumping* followed by a period every 30 seconds or minute. For example, after 5 minutes the message might look like this:

    Dumping........

    When the diskette is full, the routine displays the message

    Diskette is full.
    Please insert next diskette in unit. Press NEW LINE when ready.

6. Remove the diskette and insert the next one. Be sure to number them.

    The *Dumping* message and the prompt that follows will repeat until the dump is finished. Then the routine will prompt you to remove the last diskette and press NEW LINE, before it begins running ESD, as follows:

    Memory dump completed. Please remove diskette.
    Press NEW LINE when ready.

7. Remove the final diskette and label it in preparation for the STR.

    If you had a diskette that was initialized as an LDU in the diskette unit, reinsert it *before* you press NEW LINE to run ESD. After you press NEW LINE, the system will display the following message:

    Running Emergency Shutdown (ESD)

    See the section "About ESD."

NOTE: If the memory dump routine encounters an error, it will prompt you to retry. To do this, remove the tape or diskette, mount or insert a different one, and enter Y.

About ESD

The system tries to run ESD after a panic or a break, RESET/START 50 sequence, and after you have done or skipped the memory dump. ESD is a routine that tries to restart AOS/VS and force a normal shutdown, by doing things like closing open files. ESD cannot, however, cope with certain system errors, and it can't verify the accuracy of system databases that the panic may have affected. But it does offer a good way to handle panics.

When ESD runs, it displays the following messages:

Running Emergency Shutdown (ESD)

File system restart
Now restarting device 024 unit 0

Flushing buffers

Open file processing

The processor is halted. The system will then display the following:

System shutdown

Please turn off power.

Turn off system power; then turn it on again to restart (or use the alternative sequence described in the "Shutting Down the System" section of Chapter 3).

If ESD fails, it issues a fatal error message of its own. If this happens, we recommend that you accept the default response at that point, which is to take a memory dump. If you submit this dump with an STR to Data General, it will help us to improve ESD. After the dump is complete, ESD will attempt to run again. If it fails again, it cannot deal with the error. Reset the computer by turning power off, and then on again, and start up Starter again. FIXUP will run automatically.

The AOS/VS Disk Fixer (FIXUP)

Abnormal shutdown leaves the disk(s) in an unpredictable state, with open files that may not have been updated. ESD, if it succeeds, updates files with information that was entered, but not yet written to the files (information in system buffers). It also closes the files and restores disk integrity.

If ESD fails, however, then you must run FIXUP to fix the disk. On most DGC computers, you must specify when you want FIXUP to run. However, on MV/2000 DC and DS/7000-series systems, FIXUP runs automatically on powerup after an abnormal shutdown if the system appears to need it. You will know FIXUP is running if you see the following message at the bottom of your screen:

Please wait while the disk is being fixed, DPJ0

For more information on FIXUP or ESD, refer to *How to Generate and Run AOS/VS.*

End of Chapter

Appendix A
Reinstalling AOS/VS If the Disk Is Damaged

This appendix is for the

System Manager   [✓]

System User   [ ]

If you have a new hard disk, or if your hard disk is damaged, you won't be able to bring up AOS/VS on it. You will need to go through a special procedure to reload AOS/VS onto the disk.

In addition, the Starter program recognizes different conditions that indicate it cannot start up AOS/VS from the disk. We described these conditions in Chapter 7, "What If Something Goes Wrong?". If, during powerup, you receive one of these indications, you'll need to use the information in this appendix starting from step 12 of the "Powering Up" section. Be sure to refer to Table 7-3 in Chapter 7 before doing so.

The major sections in this appendix are

- About Your Media

- Powering Up

- Loading AOS/VS from Tape

- Loading AOS/VS from Diskettes

- Installing Powerup Diagnostics

- Reloading User Files from Backup

About Your Media

All MV/2000 DC and DS/7000-series computer systems include at least one diskette unit or tape unit. Some systems have both. If you have both, use tape whenever possible.

Diskette-Only Systems

If your hardware doesn't include a tape unit, all components you need to build AOS/VS were supplied on diskettes, in the following groups:

* Powerup diagnostics and computer microcode, on two or three diskettes. (The third diskette has microcode in UNIX dump format. You won't need this UNIX diskette; use it for a scratch diskette.)

   The first diskette holds essential powerup routines. Its paper label includes the words MASTER DISKETTE and SYSTEM MEDIA. We will refer to it as the SYSTEM MEDIA diskette.

   The second diskette holds the microcode file for your computer in a form AOS/VS can read. The paper label includes the words MASTER DISKETTE, followed by your computer name and .MCF (for example, DS7700.MCF or MV2000.MCF) and AOS DUMP FORMAT. This is the .MCF AOS DUMP FORMAT diskette.

* AOS/VS startup media, on two diskettes, labeled "STARTER."

* AOS/VS system programs, the latest revision, on 18 or so diskettes. One group of diskettes is labeled "OS UTILITIES MEDIA."

* An AOS/VS update (updates for programs in the latest revision), on one or more diskettes. You get the update diskette(s) only if an update has occurred since the last AOS/VS revision.

* DG/VIEW windowing management program, on one or more diskettes, on DS/7000-series systems only. (The easiest way to install this software on your disk is via the SMI. After you finish following the steps in this appendix to load AOS/VS on the disk, refer to the section "Installing Software" in Chapter 3 for information.)

Systems with Tape

If you have a tape unit, you can receive powerup diagnostics on tape or diskette. In most cases, you'll receive AOS/VS software programs on tape. The tapes are as follows:

* Essential powerup diagnostics are on one tape. The paper label includes your computer name and the words SYSTEM MEDIA. We refer to this tape as the SYSTEM MEDIA tape. Note that, for DS/7700 systems with tape, the powerup diagnostics are supplied on a SYSTEM MEDIA diskette, described in the previous section.

* AOS/VS programs and files are on one tape. The paper label on the AOS/VS tape includes the words "OS SYSTEM MEDIA."

* AOS/VS update, if any, on one tape. The paper labels on AOS/VS Update tapes have "UD" and "AOS/VS n" printed on them, where n is the revision number.

* DG/VIEW windowing management program, on one tape, on DS/7000-series systems only. (The easiest way to install this software on your disk is via the SMI. After you finish following the steps in this appendix to load AOS/VS on the disk, refer to the section "Installing Software" in Chapter 3 for information.)

Software products other than AOS/VS, like CEO or INFOS II, must wait until you have AOS/VS up and running.

After checking your media as explained above, proceed.

Powering Up

The following numbered steps lead you through the entire "from blank disk" procedure. The steps cover both tape and diskettes; you'll skip the ones that don't apply.

1. The steps assume that computer power is off. If it's on, turn it off.

2. Turn on the system console. The console may display a test message and beep. If there is an ON LINE light on the keyboard, it should glow. (If the light doesn't glow, press and hold the CMD key, and press the ON LINE key. The ON LINE light should glow.)

3. If you have a tape unit that's separate from the computer cabinet, turn it on. (To use such a unit, you must turn it on before turning computer power on.)

4. Find the SYSTEM MEDIA tape or diskette. Note that this is *not* the tape labeled OS SYSTEM MEDIA. All tapes and diskettes that have OS on their labels are AOS/VS software media.

   a. If you received system media on tape, mount the SYSTEM MEDIA tape on the tape drive. Make sure this unit is online (if this applies).

   b. If you received system media on diskette, remove the SYSTEM MEDIA diskette from its outer envelope and insert it in the diskette drive. Turn the latch beside the slot to the horizontal position, locking the diskette in the unit.

5. Turn computer power on using the power switch on the cabinet. The power light in (or above) the switch should glow. The computer runs powerup tests and indicates the results as described in Chapter 2. The tests take 1 to 2 minutes.

   On a DS/7500, depending on options, there may be no display on the system console; if you see the Automatic Program Load Menu, described in Chapter 5, the system has passed powerup tests. On a DS/7700, the powerup tests display a status code in the digital LED display; if the code is "b" or "d", the system has passed. A DS/7700 might also display messages on the system console.

   (If your system doesn't pass powerup diagnostic tests, you may have inserted the tape or diskette wrong. Return to step 4a (tape) or 4b (diskette) to retry. If the problem recurs, the hardware or cables may not have been properly connected. Check the connections; and check the status code in the table in Chapter 7.)

   The Automatic Program Load Menu will display.

6. Now, you must change a preset value. Type 2 and press NEW LINE at the "Enter choice:" prompt. The computer will display the Change Preset Values Menu, as shown.

Change Preset Values Menu

1 Continue the powerup
2 Change the system date or time
3 Start from a different device
4 Change the default device
5 Change the time-out delay for the Automatic Program Load Menu
6 Enter the SCP CLI
7 Change the system console
8 Select diagnostics sequence
9 Configure parallel printer port
...

7. Remove the SYSTEM MEDIA diskette or tape. Return the diskette to its outer envelope, or the tape to its case, if applicable.

8. Insert the correct AOS/VS diskette or tape. If you received AOS/VS on diskettes, insert the first "STARTER" diskette in the drive. If you received AOS/VS on tape, mount the "OS SYSTEM MEDIA" tape in the unit.

9. Specify option "3 Start from a different device" at the "Enter choice:" prompt of the Change Preset Values Menu.

   Enter choice [1]: 3 ⌡

10. When prompted for which device, specify 2 for diskette or 3 for tape. For example, if your system media is on tape, respond as follows:

    Start from which device? [1]: 3 ⌡

11. Your next action depends on whether you are booting from tape or diskette.

    a. If you are using tape, you will be prompted for a tape file number. You want tape file 5, so respond as follows:

       Tape file number? 5 ⌡

       The system will boot the tape.

    b. If you are using diskettes, the system will output the message *Loading diskette* and then prompt you when it's ready for the second one, as follows:

       Insert second "STARTER" diskette and press NEW LINE when ready.

       Remove the first Starter diskette and insert the second. Press NEW LINE. The system will boot the diskette and display the *Loading diskette* message again.

    Next, the Starter Main Menu will appear on your screen. Because there isn't an operating system on the disk, menu options 1 and 2 will have their numbers replaced with asterisks.

12. Select option "6 Build or update the system disk" by typing 6 and pressing NEW LINE. The Build or Update System Disk Menu will appear.

13. Select option "1 Build the disk" by typing 1 and pressing NEW LINE. A message will appear at the bottom of the screen:

    Please wait while the disk is being software formatted, @DPJ0

    Formatting the disk is a lengthy procedure. It will take about 2 minutes per megabyte; that is, over 2 hours for a 70-Mbyte disk and about 4 hours for a 120-Mbyte disk. You can leave the system and go do something else, and check back later to see if it's ready to continue.

    After the disk is formatted, you will load AOS/VS. Use the next section if you are loading from tape. If you are loading from diskettes, skip to step 20.

Loading AOS/VS from Tape

14. Starter will prompt you to mount or insert the system tape, as follows:

    Mount the "OS SYSTEM MEDIA" tape on unit @MTJ0
    Press NEW LINE when ready.

15. You already have the tape ready (step 8). Press NEW LINE. Starter will clear the screen and display the following message at the top of the screen:

    Please wait. File(s) will be loaded.

16. The filenames of the files being loaded will then scroll on your screen. Then the following message will display at the bottom of the screen:

    Please wait while bootstrap software is installed on disk, DPJ0_LDU

    The message *Please wait. File(s) will be loaded.* will then be repeated as Starter |
    loads the default SYSMGR profile file onto the disk, displaying its name on the
    screen.

    When it is finished loading files, the Starter program will redisplay the Build or ＊
    Update System Disk Menu.

17. Press Cancel/Exit (F11) to return to the Starter Main Menu.

18. Remove the tape from the drive.

19. Turn off computer power and skip to the "Installing Powerup Diagnostics" section. |

Loading AOS/VS from Diskettes

20. Starter will clear the screen and prompt you to insert the diskette containing the
    default SYSMGR profile, which is the first diskette of the OS UTILITIES MEDIA
    set, as follows:

    Mount the first of the "OS UTILITIES MEDIA" diskettes in unit @DPJ10

    Starter will start up a load program, LFLOAD, which will also prompt you to insert
    the diskette, as follows:

    Please insert a diskette (VOL1). Press NEW LINE when ready.

21. Remove the second STARTER diskette and insert the first OS UTILITIES MEDIA
    diskette into the diskette drive.

22. Press NEW LINE.

    The load program will load the profile and display its filename on the screen. When
    finished, it will prompt you to remove the diskette. Since you will be loading more
    files from this diskette now, *ignore this prompt.*

    Starter will then prompt you to insert the first diskette of the "OS UTILITIES
    MEDIA" set, so it can load more files.

23. You already have the diskette inserted, so press NEW LINE as instructed.

Starter starts up the load program again, which will remind you to insert the diskette and press NEW LINE when you are ready.

24. The diskette is already inserted, so press NEW LINE as instructed.

The load program will load files from the diskette. As it does so, it will display a list of the filenames on your screen. When the program is finished, it prompts you for the next diskette:

-- *Please insert the next diskette (VOL2). Press NEW LINE when ready.*

25. As you are prompted, remove the first OS UTILITIES MEDIA diskette and insert the second. Then press NEW LINE.

The program will prompt you for subsequent diskettes in the same manner. When it has finished loading, it will prompt you as follows:

-- *Please remove the diskette.*

26. Remove the last diskette. Starter will then display the following message:

Please wait while bootstrap software is installed on disk, @DPJ0

When finished, Starter will redisplay the Build or Update System Disk Menu.

27. Press Cancel/Exit (F11) to return to the Starter Main Menu.

28. Turn off computer power.

CAUTION: It is very important that you remove the diskette *before* you turn off power to the computer. If you don't do this, you could lose data on the diskette.

Installing Powerup Diagnostics

Next, you'll install powerup diagnostics on the hard disk. The computer can't run without these. Until they are installed on the hard disk, the SYSTEM MEDIA diskette or tape must be in its unit whenever you turn power on.

29. Mount your SYSTEM MEDIA tape or diskette.

30. Turn computer power on.

31. Proceed through powerup diagnostics until the Automatic Program Load Menu appears on your screen. When it does, select option "2 Change preset values," as follows:

dd-mmm-yy hh:mm:ss

Automatic Program Load Menu

1 Continue immediately with preset values
2 Change preset values
. . .
Enter choice [1]: 2)

32. When the Change Preset Values Menu appears, select option 3 Start from a different device, as follows:

dd-mmm-yy hh:mm:ss

Change Preset Values Menu

.
.
.

3 Start from a different device

.
.
.

Enter choice [1]: 3 ↵

33. At the Start From a Different Device screen, select the appropriate number — 2 for diskette or 3 for tape. For example, if you are installing from diskette, you would respond to the prompt as follows:

Start from which device? [1]: 2 ↵

The system will boot the diskette or tape, and the hardware will read the diagnostics installer from the diskette or tape. Then it will display the following:

Do you want to install powerup diagnostics on your hard disk? If these diagnostics are not installed on the hard disk, you will need to insert this diskette each time you power up. For the diagnostics to work, the disk on which they will be installed must have a Diagnostic Area reserved by the operating system's software formatter.

Install powerup diagnostics (Y or N)? Y

34. You want to install, so accept the default, Yes, by pressing NEW LINE.

The diagnostics installer will then copy powerup diagnostics from diskette or tape to the reserved area on the hard disk, from which they will be run automatically in the future.

35. When the installer is finished, return the SYSTEM MEDIA diskette/tape to its cover. The Automatic Program Load Menu will redisplay.

36. You're ready to continue with the powerup now. Select the default option "1 Continue the powerup" by pressing NEW LINE.

37. When the Operating System Load Menu displays, select the default option "1 Continue immediately with operating system load" by pressing NEW LINE.

38. When the Change the System Date or Time screen appears, enter the correct date and time. The Starter Main Menu will then be displayed.

39. Select the default option "1 Start the default operating system" by pressing NEW LINE. After a few moments, AOS/VS will come up and display its log-on banner.

Now you're ready to reload user files from backup.

Reloading User Files from Backup

Once you have reinstalled AOS/VS using the instructions in the previous section, you should immediately proceed to the system-wide file restoration. Log on to the system as SYSMGR and enter SMI. Select option "2 Back up (dump) or restore (load) files" on the SMI Main Menu; then select option "4 Restore system-wide files" on the Archive Menu. (Alternatively, you could specify the keyword SYSRESTORE from the SMI Main Menu.)

When the Restore System-Wide Files screen appears, fill it in and proceed as described in Chapter 4, "Backing Up and Restoring Files."

End of Appendix

Appendix B
Keyword Summary

This appendix is for the

System Manager   [✔]

System User   [✔]

This appendix describes the keywords usable with the Starter and SMI programs. Note that the Starter keywords are valid only while you are in the Starter program, and the SMI keywords are valid only while you are running SMI.

Table B-1 contains the Starter keywords, and Table B-2 lists the SMI keywords. Each table lists the keywords alphabetically, and for each keyword includes the following information:

- Menu or menu option that it represents.

- Whether it is a menu keyword or command keyword.

- Its unique abbreviation.

- Any optional arguments.

- Whether or not the keyword and its resulting menu or command is restricted to system manager-type users (SMI only).

  (Since the System Manager alone should be running Starter, the Starter keywords apply only to the System Manager. For SMI, the keywords for options restricted to users with the System Manager privilege are noted in the last column. If other system users attempt to use a keyword for a restricted function, they will receive an error message.)

In the table, you will notice that a portion of each keyword is underlined. The underlined portion is the unique part of the keyword; that is, the fewest number of characters that you can type to specify that keyword. Note that, when future keywords are added to Starter and SMI, the uniqueness of existing keywords could change. In general, you can specify most keywords with two to four characters.

Menu Keywords and Command Keywords

Each keyword in this summary is either a *menu keyword* or a *command keyword.*

Menu keyword   Brings up a menu screen. Menu keywords do not take arguments.

Command keyword   When issued without arguments, brings up a command screen. When issued with all required arguments, immediately invokes the command. When issued with one or some required arguments, displays the command screen with the supplied arguments filled in, in the order they were typed.

When supplying arguments with a command keyword, separate each one with a space or comma.

Type an additional comma for any argument that you don't want to supply on the keyword command line if there is a subsequent argument that you do want to supply. (For example, you might forget what the first argument is, but want to supply the second, third, and fourth arguments on the keyword command line.)

For example, the DATE keyword takes arguments for date and time. Suppose you forget the required format for the date. You could enter just the time argument on the keyword command line and then enter the date argument at the command screen, which tells you the format. You could type the following:

DATE,,10:08:00

The first comma separates the command keyword from the first argument, which is a null string. The second comma separates the null argument from the second argument — 10:08:00 — which is the argument for the time. When you enter this line, the SMI will display the Change the System Date or Time screen with 10:08:00 filled in at the time input field. You can then fill in the date and press the Execute key (F1) to instruct the SMI to issue the command.

Table B-1. Alphabetical Listing of Starter Keywords

Keyword	Menu or Function	Command or Menu	Optional Arguments
BACKUP	Make a physical backup of the disk	Command	media type disk unitname
BOOTSTRAP	Logon banner	Command	None
BUILD	Build the system disk	Command	disk unitname
BYE	Exit the Starter program	Command	None
DATE	Change the system date or time	Command	date time
FIRMWARE	Load new system firmware	Command	unitname
FORMAT	Format a disk	Command	disk unitname
MAIN	Starter Main Menu	Menu	None
PROFILE	Reload the SYSMGR profile	Command	media type
RESTORE	Restore the disk from physical backup	Command	media type disk unitname
SOFTWARE	Load new system software	Command	media type
SYSDISK	Build or update system disk	Menu	None
SYSTEM	Start a different operating system	Command	pathname

Table B-2. Alphabetical Listing of SMI Keywords

Keyword	Menu or Function	Command or Menu	SYSMGR Only?	Optional Arguments
ADMIN	Administrative functions	Menu	Yes	None
ALIGN	Align the printer paper	Command	No	printer name pages
ARCHIVE	Archive (back up or restore files)	Menu	No	None
BACKUP	Back up personal files	Command	No	None
BATCH	Manage the batch queue	Menu	Yes	None
BCANCEL	Cancel a queued batch request	Command	Yes	seq. number
BCONTINUE	Continue a batch stream	Command	Yes	stream number
BDISPLAY	Display contents of the batch input queue	Command	Yes	None
BFLUSH	Terminate a currently running batch request	Command	Yes	stream number
BPAUSE	Pause a batch stream	Command	Yes	stream number
BROADCAST	Send a message to all consoles	Command	No*	message
BSTATUS	Display status of batch streams	Command	Yes	None
BYE	Exit from the SMI program	Command	No	None
CANCEL	Cancel requests in print queues	Command	No	seq. number(s)
CCLEAR	Clear consoles	Command	Yes	consolename(s)
CDEFAULT	Change the default printer form	Command	Yes	form name printer name
CDISABLE	Disable consoles from logging on	Command	Yes	consolename(s)
CENABLE	Enable consoles	Command	Yes	consolename(s)
CLEAR	Clear a hung printer	Command	No	printer name
CLI	Enter the CLI	Command	No	None
CONFIGURE	Specify system configuration	Menu	Yes	None
CONSOLES	Manage consoles	Menu	Yes	None
CONTINUE	Continue a printer	Command	No	printer name
CPL	Change the number of characters printed per line	Command	Yes	no. of chars. printer name
CREATE	Create a user profile	Command	Yes	username password sysmgr type? initial prog. initial IPC

(continues)

069-000129

Table B-2. Alphabetical Listing of SMI Keywords

Keyword	Menu or Function	Command or Menu	SYSMGR Only?	Optional Arguments
CSTATUS	Display status of consoles	Command	Yes	console(s)
CUSTOMIZE	Customize the system	Menu	Yes	None
DATE	Change the system date or time	Command	Yes	date time
DELETE	Delete a user profile	Command	Yes	username
DISABLE	Disable consoles from logging on	Command	Yes	None
DISPLAY	Display contents of print queues	Command	No	None
DOWN	Execute the DOWN macro	Command	Yes	None
DOWNCLI	Edit the DOWN macro	Command	Yes	None
FORMS	Control printer forms	Menu	Yes	None
INSTALL	Install software	Command	Yes	media type directory
LINES	Define console lines	Command	Yes	None
LOGON	Edit the system log-on message	Command	Yes	None
LPP	Change the number of lines printed per page	Command	Yes	number lines printer name
MAIN	System Management Interface (SMI) Main Menu	Menu	No	None
MEDIUM	Specify the default backup/install medium	Command	Yes	None
MODIFY	Modify a user profile	Command	Yes	username
OPCOMMAND	Send a command to the master CLI process	Command	Yes	command line
PAUSE	Pause a printer	Command	No	printer name
PCANCEL	Cancel queued print requests	Command	Yes	seq. no(s).
PCLOSE	Close a print queue	Command	Yes	queue name
PCREATE	Create a print queue	Command	Yes	queue name printer(s)
PDELETE	Delete a print queue	Command	Yes	queue name
PDISPLAY	Display status of queues	Command	Yes	None
PFLUSH	Terminate currently printing request	Command	Yes	printer name
POPEN	Open a print queue	Command	Yes	queue name
PPRINTERS	Define parallel printers	Command	Yes	None
PQUEUES	Manage printers and print queues	Menu	Yes	None

(continued)

Table B-2. Alphabetical Listing of SMI Keywords

Keyword	Menu or Function	Command or Menu	SYSMGR Only?	Optional Arguments
PRINTERS	Control printers	Menu	No	None
PROFILES	Manage user profiles	Menu	Yes	None
PROGRAM	Run a program or application	Command	No	command line
PSTART	Start a printer or print queue	Command	Yes	queue name printer name
PSTATUS	Check status of printers	Command	Yes	None
PSTOP	Stop a printer and/or print queue	Command	Yes	None
QPRINT	Print files	Command	No	pathname(s)**
RDEFAULT	Restore the default form	Command	Yes	printer name
RESTORE	Restore personal files	Command	No	None
SETUP	Edit the system SETUP macro	Command	Yes	None
SHUTDOWN	Shut down the system	Menu	Yes	None
SPACE	Display disk space statistics	Command	Yes	None
SPECIAL	Use special forms	Command	Yes	form name printer name
SYSBACKUP	Back up system-wide files	Command	Yes	None
SYSDOWN	Shut down the system	Command	Yes	None
SYSRESTORE	Restore system-wide files	Command	Yes	None
SYSTEM	Set the default system name	Command	Yes	system name
TERMINATE	Terminate user processes	Command	Yes	None
UPCLI	Edit the UP macro	Command	Yes	None
WHOS	List all processes running	Command	No*	None

(concluded)

* The menu options you perform with the BROADCAST and WHOS keywords are not restricted to system managers, but they appear only on restricted menus. Regular system users can select either option by specifying its keyword from any SMI menu.

** The QPRINT keyword accepts only file pathnames as arguments, and assumes the default queue and form name.

End of Appendix

Appendix C
Using a Hard-Copy System Console

This appendix is for the

System Manager   ☐ ✓

System User   ☐

When you run AOS/VS, you can use a display terminal, graphics terminal, or hard-copy terminal as your system console. Some system managers like to use a hard-copy terminal so that in case of error, there will be a printed record of system messages.

If you use a hard-copy terminal, and run Starter or the SMI from it, you will notice a few differences from running on display terminals. This appendix briefly describes these differences.

Using a Hard-Copy Terminal

Using a hard-copy terminal isn't quite the same as using a display terminal, but with a little practice, you should find that you get used to it very soon. This section includes some tips on using hard-copy terminals while running Starter or the SMI.

Character Echoing

Many characters echo differently on a hard-copy terminal than they do on a display terminal. For example, when you press the DEL (delete) key, it will echo as an underscore, rather than erasing the previous character, as it does on a display terminal. The key still functions in the same way, however; it just looks differently on the display.

For example, suppose you are at an SMI menu's "Enter choice:" prompt and want to enter the ARCHIVE keyword, but you misspell it and type ARCHIBE. The line, when corrected, will look like this:

Enter choice: ARCHIBE_ _VE

The first underscore echoed the first DEL, which deleted the E; the second underscore echoed the second DEL, which deleted the B. The V and E will then immediately follow the ARCHI part of the keyword.

Similarly, the ESC key echoes as a dollar sign ($). Some of the control sequences, such as CTRL-U, will echo on the hard-copy terminal. When they do, the CTRL key echoes

as a caret (^). (The CTRL key alone does not echo as a caret, however.) Other control sequences are functional, such as CTRL-A, as we describe in the "Menu and Command Screen Displays" section of this appendix.

The Cancel/Exit and Help Functions

The hard-copy terminal doesn't have function keys. Two functions that you use function keys to perform on display terminals running Starter and SMI are Cancel/Exit and Help. You might remember from the system startup portion of this manual that, during the early stages of powerup, you can press ESC for Cancel/Exit and H for Help. However, since alphabetic characters indicate keywords in Starter and SMI, you will have to use special escape sequences to perform these functions from a hard-copy terminal while running Starter or SMI.

To perform the Cancel/Exit function, which returns you to the previous menu or command screen from the current screen, use ESC-C. Press the ESC key, and then press C. This sequence will echo as $CANCEL/EXIT. For example, suppose you are at the SMI's Control Printers screen and you want to return to the Main Menu. The "Enter choice:" prompt has the default response, 1, displayed after it. If you press the ESC-C sequence, the line will then look like this:

Enter choice: 1$CANCEL/EXIT

The SMI Main Menu will then print.

Similarly, if you want Help text at any time, you can issue the ESC-H sequence. Press the ESC key, and then press H. The entire Help text relevant to the current prompt will print, and then the prompt will reappear. If you want to see the entire menu or command screen again, press the ERASE PAGE key and it will print again.

Like the Cancel/Exit escape sequence, the Help escape sequence echoes as $HELP. For example, suppose you are at the prompt for media type at the Back Up Personal Files screen. If you type the Help escape sequence, the line will then look like the following:

Back up to tape or diskette? (T = Tape, D = Diskette) $HELP

The Help text for this prompt will then print.

Starter and SMI Menu and Command Screen Displays

When you run Starter or the SMI on a hard-copy terminal, the menus and command screens will be different from the way they look on display terminals. Each screen will print out completely, and then each prompt for input will print again, in turn, at the bottom of the display. Menus and command screens work somewhat differently.

Menu Displays

When the first menu is displayed on a hard-copy terminal, the entire menu will print, including the status line, the "Enter choice:" prompt, and the lines explaining how to use the Cancel/Exit and Help keys. The next time a menu or command screen is displayed, however, the status line and the lines about Cancel/Exit and Help will not appear. (You can make them appear any time by pressing the ERASE PAGE key, which reprints the entire screen.)

When the "Enter choice:" prompt is not the last line on the display, it will be redisplayed at the bottom of the printout, complete with the default choice. For example, the printout for the SMI Main Menu will look like Figure C-1.

```
                System Management Interface (SMI) Main Menu

=>   1  Run a program or application
     2  Control printers
     3  Back up (dump) or restore (load) files
     4  Run administrative functions

     Enter choice: 1


To exit from any menu, press ESC and then C
For assistance at any time, press ESC and then H

     Enter choice: 1
```

Figure C-1. SMI Main Menu as Displayed on a Hard-Copy Terminal

You will be positioned at the bottom "Enter choice:" prompt. You can then type a number, use the arrow keys (if present), or type a keyword, just as you would do at a regular display terminal. Whatever you type will be echoed on the next line, complete with the "Enter choice:" prompt. For example, suppose you press the downarrow (or Cursor Down) key. The last two lines of the hard-copy display will then look like this:

Enter choice: 1
Enter choice: 2

If you then pressed NEW LINE, you would choose option "2 Control printers," and see the Control Printers Menu print.

If you type a keyword, the entire word will display on a new line as you type it. For example, suppose after pressing the downarrow, in the example above, you decide you want to see the Control Printer Forms Menu. Instead of pressing NEW LINE, you type the keyword FORMS, as follows:

Enter choice: 1
Enter choice: 2
Enter choice: FORMS

You could then press NEW LINE to display the Control Printer Forms Menu.

Command Screen Displays

Command screen displays are similar to menu displays, but when there are multiple prompts, they are a little trickier. The entire command screen will be displayed, complete with default responses, and then the first prompt will reappear at the bottom of the display, but without its default choice. You can display the default by issuing a CTRL-A sequence. (You can also display the default response after you've typed some characters, if you first delete the typed characters. You might do this if you first wanted a nondefault response, and subsequently decided you wanted the default after all.)

For example, suppose you, as user SYSMGR, issue the BACKUP keyword from an SMI menu. The Back Up Personal Files screen will print as shown in Figure C-2.

```
                      Back Up Personal Files

Back up to tape or diskette? (T = Tape, D = Diskette)      T


Back up from which directory?   :UDD:SYSMGR


To back up all files, press NEW LINE. To back up specific
files, type their pathnames, or use templates.


File(s):


Send a list of backed up files to the printer, to a disk
file, or don't create a list? (P = Printer, F = File,
N = None):                                                P


Back up to tape or diskette? (T = Tape, D = Diskette)
```

Figure C-2. Back Up Personal Files Screen on a Hard-Copy Terminal

Suppose you want to accept the default backup media, which is tape. You could type T
or press CTRL-A at the prompt. Like the display terminal, which takes the T and echoes
it as TAPE when you press NEW LINE, the hard-copy terminal will redisplay the prompt
line with the entire word TAPE printed. It will then display the next prompt. For example,
let's say you pressed CTRL-A and then NEW LINE at the prompt. The last few lines
of the display would then look like this:

Back up to tape or diskette? (T = Tape, D = Diskette)   T

Back up to tape or diskette? (T = Tape, D = Diskette)   TAPE
Back up from which directory?

Suppose you again press CTRL-A to display the default directory. The last few lines will
then look like this:

Back up to tape or diskette? (T = Tape, D = Diskette)   T

Back up to tape or diskette? (T = Tape, D = Diskette)   TAPE
Back up from which directory? :UDD:SYSMGR

You decide you really want to back up the files in :UDD:SYSMGR:REPORTS, so you
can simply add :REPORTS to the end of :UDD:SYSMGR, and press NEW LINE. The
last few lines will then look like this:

*Back up from which directory? :UDD:SYSMGR:*REPORTS

Back up from which directory? :UDD:SYSMGR:REPORTS
File(s):

You can see that the next prompt also appears. Note that its preceding text does not
appear. This is a feature of the hard-copy functionality — only the line of the prompt
with the input field will appear. This can become confusing, as with the next prompt,
which is for the destination of the list of backed up files. It will display as follows:

N = None):

When you see a prompt like this and aren't sure what it's asking, refer back to the original display of the whole screen. (Or you can press ERASE PAGE and the entire screen will redisplay.) By looking at the whole screen, you can see that the full prompt reads as follows:

Send a list of backed up files to the printer, to a disk
file, or don't create a list? (P = Printer, F = File,
N = None):   P

You can then enter the appropriate response.

Benefits and Restrictions of the Hard-Copy Terminal

From the descriptions above, you have probably already noted some of the advantages and disadvantages of using a hard-copy terminal to run Starter or SMI. This section will briefly summarize them.

Advantages

Having the ability to run Starter and SMI on a hard-copy terminal has the following advantages:

- It allows a user to work on the system console, even when it isn't a display terminal.

- The hard-copy terminal provides a printed record of all errors and user actions.

Disadvantages

Some disadvantages to running Starter and SMI on a hard-copy terminal are the following:

- Some characters echo differently on a hard-copy terminal than on a display terminal.

- You must use escape sequences to perform the functions performed by the Cancel/Exit and Help function keys on a display terminal.

- Prompts that take up more than one line are displayed in full only when the entire screen is displayed. Just the line containing the input field is displayed when you must enter a response.

- Seeing a prompt appear more than once can be confusing.

- The SMI system management tutorial is not an option on hard-copy terminals.

End of Appendix

Glossary

This glossary describes computer-related terms that may be new to you — either as words or in relation to Data General Corporation (DGC) software products.

abort
Terminate abruptly. The result of a serious error condition. When a program (like SMI or the CLI) encounters an error, it might display a warning, error, or abort message. The abort message is the most serious of the three; it means the error was so serious that the program couldn't continue.

access control list (ACL)
A list associated with every directory and file, which specifies the type of access allowed for any user. The access types include O (Owner), W (Write), A (Append), R (Read), and E (Execute).

Advanced Diagnostic Executive System (ADES)
A system of hardware diagnostic programs. AOS/VS for MV/2000 DC and DS/7000-series systems comes with a subset of ADES tests. You can optionally purchase the complete ADES.

ANSI
American National Standards Institute: a committee that publishes standards for a large range of things, including computer languages and tapes, machine screws, and copiers.

AOS (Advanced Operating System)
DGC Advanced Operating System for 16-bit ECLIPSE computers.

AOS/VS (Advanced Operating System/Virtual Storage)
DGC Advanced Operating System for ECLIPSE MV/Family and DS/7000-series 32-bit computers.

archive
To back up files for safekeeping. Archive is also used to mean the actual set of tapes or diskettes containing the backed-up files.

argument
Something that is acted upon by a command, statement, or instruction. For example, in the command line QPRINT MYFILE, MYFILE is an argument to the QPRINT command. In the command line PRINT Hello, Hello is an argument to the PRINT statement.

ASCII
American Standard Code for Information Interchange. This code establishes standard numeric values for each character used in text: the numbers range from 000 for the Null character to 177 (octal) for the DEL character. Some DGC terminals have an international character set, which extends the ASCII set to include non-U.S., language-specific characters (for example, the U.K. currency symbol and mathematical symbols such as the Greek letters alpha and beta).

asynchronous communications board
An optional circuit board that you can buy for your MV/2000 DC or DS/7500-series system, which allows you to use asynchronous communications lines. You can put consoles, serial printers, and modems on asynchronous lines.

asynchronous line
A communications line that uses an asynchronous protocol (or structure) to transmit characters. In such a protocol, each character has its own *framing* information: traditionally one start bit (before the character) and one stop bit (after the character). Asynchronous lines are generally used for terminals and for intersystem communication. They use less system resources than synchronous lines, but are not as fast.

back up
To copy files onto magnetic diskettes or tape for safekeeping. Backing up files is also referred to as archiving.

backup
Files copied for safekeeping, usually onto magnetic diskettes or tape. A backup set of tapes or diskettes is also referred to as an archive.

bad block
On the magnetic surface of a disk or diskette, a bad block is a flawed area that won't hold information. The Disk Formatter notes such areas so the operating system will avoid them. If AOS/VS encounters a new bad block, it displays a HARD ERROR message.

BASIC language (Beginner's All-purpose Symbolic Instruction Code)
An easy, interpreted language, originally developed at Dartmouth College. Data General has several versions of BASIC: VS/BASIC, Extended BASIC, and Business BASIC, which has special business and ISAM capabilities.

batch
The technique of processing in a continuous, noninteractive stream. Batch jobs do not require a terminal and execute without user interaction (for example, overnight); they are suitable for big, well-defined tasks, like large payroll jobs. You can tell AOS/VS to run an operation in batch via the CLI QBATCH command (described in the CLI manual). You can manipulate the batch queue on MV/2000 DC and DS/7000-series systems via an SMI menu.

baud
The rate at which a line or modem can transfer data, in bits per second. Normally, each character is transmitted using 10 bits, so characters are transferred at 1/10 the baud rate. The standard (and default) baud rate for terminals is 9600 (960 characters per second). For modems it is 1200. For communication lines that are directly connected, the default is 4800 baud. You specify the baud rate for each line on your MV/2000 DC or DS/7000-series system via SMI's Specify System Configuration menu.

bit
A *Bi*nary dig*IT*, the smallest unit of information that a computer handles. A bit can assume one of two values: 0 or 1. But 16 bits, as used in a DGC computer word, can indicate 65,536 different numbers. And 32 bits, in two computer words, can indicate over 4 billion numbers.

block; *see* disk block.

bug
An error in a program.

boot or **bootstrap**
Start up an operating system. A *bootstrap program* is a program that reads other, larger programs (like operating systems) into the computer's memory.

bpi
Bits per inch (b/in). A measure of data density on magnetic tape.

break sequence
A control sequence that involves pressing the CMD and BREAK keys simultaneously (or the BRK, or BREAK, key alone on some terminals). When typed on the system console, the break sequence removes the console from AOS/VS and gives control to the SCP CLI. On MV/2000 DC and DS/7000-series systems, you can restore control to AOS/VS by entering CONTINUE at the SCP CLI prompt. On user terminals, the break sequence generally has no effect; but it allows you to use control characters in some programs (such as CEO and SLATE) that otherwise don't recognize them.

breakpoint
A place where a debugger stops program execution. At a breakpoint, you can examine current values of variables. The DGC high-level language debugger is the SWAT® debugger.

bus
A connection between hardware components of a system, which transfers data between the components.

Business BASIC
An enhanced, business-oriented version of the BASIC language.

byte
8 bits, capable of storing one ASCII character (for example, A) or any number from 0 to 255.

CAD (computer-aided design)
Using computers to produce diagrams for complex plans; for example, integrated circuits in computer chips.

CAE (computer-aided engineering)
Using computers to aid in engineering design. *See also* CAD (computer-aided design).

CAI (computer-aided instruction)
Using computers as educational tools. The interactive system management tutorial that comes with AOS/VS for MV/2000 DC and DS/7000-series systems is an example of CAI.

CAM (computer-aided manufacturing)
Using computers to aid in manufacturing processes.

central processing unit (CPU); *see* processor.

CEO
The DGC Comprehensive Electronic Office system, which includes electronic mail, calendar, filing, and word processing. A subset product, CEO Word Processing - Independent, offers word processing.

CLI (Command Line Interpreter)
The AOS, AOS/VS, and AOS/DVS command language. CLI commands allow you to communicate with the operating system. They provide control, help maintain files, execute other programs (like CEO or SMI), and do many other things. When you start AOS/VS, it runs a CLI process as PID 2 on the system console. This is the *master CLI*, from which all subordinate (son) processes are created.

CMD key
A key on some terminal keyboards that by itself does nothing, but (like the CTRL and SHIFT keys) with other characters can do things like take user terminals off-line and put them on line. (*See also* break sequence.)

COBOL
The COmmon Business Oriented Language, a very popular programming language for business. It features English language construction, with paragraphs, sentences, and clauses. DGC offers VS/COBOL and Interactive COBOL.

cold start
A computer system startup that begins with computer power off, as compared to a warm start. The powerup we describe in this book is for a cold start.

command
A keyword, possibly having arguments, that tells the CLI or another DGC product what to do.

command keyword
A word that, when entered at a Starter or SMI menu screen, directs the program to proceed directly to a command screen without going through the intervening menu screens first. (The CLI and other DGC products also use command keywords.)

You can enter arguments with a command keyword and the Starter or SMI program will fill them into the fields on the command screen. For example, if you specify DATE 04-JUN-86, the program will bring up the Change the System Date and Time screen with the value you specified already filled in to the date input field.

compiler
A program that translates statements in a high-level programming language (like FORTRAN or COBOL) into binary code (instructions and data) for the computer. The Link program then turns the binary code into an executable program.

*

console
Another name for terminal. In this book, the operator's terminal is called the system console; the word console refers to both user terminals and the system console.

control key; *see* CTRL key.

control point directory
A directory file that was created with a specified maximum size. (*See also* directory.)

CPU (central processing unit); *see* processor.

crash
Halting of a computer. Can be caused by a power failure or surge, or a panic, among other things. *See also* panic.

CRT (Cathode Ray Tube)
A terminal with a keyboard and television-like video screen that displays characters. A display terminal.

CTRL key
A key, like the SHIFT or CMD key, that does nothing by itself but can do a lot with other keys. CTRL sequences are used for cursor control, to suspend and restore screen display, and to interrupt commands and programs.

cursor
On a terminal screen, a small marker (such as an underscore or block) that indicates the current position on a line. The cursor is analogous to the position of a pencil point on paper.

data tablet
A large tablet with an electric grid beneath its surface that uses either a cursor puck or a stylus to generate input signals.

database
An information structure (usually kept in one or more files) that a program requires for proper operation. For example, CEO has a database for its Electronic Mail, and another database for Electronic Filing. Each of these databases involves a number of files that interrelate in a way that's meaningful to CEO.

data-sensitive record
A type of record delimited by a special character. Some standard delimiters are NEW LINE (shown in this book as ⏎) and form feed.

deadlock
A condition in which a system is frozen or hung: unable to act or respond. Usually you must break a deadlock manually (CMD and BREAK keys, and then use the SCP commands RESET and START 50 to shut down).

debugger
A utility that can help you find program errors and understand the details of program execution. A debugger allows you to run another program, set breakpoints, stop execution at the breakpoints, and examine and change variables in the program. There are several debuggers, including SWAT for high-level languages, and DEBUG4, the assembly language debugger.

dedicated line
A phone line installed and used exclusively for communication between computer systems. Communication over a dedicated line is faster, more precise, and more expensive than communication over a switched line.

default or **by default**
A value or parameter that a program uses if you don't specify otherwise. For example, the default operating system is the one that came pre-loaded on your disk; that is, AOS/VS. You are free, however, to run another if you have loaded it onto your system.

delimiter
A special character that ends each data-sensitive record in a file. The system treats all characters up to the next special character as a record. A common delimiter is the ⏎ (NEW LINE) character. When you type a CLI command, the NEW LINE you press at the end is the delimiter.

device name
A symbol or name that the operating system uses to identify a device, such as a disk, tape, or diskette drive. On MV/2000 DC and DS/7000-series systems, the device name for the primary disk unit is @DPJ0, the diskette drive is @DPJ10, the model 6351 tape drive is @MTJ0, the primary model 6352 or 6341 tape drive is @MTJ10, and a second model 6352 or 6341 tape drive is @MTJ11.

DFMTR
The filename of the Disk Formatter, an AOS/VS utility program.

DG/VIEW
A software product that provides an environment in which you can run several applications at the same time and interact with each program through its window. Using DG/VIEW, you can arrange your windows to suit your needs and transfer data from one window to another. (*See also* window.)

diagnostic program
A test program that you run to determine the source of a hardware failure, or a potential failure. The MV/2000 DC and DS/7000-series systems run some diagnostic programs automatically at powerup. You can optionally purchase the ADES system to run more complete tests. (*See also* Advanced Diagnostic Executive System (ADES).)

directory
A file whose sole function is to contain other files. Directories can help you organize and keep track of your files; the system itself uses them for this purpose. (*See also* root, user, *and* UTIL.)

DISCO
A display program that shows how full your disk is and how many disk cylinders are crossed during a seek to fulfill a read or write request to the disk. DISCO can help determine if you have file fragmentation. (*See also* fragmentation.)

disk (hard)
A fast mass storage device, with metal platters that rotate rapidly. The platters have a magnetic coating that is written to and read from. The operating system, all its directories and files, and all user directories and files are generally stored on hard disk.

diskette
A flexible disk, with magnetic coating on plastic, ranging in size from 3 to 8 inches. The standard diskette for MV/2000 DC and DS/7000-series systems is 5-1/4 inches (a common size) and holds 737 Kbytes. It is a double-sided, double-density diskette. Diskettes are also known as floppy disks.

disk block
An area on a disk that contains 512 bytes of storage.

Disk Formatter (DFMTR)
An AOS/VS utility program that formats diskettes and hard disks, and checks disk surfaces for flaws (bad blocks).

display terminal
A terminal consisting of a keyboard for input and a television-like screen for output. *See also* hard-copy terminal.

document
In CEO, this is a file, created via the CEO Word Processor, that contains text. It can be edited, mailed, filed, formatted, printed, or deleted.

dot-matrix printer
A printer that produces copy in which the characters are composed of many tiny dots and have an easily discernable dot pattern.

drawer
In CEO, each user has a *cabinet* in which he or she can create drawers. Within drawers, the user can create *folders*, and within folders, documents. Cabinets, drawers, and folders are office-oriented names for AOS/VS directories, as documents are for AOS/VS files.

dump
In data processing, dump means to copy . Often the copy is done for safekeeping, as for backup. Sometimes a dump is done to help discover the source of a problem, as in a core dump (which copies the computer's memory to diskettes or tape, so that programmers can examine it).

echo
To confirm a character by displaying it. For example, when you enter a character via the keyboard, AOS/VS reads it and echoes or displays it on the terminal screen (unless the character is part of a password, which AOS/VS doesn't echo, to preserve privacy).

Emergency Shutdown (ESD)
A part of AOS/VS that performs some administrative cleanup, updating and releasing the disk(s) and allowing immediate restart of AOS/VS. ESD is primarily useful after an AOS/VS panic (fatal error). You can run it after a panic by answering Y when prompted. (ESD is also an acronym for ElectroStatic Discharge, which pertains to static electricity, like lightning, and its effect on computers.)

emulator
A program that enables a terminal or computer system to act like a specific (other) type of terminal or system.

EXEC
An AOS utility program that manages printer and batch queues and user terminals, if any.

fatal error
When a running program or operation encounters an error so severe that it cannot recover, and the program terminates or is terminated (usually by the system). *See also* panic.

father
A superior process. For example, the EXEC process is the father to all user processes; EXEC creates the subordinate processes.

FCU; *see* Forms Control Utility (FCU).

field; *see* input field.

field engineer
A DGC engineer whose primary responsibility is servicing hardware.

Field Replaceable Unit (FRU)
A piece of hardware, usually a circuit board, that a field engineer can replace on site. The diagnostic programs that run at powerup time on MV/2000 DC and DS/7000-series systems isolate faults to responsible FRUs.

file
A collection of information stored under a filename. Some device filenames are rigidly defined (for example, @DPJ0 for disk); but user filenames are flexible.

File Transfer Agent (FTA)
The XODIAC network file transfer agent. It helps copy files from one computer system to another.

filename
AOS/VS filenames can be from 1 to 31 characters, including letters, numbers, underscore (_), period (.), $, and ?. Usernames can be from 1 to 15 filename characters.

firmware
Instructions that control some aspect of computer hardware.

FIXUP
An AOS/VS utility program that repairs a disk or diskette when it has not been released properly. To properly close, a hard disk requires an AOS/VS shutdown (normal or emergency). On MV/2000 DC and DS/7000-series systems, FIXUP runs automatically when you attempt to start up after an abnormal shutdown.

floating-point unit (FPU)
A board that speeds up computations with floating-point numbers (numbers that have a decimal point). MV/2000 DC and DS/7000-series systems have an integral hardware floating-point unit. Systems without an FPU use firmware for floating-point operations.

floppy or floppy disk
Nickname for a diskette.

form feed
A character (CTRL-L) that tells the printer to stop printing on the current page and start at the top of the next page. Sent to the terminal screen, a form feed clears the screen.

format
The predetermined arrangement of characters, fields, lines, page numbers, punctuation marks, etc. Refers to input, output, and files. You can create print formats with the Forms Control Utility (FCU).

formatting a disk
Writing information on a disk or diskette, allowing the operating system to read and write to it. Hardware formatting creates disk blocks (sectors) on the disk or diskette. All disks and diskettes must be hardware formatted, no matter how you plan to use them. Data General diskettes are preformatted, so you do not need to format them yourself.

Software formatting writes tables on a disk or diskette that AOS/VS needs to access the disk as a directory. It also creates a bad block table that allows AOS/VS to cope with bad blocks on the disk or diskette.

Forms Control Utility (FCU)
A utility program that allows you to create special forms to use for printing files.

FORTRAN
Contraction of Formula Translator, FORTRAN is one of the oldest and most popular programming languages. There are three different FORTRAN compilers available for DGC systems: FORTRAN 77 (the most modern FORTRAN, nicknamed F77), FORTRAN 5, and FORTRAN IV.

fragmentation, file
Storage in fragments. Generally, when the disk is over 70 percent full, files are often stored in fragments all over the disk (wherever AOS/VS can find space). This can slow system performance.

freeze
To stop, usually referring to the terminal screen. For example, when the terminal is in Page Mode, it will display output, and then freeze the screen when it is full. To make the screen continue scrolling, you must issue the CTRL-Q sequence.

FRU; *see* Field Replaceable Unit (FRU).

FTA; *see* File Transfer Agent (FTA).

function key
One of the keys in the topmost row of a terminal keyboard (up to 15), plus the keys labeled C1 through C4. Each key, alone or in conjunction with the SHIFT and/or CTRL keys, can represent a command. (Pressing a key is easier than typing a command.) A software product's function key definitions (if it has any) are sometimes identified by a shaped template card that often fits over them.

GMT offset
The number of hours and minutes you would add to local time to equal Greenwich Mean Time. The GMT offset can be used to synchronize times between systems in a network that are in different time zones.

Graphics Instruction Set (GIS)
A hardware option for some DGC computers, which works in conjunction with Data General's GKS to produce graphics and enable mouse operations.

Graphical Kernel System (GKS)
A collection of industry standard graphics-creating routines, which allow FORTRAN 77 or PL/I programs to draw pictures.

Greenwich Mean Time (GMT)
The international time standard, on which some computers base all system times when you connect systems in a network over different time zones. You must enter a GMT offset when using this capability.

hang
A deadlock or infinite loop situation, in which a system is frozen. *See also* deadlock.

hard-copy terminal
A terminal that uses a keyboard for input and a printer for output; as opposed to a display terminal, which uses a video screen for output. Many installations use a hard-copy terminal as the system console so they will have a permanent record of all system and error messages.

hardware
The physical components of your computer system, as opposed to the programs such as diagnostics, AOS/VS, and the SMI, which are software.

hardware diagnostics
Test programs designed to identify current and potential problems with hardware, such as disks. ADES includes series of hardware diagnostic programs.

hardware formatting; *see* formatting.

hierarchy (process)
All processes are related in a structure that resembles an upside-down tree. The highest AOS/VS processes are the peripheral manager process (PMGR, PID 1) and the master CLI process (PID 2).

Via the UP macro, the master CLI creates subordinate processes (like INFOS and X25). EXEC, which is usually PID 3 under AOS/VS, creates user processes (the ones that run on user terminals when people log on). Most processes can create other, subordinate, processes (called sons); if so, the creating (or superior) process is called the father. The master CLI is the father of EXEC, which is the father of all user processes. When a process terminates, so do all of its sons; thus, if you terminate EXEC, you terminate all user processes on the system.

host
A computer system on which you are running. The term typically implies networking, in which the local host is the system you are physically connected to, and the remote host is one that you are connected to via a network.

IAC (Intelligent Asynchronous Controller)
A device that handles user terminals and serial printers. An IAC is also sometimes referred to as a LAC (Local Asynchronous Controller).

INFOS II
A file management system that lets users create, maintain, and use large databases, via COBOL, Business BASIC, PL/I, or FORTRAN 77 application programs. INFOS II is a superset of an ISAM file system. CEO (the full product) requires INFOS II.

initialize
A general-purpose computer term meaning to do whatever is necessary to bring something to a desired initial state or starting point. For example, to initialize a disk means to introduce it to the AOS/VS file system.

input field
An area on the screen in which the user is expected to enter input. For example, the Change the System Date or Time screen has two fields: the date field and the time field.

INSTL
An AOS/VS utility program that installs bootstrap software and/or an AOS/VS operating system on a disk. The INSTL utility installs software on the disk outside of the AOS/VS filesystem. When you install other software on the disk, you normally load it within the AOS/VS filesystem.

interface, user
How the computer interacts with the user; including the screens that it outputs and the way it reacts to user input.

I/O (Input/Output)
The process of reading information from a device into the computer's main memory (input) and/or writing information from memory (output). The input can come from (and the output go to) disk files, diskettes, tape, a terminal, telephone lines, or microwave beams.

ISAM
Indexed Sequential Access Method. This is a file structure used by INFOS II.

Janitor (CEO)
A CEO utility program that deletes documents and cleans up the mail directory.

Kbyte
Abbreviation for kilobyte. In terms of computer memory, 1,024 bytes (1,024 characters). 1K is a number equaling 1,024 (decimal). In terms of disk storage, a kilobyte means 1,000 bytes. MV/2000 DC and DS/7000-series systems use 737-Kbyte diskettes. A 737-Kbyte diskette holds 737,000 characters.

keyword
A command or symbol that instructs a program to proceed directly to a particular menu, command, or screen without going through any intervening steps first. The Starter and SMI programs have menu and command keywords.

labeled tape or **labeled diskette**
A magnetic tape or diskette with a label that names the contents of the tape or diskette, including the volume ID (VOLID). This label is a part of the data on the tape or diskette itself, as opposed to the paper label you might stick on the tape cartridge or the diskette's outer envelope. The backup and restore procedures described in Chapter 4 use tape labels.

LAN; *See* local area network (LAN).

laser document printer
A printer that produces high-quality copy that resembles typeset copy.

LDU
A logical disk unit; one or more physical disks, processed by the Disk Formatter into one logical disk.

LED
Abbreviation for light emitting diode. The DS/7700 system's seven-segment digital LED display consists of seven bars that, when lit in various combinations, display different numbers and letters.

letter-quality printer
A printer that produces copy suitable for a business letter. The copy resembles typewritten copy.

line (communications); *see* asynchronous line *or* synchronous line.

line (of text)
A sequence of ASCII characters that ends with either a NEW LINE, form feed, or null character.

link entry
A file whose sole function is to indicate another file's pathname, created with the CLI CREATE/LINK command. For example, a link named MAR to the file :UDD:CHRIS:MARCH_REPORT makes access to MARCH_REPORT easy; for example, to type out the file from the CLI you can just enter TYPE MAR)..

local area network (LAN)
A network of computer systems that are relatively close to one another — up to a mile apart.

local (item)
An item (like a terminal or CEO database) that is managed by your computer system without a communications line. The complement of local is remote. For example, CEO can be configured with a local or remote Mail database. And a local terminal is attached directly to your system, while a remote terminal is attached via a modem.

log in
An alternate term for the phrase *log on.*

log on
To pass a recognition procedure and be accepted by a computer system. For example, to log on to a user terminal under AOS/VS, you type your username and your password. The log-on concept is designed to provide security and privacy for files, and to prevent unauthorized people from using a computer system.

macro
A sequence of instructions or commands that can be called (accessed) by a single name; it may or may not require arguments. Macros are primarily timesavers, allowing people to write a series of commands only once, and then execute them all by one name.

magnetic tape
A medium used for software distribution and file backup. DGC makes both cartridge types, such as models 6351 and 6352, and reel tapes, like model 6341, for MV/2000 DC and DS/7000-series systems.

manager, system
The person who plans and administers a computer system, deciding (among other things) who will be allowed to use the system and what privileges each user will have.

master CLI; *see* CLI *and* hierarchy.

Mbyte
Abbreviation for megabyte. In terms of computer memory, 1,048,576 characters. Two megabytes of main memory can hold 2,097,152 characters. In terms of disk storage, a megabyte means 1,000,000 bytes. A 15-megabyte disk can hold 15,000,000 characters. A 38.6-megabyte disk can hold 38,600,000 characters. And a 71.2-megabyte disk can hold 71,200,000 characters.

menu
A list of options from which you can choose what you want to do by entering a number or, if a default is shown, just by pressing the NEW LINE key.

menu cursor
An arrow symbol that appears to the left of an option on a Starter or SMI menu, indicating the current default option. When you type a number or press the uparrow or downarrow key, the menu cursor moves so it points to the appropriate menu entry.

menu keyword
A word that, when entered at a Starter or SMI menu screen, instructs the program to proceed directly to a particular menu without going through the intervening menus first.

microcode
Microinstructions that implement the instruction set of a computer.

modem
A device that connects a remote terminal to a computer over a telephone line. (Short for "MOdulator DEModulator.") One modem is needed at each site. From the remote site, you dial the destination computer's number, wait for a tone; then connect the modem (either via a switch or by inserting the phone receiver into the modem).

monitor
The system console display screen.

motherboard
A board in a computer on which one or more smaller boards are mounted.

mouse
An input device that you move across a flat surface. Movements are translated as coordinates, which a program then uses to move a cursor or draw a picture.

multiplexor
A board that allows a computer system to manage a communications line and user terminals. It sorts the incoming signals for the computer, and ensures that the computer's response goes to the right line.

network
A group of computer systems that can communicate via a communications link. Broad-based networks can include different manufacturers' systems. The XODIAC network system, with X.25 interface and agents, allows large DGC systems to participate in a general Public Data Network (PDN), or private or local area network with small systems.

network administrator
A person in charge of managing the communications among the systems connected via a network. This person should be very familiar with the XODIAC product.

NEW LINE
A character (produced by pressing the NEW LINE key, shown as) in this book) that ends a line of text and starts the next line. It terminates input to SMI and commands to the CLI and other programs.

on-line
In direct communication with the computer and under its control. For example, when a terminal is on-line, the computer reads from the terminal keyboard and writes to its screen. When a terminal is off-line, the computer cannot communicate with it.

operating system
A large program that manages and operates devices and processes for users and user programs.

operator, system
The person who physically operates a computer system. Small computer systems might not have a system operator.

page-milliseconds
Indicates a process's memory usage in relation to time: formed by multiplying the number of memory pages used by the number of CPU milliseconds used. The REPORT utility gives this figure for processes.

panic
What happens when an operating system hits a fatal error condition (an error so serious that the system cannot or dares not recover from it). The system console then prints a fatal error message; and you run a routine called ESD; then restart.

parallel printer
A type of printer that has eight data lines between the printer and the processor. This allows 8 bits (1 byte) of information to reach the printer at a time, as opposed to a serial printer, which receives just 1 bit at a time.

parent directory
The directory immediately above another directory; for example, the parent directory of :UDD:SYSMGR is :UDD, and the parent of :UDD is : (the root).

password
A combination of characters that, used in conjunction with your username, allows you to log on to AOS/VS from a user terminal or access a remote system. Passwords can be 6 - 15 characters and can contain any printable character except a caret (^).

patch
A correction or update made to a program on disk. DGC sometimes provides patch files in updates for AOS/VS programs like EXEC and the CLI, in addition to system patches.

pathname
A path, usually including directory names, from the root directory to a file. For example, :UDD:ASHLEY:PROJDIR:FILE1 is a pathname.

PCOPY
A fast copy program that makes a physical copy of all used sectors of a disk, in order, onto another disk or diskette or tape. You can use PCOPY to back up or restore your hard disk to tape or diskette on MV/2000 DC and DS/7000-series systems via the Starter Main Menu.

peripherals directory (PER)
The system directory that holds entries for all devices, such as terminals and printers. Its full pathname is :PER or the prefix @. The prefix @ that you use with devicenames and queuenames specifies the peripherals directory.

PID (Process ID)
The number that the system creates to identify a process. Under AOS/VS, PID 1 is the peripheral manager (PMGR). PID 2 is the master (parent or operator) CLI process. PID 3 is usually EXEC. Every process has a PID.

pixel
One of the tiny dots that make up the display on a terminal's video display screen. On graphics terminals, the more pixels per square inch, the better the picture resolution.

pixel-mapped terminal
A graphics terminal.

PL/I
Programming Language I, a compiled, high-level language.

port
In hardware context, a plug at which you can connect a cable to transfer data between a computer and another unit. For example, MV/2000 DC and DS/7000-series systems have a parallel printer port.

PREDITOR
The user profile editor supplied with AOS/VS, which creates user profiles that identify system users to EXEC and allows them to log on and off. Note that you can assign two ready-made profile types — System User and System Manager — to your users via SMI's Manage User Profiles Menu on MV/2000 DC and DS/7000-series systems.

pregen
A pregenerated (ready-made) version of a program. A pregenerated operating system makes life easier for the user. AOS/VS for MV/2000 DC and DS/7000-series systems has an operating system pregenerated and ready-to-use, but you can generate your own system if you want to.

PRESENT® facility
An information retrieval program, available with the CEO Electronic Office and/or INFOS II. The PRESENT facility can obtain stored information and, via the TRENDVIEW® graphics package, create pictures from it.

printer
A printing device. Several printers are available to use with MV/2000 DC and DS/7000-series systems, including models 4558 and 6216 parallel printers, and models 4557 and 6215 serial printers. You can place files in a print queue via an SMI menu option on the Control Printers Menu.

process
An executing program.

processor
Sometimes called the central processing unit (CPU), the processor is one of the three portions of a computer system. The others are Input/Output and Main Memory. The processor decodes and executes program instructions, performs arithmetic and logical operations, and holds a small amount of data it is currently working with in accumulators.

profile *See* user profile.

program
A series of instructions, translated into binary codes, that the computer can execute. Word processors, text editors, Starter, SMI, the CLI, and the operating system itself are all programs.

protocol
A set of conventions between communicating programs that defines the format and sequence of messages to be exchanged.

pseudomacro
A CLI construct designed to make macros more useful; returns a value. For example, [!DATE] returns the current date.

queue
A file designed to hold print and batch requests until the printer and system are ready to process them. SMI menu options let you display and manipulate queue contents.

record
A series of one or more bytes or characters written to or read from a file.

Release Notice
Notice of recent software changes that DGC hasn't yet been able to include in pertinent manuals, supplied with AOS/VS and other software as a printed listing.

remote (item)
An item (like a system, terminal, or CEO database) that is managed by another computer or by your computer over a communications line. The complement of remote is local. For example, CEO can be configured to run with a remote Mail database. And a remote terminal is one attached to your system via a modem (instead of directly).

Resource Management Agent (RMA)
The XODIAC network Resource Management Agent. It allows people on one system to use devices on other computer systems, and to move files to another system. *See also* network.

revision
A version of AOS/VS (or other software) and manuals, or a version of microcode. DGC issues a new revision of AOS/VS about every 6 months, sending it to customers on the Software Subscription Service.

RMA; *see* Resource Management Agent (RMA).

root directory (:)
The system master directory that contains and gives access to all other directories.

SCP; *see* System Control Program (SCP).

scroll
To move the text on a terminal screen up or down (or left or right) so that some text moves off the screen and some more text moves onto the screen.

search list
A list of directories that the operating system will scan whenever it can't find the specified file in the working directory; established with the CLI SEARCHLIST command.

sector; *see* disk block.

serial printer
A type of printer that has one data line between the printer and the processor. This allows just 1 bit of information to reach the printer at a time, as opposed to a parallel printer, which receives 8 bits (1 byte) at a time.

SMI; *see* System Management Interface (SMI) program.

software
Computer programs that make the computer function. Software includes such things as word processors, operating systems, text editors, and products like CEO and INFOS II.

software formatting; *see* formatting.

Software Subscription Service (SSS)
A service that provides new revisions of AOS/VS and support software as DGC creates them. Membership is available with MV/2000 DC and DS/7000-series systems.

Software Trouble Report (STR)
A formal report, made by a customer to DGC through a DGC service area or engineer, about a serious problem that the customer is having with the software. The cause may be a user or DGC error. DGC personnel try to duplicate the problem to solve it, and thus need as much information about the problem as possible. Or instead of reporting errors, an STR can simply offer suggestions.

son
A subordinate process. For example, the XLPT process is a son of the EXEC process, because EXEC creates the XLPT process.

Sort/Merge
A program, supplied with AOS/VS, that allows users to edit records or reorder them in numeric or alphabetical order.

source file
The file that contains the source statments of a program. If the program is written in a compiled language, such as FORTRAN or PL/I, the source file must beecompiled before the program can be run. In BASIC, you can usually just type and run the source file. In a compiled language, the source file is the most important file (more important than the .OB and .PR versions, which can easily be recreated by the compiler and Link program).

SPU (system processing unit); *see* processor.

stand-alone program
A program that runs by itself, without an operating system. Operating systems are themselves stand-alone programs, as is stand-alone PCOPY.

stand-among program
A program designed to run with an operating system. The CLI is a stand-among program. The advantage of stand-among programs is that you can use the features of the operating system to make programming easier.

Starter program
A disk initialization and bootstrap program that comes with AOS/VS for MV/2000 DC and DS/7000-series systems. Starter prepares the hard disk for AOS/VS files and loads AOS/VS from the disk into memory. It can also indicate when you have a hard disk problem.

STR; *see* Software Trouble Report (STR).

strobe
A positive or negative value that you must specify for your parallel printer. You can do so via the Change Preset Values Menu. The default is positive strobe.

Superprocess
A privilege that allows a user to control any process on the system. This privilege is included as part of the System Manager profile.

Superuser
A privilege that allows a user to bypass file access controls and access any file on the system. This privilege is included as part of the System Manager profile.

support organization
The DGC group or person committed to supply help or support.

SWAT
The DGC high-level language debugger, which works with FORTRAN 77 and PL/I, for example.

switch
Aside from conventional meaning, a switch is a slash (/) followed by some characters that modify the execution of a CLI command or macro. For example, /L=LPT selects the printer queue as a listing file (instead of the terminal).

switched line
A normal telephone line, which makes connections via normal telephone switching stations. It is less expensive (and slower) than a dedicated telephone line.

symbol
The name that identifies some procedure, variable, array name, or location. Symbols are often created by users, but sometimes defined by the language or system.

synchronous communications board
An optional circuit board that you can buy for your MV/2000 DC or DS/7000-series system, which allows you to use synchronous communications lines.

synchronous line
A communications line that uses a synchronous protocol to transmit or receive data. Synchronous lines are frequently used in long distance communication between computer systems.

system board; *see* processor.

system console
The terminal from which you bring up AOS/VS and receive system messages. The system console must be connected to an appropriate board in the computer — either the system board (processor) or a video memory board.

System Control Program (SCP)
The lowest level operating system running on your computer. The SCP can load from media or disk, detect and log hardware errors, and run processor diagnostics. You can gain access to the SCP via the Change Preset Values Menu or the Technical Maintenance Menu. AOS/VS runs in conjunction with the SCP.

system engineer
A DGC engineer whose responsibility is primarily servicing software and secondarily, hardware.

System Management Interface (SMI) program
A menu-driven program that allows you to issue a set of AOS/VS EXEC and CLI commands via easy-to-use menus. SMI comes with AOS/VS for MV/2000 DC and DS/7000-series systems.

system manager
The person who plans and administers a computer system, deciding (among other things) who will be allowed to use the system and what privileges each user will have.

System Manager privilege
A privilege in a user's profile that allows the user to issue EXEC commands, like those on the restricted menus of the SMI program.

System Manager profile
A ready-made profile that comes with AOS/VS for MV/2000 DC and DS/7000-series systems. It includes the privileges System Manager, Superuser, and Superprocess and assigns the user 25,000 blocks of disk space.

system processing unit (SPU); *see* processor.

System User profile
A ready-made profile that comes with AOS/VS for MV/2000 DC and DS/7000-series systems. It has no privileges and assigns the user 25,000 blocks of disk space.

tape
A magnetic medium suitable for file backup and mass storage. For MV/2000 DC and DS/7000-series systems, the model 6351 tape device name is @MTJ0, and the primary model 6352 or 6341 tape device name is @MTJ10.

template
The word has two meanings. First, a CLI template character can represent part of a filename. You can specify part of a filename or pathname with one of the template characters (+, -, *, #) to access one or more files. For example, FOO+ matches all filenames that begin with the characters FOO in a specified directory.

Second, a template is a cardboard or plastic shape that fits on the keyboard and identifies the function keys. The template identifies their functions for a specific software product. Several products have their own templates; for example, CEO and SED.

terminal
An interactive device with a keyboard for input and a screen or printer for display. In this book, we also refer to terminals as consoles. The generic filename for a terminal is @CONSOLE. *See also* display terminal *and* hard-copy terminal.

terminate
To stop a program, either when it completes or while it is still running. Programs generally terminate themselves normally when they finish processing. Terminating a user's initial process logs the user off the system and also terminates any other programs he or she was running. Terminating a process can cause data to be lost; for example, if you terminate a user's SED process, the editing session will be lost.

text editor
A computer program designed specifically to help people write and edit text. A text editor is closely related to a word processor, but has fewer automatic text processing features. Both the CEO Word Processor and SED text editor are available on MV/2000 DC and DS/7000-series systems.

toggle
A switch, button, or key that performs one function when you use it the first time; then the opposite function when you use it again. A toggle often turns something on or off; for example, the power button on the MV/2000 DC and DS/7500 systems is a toggle button.
*

unit name; *see* device name.

user or **system user**
Anyone who uses a computer system in any capacity.

user directory
The directory created and maintained for an individual user. It usually becomes the working directory when you log on. Within it, you can create subordinate directories.

user directory directory (:UDD)
The system directory that contains user directories.

User ID
The CEO term for username.

user profile
A disk file with information that allows a person to gain access to a system or program. User profiles that provide access to AOS/VS contain a username, password, and other specifications; you can create them via SMI's Manage User Profiles Menu. Profiles that provide access to CEO contain a User ID (which must be the same as the corresponding AOS/VS username), and CEO privilege and other information. You can create a CEO profile from within CEO, path "Utilities," and then "Office Manager Functions" from the Main Menu.

username
The name under which a user logs on. The username is also the name of the user directory.

UTIL
The utilities directory. It contains many of the utility programs on the system. Its full pathname is :UTIL.

utility or **utility program**
A program supplied by DGC to help you use the system; for example, the CLI and Disk Formatter. Some utilities are included with the operating system; others are optional extras.

Vertical Forms Unit (VFU)
A feature present in some parallel printers, which permits the printer to handle a variety of form lengths and rapid manipulating within a form while under the control of a program. You can use the Forms Control Utility (FCU) to make VFU specifications.

video memory board (VMB)
An optional circuit board on DS/7700-series systems (standard on DS/7500 systems) that allows you to use graphics terminals on your system.

virtual console
A device entry on an AOS/VS system that allows remote AOS/VS users to log on as if they were on a local console.

Virtual Terminal Agent (VTA)
The XODIAC network Virtual Terminal Agent. It enables people to log on to a remote computer system.

VSGEN
A program supplied with AOS/VS that allows you to create and tailor AOS/VS operating systems. AOS/VS for MV/2000 DC and DS/7000-series systems comes with a pregenerated operating system so you don't have to use VSGEN.

VTA; *see* Virtual Terminal Agent (VTA).

warm start
A computer system startup in which computer power has stayed on since the operating system was shut down. It is usually faster than a cold start, since certain essential programs stay active and need not be reloaded. Note that the automatic powerup for MV/2000 DC and DS/7000-series systems is not invoked when you use a warm start.

Wastebasket (CEO)
A location where CEO places deleted documents. You can retrieve a deleted document from the Wastebasket until someone runs the CEO Janitor program; then the document is gone forever.

window
A user-definable rectangular area on the terminal screen in which a program runs, independent of any other programs running in other windows on the same screen. The DG/VIEW product allows you to use windows. (*See also* DG/VIEW.)

windowing
Using windows on a pixel-mapped terminal.

word processor
A software product that allows you to compose and edit text on a video screen.

working directory
The directory where you are currently positioned; the current directory.

X.25
The XODIAC network management support process, which runs all other network operations. Also, X.25 is the name of an international standard for intercomputer communications.

XLPT
Name of an EXEC son (or subordinate) process that manages the printers.

XODIAC
Data General Corporation's networking system, which allows systems to communicate with one another in a private or local area network. XODIAC also allows large DGC systems to participate in a Public Data Network like TELENET.

End of Glossary

Alphabetical Listing of SMI Keywords

Keyword	Menu or Function	Command or Menu	SYSMGR Only?	Optional Arguments
ADMIN	Administrative Functions	Menu	Yes	None
ALIGN	Align the printer paper	Command	No	printer name pages
ARCHIVE	Archive (back up or restore files)	Menu	No	None
BACKUP	Back up personal files	Command	No	None
BATCH	Manage batch queue	Menu	Yes	None
BCANCEL	Cancel a queued batch job	Command	Yes	seq. number
BCONTINUE	Continue batch stream	Command	Yes	stream number
BDISPLAY	Display contents of the queue	Command	Yes	None
BFLUSH	Terminate a currently running request	Command	Yes	stream number
BPAUSE	Pause batch stream	Command	Yes	stream number
BROADCAST	Send a message to all consoles	Command	No*	message
BSTATUS	Get status of batch streams	Command	Yes	None
BYE	Exit the SMI program	Command	No	None
CANCEL	Cancel requests in print queues	Command	No	seq. number(s)
CCLEAR	Clear a console	Command	Yes	consolename(s)
CDEFAULT	Change the default form	Command	Yes	form name printer name
CDISABLE	Disable consoles	Command	Yes	consolename(s)
CENABLE	Enable consoles	Command	Yes	consolename(s)
CLEAR	Clear a printer	Command	No	printer name
CLI	Enter the CLI	Command	No	None
CONFIGURE	Specify system configuration	Menu	Yes	None
CONSOLES	Manage consoles	Menu	Yes	None
CONTINUE	Continue a printer	Command	No	printer name
CPL	Change the number of characters per line	Command	Yes	no. of chars. printer name

(continues)

Alphabetical Listing of Starter Keywords

Keyword	Menu or Function	Command or Menu	Optional Arguments
BACKUP	Make a physical backup of the disk	Command	media type disk unitname
BOOTSTRAP	Logon banner	Command	None
BUILD	Build the system disk	Command	disk unitname
BYE	Exit the Starter program	Command	None
DATE	Change the system date or time	Command	date time
FIRMWARE	Load new system firmware	Command	unitname
FORMAT	Format a disk	Command	disk unitname
MAIN	Starter Main Menu	Menu	None
PROFILE	Reload the SYSMGR profile	Command	media type
RESTORE	Restore the disk from physical backup	Command	media type disk unitname
SOFTWARE	Load new system software	Command	media type
SYSDISK	Build or update system disk	Menu	None
SYSTEM	Start a different operating system	Command	pathname

Alphabetical Listing of SMI Keywords

Keyword	Menu or Function	Command or Menu	SYSMGR Only?	Optional Arguments
CREATE	Create a user profile	Command	Yes	username password sysmgr type? initial prog. initial IPC
CSTATUS	Display status of consoles	Command	Yes	console(s)
CUSTOMIZE	Customize the system	Menu	Yes	None
DATE	Change the system date or time	Command	Yes	date time
DELETE	Delete a user profile	Command	Yes	username
DISABLE	Disable consoles from logging on	Command	Yes	None
DISPLAY	Display contents of print queues	Command	No	None
DOWN	Execute the DOWN macro	Command	Yes	None
DOWNCLI	Edit the DOWN macro	Command	Yes	None
FORMS	Control printer forms	Menu	Yes	None
INSTALL	Install software	Command	Yes	media type directory
LINES	Define console lines	Command	Yes	None
LOGON	Edit the system log-on message	Command	Yes	None
LPP	Change the number of lines printed per page	Command	Yes	number lines printer name
MAIN	System Management Interface (SMI) Main Menu	Menu	No	None
MEDIUM	Specify the default backup/install medium	Command	Yes	None
MODIFY	Modify a user profile	Command	Yes	username
OPCOMMAND	Send a command to the OP CLI process	Command	Yes	command line
PAUSE	Pause a printer	Command	No	printer name
PCANCEL	Cancel queued print requests	Command	Yes	seq. no(s).
PCLOSE	Close a print queue	Command	Yes	queue name
PCREATE	Create a print queue	Command	Yes	queue name printer(s)

(continued)

Alphabetical Listing of SMI Keywords

Keyword	Menu or Function	Command or Menu	SYSMGR Only?	Optional Arguments
PDELETE	Delete a print queue	Command	Yes	queue name
PDISPLAY	Display status of queues	Command	Yes	None
PFLUSH	Terminate currently printing request	Command	Yes	printer name
POPEN	Open a print queue	Command	Yes	queue name
PPRINTERS	Define parallel printers	Command	Yes	None
PQUEUES	Manage printers and print queues	Menu	Yes	None
PRINTERS	Control printers	Menu	No	None
PROFILES	Manage user profiles	Menu	Yes	None
PROGRAM	Run a program or application	Command	No	command line
PSTART	Start a printer or print queue	Command	Yes	queue name printer name
PSTATUS	Check status of printers	Command	Yes	None
PSTOP	Stop a printer or print queue	Command	Yes	None
QPRINT	Print files	Command	No	pathname(s)**
RDEFAULT	Restore the default form	Command	Yes	printer name
RESTORE	Restore personal files	Command	No	None
SETUP	Edit the system setup macro	Command	Yes	None
SHUTDOWN	Shut down the system	Menu	Yes	None
SPACE	Display Disk Space Statistics	Command	Yes	None
SPECIAL	Use special forms	Command	Yes	form name printer name
SYSBACKUP	Back up system-wide files	Command	Yes	None
SYSDOWN	Shut down the system	Command	Yes	None
SYSRESTORE	Restore system-wide files	Command	Yes	None
SYSTEM	Set the default system name	Command	Yes	system name
TERMINATE	Terminate user processes	Command	Yes	None
UPCLI	Edit the UP macro	Command	Yes	None
WHOS	List all users logged on	Command	No*	None

(concluded)

* The BROADCAST and WHOS options are not restricted to System Managers, but they appear only on restricted menus. Regular system users can select either option by specifying its keyword from any SMI menu.

** The QPRINT keyword accepts only file pathnames as arguments, and assumes the default queue and form name.

Powerup Summary

This summary lists the steps you will follow to power up your system. It assumes the following:

- This is not your first time powering up the system.

- You do not want to interrupt the powerup sequence at any point.

- All diagnostic tests pass successfully.

If any of these cases are not true, refer to the powerup description in Chapter 2 of this manual for instructions.

Follow these steps for a normal, uninterrupted powerup:

1. Turn on the terminal you will use as your system console, and all other terminals and printers that you will use on the system.

2. Turn on your computer's power.

   - On MV/2000 DC and DS/7500-series systems, push in the green power button at the upper right corner of the computer's front surface.

   - On DS/7700-series systems, press the top portion of the power switch (marked PWR) on the upper right corner of the computer's front surface.

3. Relax or go do something else for a few minutes.

   When you return, the system should be up and the log-on banner, like the one shown below for the MV/2000 DC, will be on all terminal screens.

   **** *MV/2000 DC / Press NEW LINE to begin logging on* ****

   If any diagnostic tests have not passed, you will see the appropriate message on your screen or DS/7700-series system's digital LED display instead. Refer to Chapter 7 in these cases.

Index

Back Up System-Wide Files screen (fig.) 4-26
backing up
  and restoring files 4-1ff
  files, reasons for 4-1
  or restoring files 3-18
  personal files 4-15ff
    to diskettes 4-17f
    to tape 4-18
  system-wide files 4-22ff
backup
  defined Glossary-2
  medium, specifying default 3-33f
  physical (PCOPY) 2-25f
  sets of media 4-3f
  steps involved in system-wide 4-22
BACKUP keyword
  SMI 4-15, B-4
  Starter 2-25, B-3
backups
  full versus incremental 4-2
  logical versus physical 4-2f
  scheduling 4-3
  system-wide versus personal 4-1f
bad block, defined Glossary-2
base system board 1-3
basic components of the system 1-3
BASIC language, defined Glossary-2
batch
  and printer queues, and EXEC 3-3
  defined Glossary-2
  operations, defined 1-5
  queue
    displaying contents of 3-59
    managing 3-58ff
  requests
    canceling queued 3-60
    terminating (flushing) 3-60
  streams
    continuing 3-61
    displaying status of 3-59
    pausing 3-60f
BATCH keyword 3-58, B-4
baud, defined Glossary-2
baud rate, about 3-38
BCANCEL keyword 3-60, B-4
BCONTINUE keyword 3-61, B-4
BDISPLAY keyword 3-59, B-4
Begin/End Line function key (tbl.) 1-11
benefits and restrictions of hard-copy terminal C-5
BFLUSH keyword 3-60, B-4
bit, defined Glossary-2
blank disk, installing AOS/VS on A-1ff
block, disk 3-2f, Glossary-6
boards, printed circuit 1-8
boot, defined Glossary-3

bootstrap, defined Glossary-3
BOOTSTRAP keyword 2-24, B-3
bootstrapping, defined 2-22
BPAUSE keyword 3-60, B-4
bpi, defined Glossary-3
break files, deleting 5-13
BREAK key 1-9, 2-2; *see also* break sequence
break sequence
  and system shutdown 3-64
  defined Glossary-3
breakpoint, defined Glossary-3
bringing down
  CEO and INFOS II before backup 4-25f
  network, INFOS II, or CEO from the DOWN macro 3-45
bringing up
  AOS/VS 2-13ff
  CEO and INFOS II after the backup 4-31f
  network, INFOS II, or CEO from the UP macro 3-43f
BRK key 1-9; *see also* break sequence
BROADCAST keyword 3-28, 3-63, B-4, B-6
broadcasting a message 3-28
  before backup 4-24
BSTATUS keyword 3-59, B-4
bug, defined Glossary-2
BUILD keyword 2-27, B-3
Build or Update System Disk Menu 2-26f
building or updating the system disk 2-26ff
building the disk 2-27
bus, defined Glossary-3
Business BASIC, defined Glossary-3
by default, defined Glossary-5
BYE keyword
  SMI 1-18, 3-5, B-4
  Starter B-3
byte, defined Glossary-3

C

cables 1-2
CAD, defined Glossary-3
CAE, defined Glossary-3
CAI, defined Glossary-3
CAM, defined Glossary-3
CANCEL keyword 3-10, B-4
Cancel/Exit function, on hard-copy terminal C-2
Cancel/Exit function key (F11) (tbl.) 1-11, 3-5
  and Define a Console Line screen 3-39
  exiting from menus with 1-14
canceling a queued batch request 3-60
canceling queued print requests 3-10, 3-47
caret (^) character, and passwords 3-22
cartridge tape
  model 6351 (fig.) 4-7
  model 6352 (fig.) 4-8

069-000129

root directory, defined 1-6, Glossary-15
running
  abbreviated diagnostics 5-7f
  ADES diagnostics 5-12
  interactive system management tutorial 3-19
  program or application 3-6
  SMI 3-5
  stand-alone program 2-24

S

SAFE indicator on model 6352 cartridge tapes 4-10, 4-12
sample
  Back Up Personal Files screen (fig.) 4-16
  Back Up System-Wide Files screen (fig.) 4-27
  broadcast message (fig.) 3-28
  command screen (fig.) 1-15
  Create a User Profile screen (fig.) 3-23
  first DISCO screen (fig.) 5-15
  menu (fig.) 1-13
  Modify a User Profile screen (fig.) 3-25
  Restore System-Wide Files screen (fig.) 4-34
  session using the Control Printers Menu 3-12ff
  system shutdown dialog 3-65ff
scheduling your backups 4-3
SCP, see System Control Program (SCP)
SCP CLI
  booting disk from 7-16
  entering and exiting 5-6, 5-11
  using to power up 3-64
  see also System Control Program (SCP)
SCP-CLI> prompt 5-6, 5-11, 7-15f, 7-24
screens, command 1-14ff
scroll, defined Glossary-15
scrolling a screen in Page mode 1-9
scrolling the help display 1-20
search list, defined Glossary-16
sector; see disk block
security
  on AOS/VS 1-5
  physical 3-2
  system 3-2f
SED text editor
  editing system setup macro or log-on message with 3-45
  editing UP and DOWN macros with 3-43ff
Select Diagnostics Sequence screen (fig.) 5-8
selecting
  diagnostics sequence 5-7f
  media for system-wide backup 4-26
  menu options 1-13f
sending
  command to the master CLI process 3-62
  message to all consoles 3-28
    before backup 4-24

sequence number, defined 3-7
serial printer, defined Glossary-16
setting the system date and time 2-17ff
SETUP keyword 3-45, B-6
setup macro, editing 3-45
seven-segment digital LED display 2-9ff
SHIFT-F1 key; see Help function key
Shut Down the System Menu (fig.) 3-63
shutdown
  abnormal system 7-23ff
  dialog, sample 3-65ff
  forcing 7-24
SHUTDOWN keyword 3-62, B-6
shutting down
  CEO, INFOS II, and the network while running SMI 3-62
  the system 3-62ff
    without powering down 3-64
SMI
  about 3-3f
  and EXEC commands 3-3f
  and system management tasks 3-1
  archive menus 4-14ff
  defined Glossary-18
  entering from CEO 3-5
  error messages 7-2ff
  keyword summary B-4ff
  Main Menu (fig.) 3-4
    as displayed on a hard-copy terminal (fig.) C-3
SMI.CLI macro 3-5
SMI_CLI) prompt 1-18, 3-6
SOFT ERROR 4-5
software
  defined Glossary-16
  formatting a disk 2-27f
  installing 3-41f
  levels of 1-5
  system, loading on disk 2-28
SOFTWARE keyword 2-28, B-3
Software Subscription Service (SSS), defined Glossary-16
Software Trouble Report (STR) 7-24f, 7-27, Glossary-16
son, defined Glossary-16
Sort/Merge, defined Glossary-16
source file, defined Glossary-16
space
  checking how much is being used 5-14
  disk 5-13ff
SPACE
  CLI command 5-14
  SMI keyword 5-14, B-6
special form, switching to 3-54ff
special keys 1-9
SPECIAL keyword 3-54, B-6

timesharing system, defined 1-5
toggle, defined Glossary-19
turning on the power on DS/7700-series systems (fig.)
    2-9
turning power on and off on MV/2000 DC and
    DS/7500-series systems (fig.) 2-4
tutorial
    and hard-copy terminals C-5
    on-line interactive system management 1-5, 1-20,
        3-72
    running 3-19
two-disk systems 2-29f
types of media available for file backup 4-3f

U

:UDD (user directory directory) 1-6
unit name; see device name
UNLOAD button, model 6352 tape drives 4-12f
UP macro 6-2
    editing 3-43f
    editing to initialize second disk 2-30
:UP.LOG file 3-44
UP.NETWORK.CLI macro 3-43, 6-2
uparrow 1-15, 2-19
UPCLI keyword 3-43f, B-6
updating the time on the screen 2-25
upgrading system software 2-28
uppercase
    and filenames 1-6
    and keywords 1-17
useful function keys (tbl. and fig.) 1-11
user
    defined Glossary-19
    directories, obsolete 5-13
    directory
        defined Glossary-19
        deleting 3-25f
    files, reloading from backup after rebuilding disk
        A-8
    interface, defined Glossary-10
    process, terminating 3-28f
    profile, defined Glossary-19
    profiles
        about 1-5, 3-2f
        creating 3-21ff
        deleting 3-25f
        managing 3-21ff
        modifying 3-24f
    type, specifying when creating a profile 3-22
user directory directory (:UDD), defined Glossary-19
User ID, defined Glossary-19
username
    and password prompts (fig.) 2-20

characters allowed 3-22
    defined Glossary-19
    prompt (fig.) 2-20
users
    dealing with during backup 4-24f
    listing all logged on 3-27f
    non-system management 1-18
    number on system 1-4
    of this manual iii
    system management 1-18f
    types of 1-18f
using
    command screens 1-14ff
    diskettes 4-4ff
    hard-copy system console C-1ff
    keywords 1-16ff
    PCOPY 2-25f
    system menus and command screens 1-12ff
    tapes 4-7ff
:UTIL (system utilities directory) 1-6, Glossary-19
utility, defined Glossary-19
utility program, defined Glossary-19

V

verifying and loading microcode 5-11
verifying material backed up on a model 6351 tape
    drive 4-9
Vertical Forms Unit (VFU) 5-8f, Glossary-19
video memory board (VMB)
    and the system console 2-11
    defined Glossary-20
    putting system console on 5-6f
    test message (fig.) 2-12
virtual console, defined Glossary-20
Virtual Terminal Agent (VTA) 6-1, Glossary-20
VSGEN utility 3-43, Glossary-20
VTA 6-1, Glossary-20

W

warm start, defined Glossary-20
Wastebasket (CEO), defined Glossary-20
what if something goes wrong? 7-1ff
WHOS keyword 3-27, 3-63, B-6
Winchester disk; see disk
window
    clearing a hung process in (example) 3-30
    defined Glossary-20
windowing
    defined Glossary-20
    documentation v
windows, and Manage Consoles Menu options 3-26f
word processor, defined Glossary-20
working directory 1-6
    defined Glossary-20
    executing SMI from 3-5

069-000129

▲ DataGeneral

TP_____

TIPS ORDER FORM
Technical Information & Publications Service

BILL TO:

COMPANY NAME_____

ADDRESS _____

CITY _____

STATE_____ ZIP _____

ATTN: _____

SHIP TO: (if different)

COMPANY NAME_____

ADDRESS _____

CITY _____

STATE_____ ZIP _____

ATTN: _____

QTY	MODEL #	DESCRIPTION	UNIT PRICE	LINE DISC	TOTAL PRICE

(Additional items can be included on second order form)

[Minimum order is $50.00]

Tax Exempt #_____
or Sales Tax (if applicable)

TOTAL	
Sales Tax	
Shipping	
TOTAL	

── METHOD OF PAYMENT ──

☐ Check or money order enclosed
For orders less than $100.00

☐ Charge my   ☐ Visa   ☐ MasterCard
Acc't No._____ Expiration Date_____

☐ Purchase Order Number:_____

── SHIP VIA ──

☐ DGC will select best way (U.P.S or Postal)

☐ Other:
   ☐ U.P.S. Blue Label
   ☐ Air Freight
   ☐ Other _____
   _____

── NOTE: ORDERS LESS THAN $100, INCLUDE $5.00 FOR SHIPPING AND HANDLING. ──

Person to contact about this order _____ Phone _____ Extension _____

Data General Corporation
Educational Services/TIPS
MS G214
2400 Computer Drive
Westboro, MA 01580
(617) 366-8911, Extension 1610

Buyer's Authorized Signature _____ Date _____
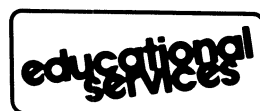(agrees to terms & conditions on reverse side)

Title _____

DGC Sales Representative (If Known) _____ Badge # _____

**DISCOUNTS APPLY TO
MAIL ORDERS ONLY**

012-1780

educational services

DATA GENERAL CORPORATION
TECHNICAL INFORMATION AND PUBLICATIONS SERVICE
TERMS AND CONDITIONS

Data General Corporation ("DGC") provides its Technical Information and Publications Service (TIPS) solely in accordance with the following terms and conditions and more specifically to the Customer signing the Educational Services TIPS Order Form shown on the reverse hereof which is accepted by DGC.

1. PRICES
Prices for DGC publications will be as stated in the Educational Services Literature Catalog in effect at the time DGC accepts Buyer's order or as specified on an authorized DGC quotation in force at the time of receipt by DGC of the Order Form shown on the reverse hereof. Prices are exclusive of all excise, sales, use or similar taxes and, therefore are subject to an increase equal in amount to any tax DGC may be required to collect or pay on the sale, license or delivery of the materials provided hereunder.

2. PAYMENT
Terms are net cash on or prior to delivery except where satisfactory open account credit is established, in which case terms are net thirty (30) days from date of invoice.

3. SHIPMENT
Shipment will be made F.O.B. Point of Origin. DGC normally ships either by UPS or U.S. Mail or other appropriate method depending upon weight, unless Customer designates a specific method and/or carrier on the Order Form. In any case, DGC assumes no liability with regard to loss, damage or delay during shipment.

4. TERM
Upon execution by Buyer and acceptance by DGC, this agreement shall continue to remain in effect until terminated by either party upon thirty (30) days prior written notice. It is the intent of the parties to leave this Agreement in effect so that all subsequent orders for DGC publications will be governed by the terms and conditions of this Agreement.

5. CUSTOMER CERTIFICATION
Customer hereby certifies that it is the owner or lessee of the DGC equipment and/or licensee/sub-licensee of the software which is the subject matter of the publication(s) ordered hereunder.

6. DATA AND PROPRIETARY RIGHTS
Portions of the publications and materials supplied under this Agreement are proprietary and will be so marked. Customer shall abide by such markings. DGC retains for itself exclusively all proprietary rights (including manufacturing rights) in and to all designs, engineering details and other data pertaining to the products described in such publication. Licensed software materials are provided pursuant to the terms and conditions of the Program License Agreement (PLA) between the Customer and DGC and such PLA is made a part of and incorporated into this Agreement by reference. A copyright notice on any data by itself does not constitute or evidence a publication or public disclosure.

7. DISCLAIMER OF WARRANTY
DGC MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANT-ABILITY AND FITNESS FOR PARTICULAR PURPOSE ON ANY OF THE PUBLICATIONS SUPPLIED HEREUNDER.

8. LIMITATIONS OF LIABILITY
IN NO EVENT SHALL DGC BE LIABLE FOR (I) ANY COSTS, DAMAGES OR EXPENSES ARISING OUT OF OR IN CONNEC-TION WITH ANY CLAIM BY ANY PERSON THAT USE OF THE PUBLICATION OF INFORMATION CONTAINED THEREIN INFRINGES ANY COPYRIGHT OR TRADE SECRET RIGHT OR (II) ANY INCIDENTIAL, SPECIAL, DIRECT OR CONSEQUEN-TIAL DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOSS OF DATA, PROGRAMS OR LOST PROFITS.

9. GENERAL
A valid contract binding upon DGC will come into being only at the time of DGC's acceptance of the referenced Educational Services Order Form. Such contract is governed by the laws of the Commonwealth of Massachusetts. Such contract is not assignable. These terms and con-ditions constitute the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior oral or written communications, agreements and understandings. These terms and conditions shall prevail notwithstanding any different, conflicting or addi-tional terms and conditions which may appear on any order submitted by Customer.

DISCOUNT SCHEDULES

DISCOUNTS APPLY TO MAIL ORDERS ONLY.

LINE ITEM DISCOUNT

5-14 manuals of the same part number - 20%
15 or more manuals of the same part number - 30%

DISCOUNTS APPLY TO PRICES SHOWN IN THE CURRENT TIPS CATALOG ONLY.

◖⊿DataGeneral

TIPS ORDERING PROCEDURE:

Technical literature may be ordered through the Customer Education Service's Technical Information and Publications Service (TIPS).

1. Turn to the TIPS Order Form.

2. Fill in the requested information. If you need more space to list the items you are ordering, use an additional form. Transfer the subtotal from any additional sheet to the space marked "subtotal" on the form.

3. Do not forget to include your MAIL ORDER ONLY discount. (See discount schedules on the back of the TIPS Order Form.)

4. Total your order. (MINIMUM ORDER/CHARGE after discounts of $50.00.)

    If your order totals less than 100.00, enclose a certified check or money order for the total (include sales tax, or your tax exempt number, if applicable) plus $5.00 for shipping and handling.

5. Please indicate on the Order Form if you have any special shipping requirements. Unless specified, orders are normally shipped U.P.S.

6. Read carefully the terms and conditions of the TIPS program on the reverse side of the Order Form.

7. Sign on the line provided on the form and enclose with payment. Mail to:

    Data General Corporation
    Educational Services/TIPS
    MS G214
    2400 Computer Drive
    Westboro, MA 01580
    (617) 366-8911, Extension 1610

8. We'll take care of the rest!

educational services

moisten & seal

CUSTOMER DOCUMENTATION COMMENT FORM

Your Name _____ Your Title _____

Company _____

Street _____

City _____ State _____ Zip _____

We wrote this book for you, and we made certain assumptions about who you are and how you would use it. Your comments will help us correct our assumptions and improve the manual. Please take a few minutes to respond. Thank you.

Manual Title _____ Manual No. _____

Who are you?
- ☐ EDP/MIS Manager
- ☐ Senior Systems Analyst
- ☐ Engineer
- ☐ Analyst/Programmer
- ☐ Operator
- ☐ End User
- ☐ Other _____
- _____

How do you use this manual? *(List in order: 1 = Primary Use)*

___ Introduction to the product
___ Reference
___ Tutorial Text
___ Operating Guide
___ Other
_____

About the manual:		Yes	No
	Is it easy to read?	☐	☐
	Is it easy to understand?	☐	☐
	Are the topics logically organized?	☐	☐
	Is the technical information accurate?	☐	☐
	Can you easily find what you want?	☐	☐
	Does it tell you everything you need to know?	☐	☐
	Do the illustrations help you?	☐	☐

If you wish to order manuals, use the enclosed TIPS Order Form (USA only).

Comments:

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS   PERMIT NO. 26   SOUTHBORO, MA 01772

Postage will be paid by addressee

꜀ › DataGeneral

Customer Documentation
MS E-219
4400 Computer Drive
Westboro, MA 01581 - 9973

134-755-01

moisten & seal

CUSTOMER DOCUMENTATION COMMENT FORM

Your Name _____ Your Title _____

Company _____

Street _____

City _____ State _____ Zip _____

We wrote this book for you, and we made certain assumptions about who you are and how you would use it. Your comments will help us correct our assumptions and improve the manual. Please take a few minutes to respond. Thank you.

Manual Title _____ Manual No. _____

Who are you?   ☐ EDP/MIS Manager   ☐ Analyst/Programmer   ☐ Other _____
               ☐ Senior Systems Analyst ☐ Operator   _____
               ☐ Engineer   ☐ End User

How do you use this manual? *(List in order: 1 = Primary Use)*

____ Introduction to the product   ____ Tutorial Text   ____ Other
____ Reference   ____ Operating Guide   _____

fold

About the manual:		Yes	No
	Is it easy to read?	☐	☐
	Is it easy to understand?	☐	☐
	Are the topics logically organized?	☐	☐
	Is the technical information accurate?	☐	☐
	Can you easily find what you want?	☐	☐
	Does it tell you everything you need to know?	☐	☐
	Do the illustrations help you?	☐	☐

If you wish to order manuals, use the enclosed TIPS Order Form (USA only).

Comments:

BUSINESS REPLY MAIL

FIRST CLASS   PERMIT NO. 26   SOUTHBORO, MA 01772

Postage will be paid by addressee

◆▶ DataGeneral

Customer Documentation
MS E-219
4400 Computer Drive
Westboro, MA 01581-9973

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES