

*Operating the
Domain
Personal
Workstations
and Servers*

007858-A00

apollo



Operating the Domain Personal Workstations and Servers

Order No. 007858-A00

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The Federal Communications Commission (FCC) of the U.S. government regulates the radio frequency energy emanated by computing devices through published regulations. These regulations specify the limits of radio frequency emission to protect radio and television reception. All Domain nodes and peripherals have been tested and comply with these limits. The FCC regulations also require that computing devices used in the U.S. display the agency's label and that the related documentation include the following statement.

WARNING: This equipment generates, uses, and may emit radio frequency energy and, if not installed and used in accordance with these instructions, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Warnings and Cautions

- CAUTION:** System damage will occur if the voltage selection switches are set incorrectly. See pages 2-15, 2-21.
- VORSICHT:** Systemschaden ist unvermeidlich, falls die Volt-Wahlschalter falsch eingestellt sind. Siehe Selten 2-15, 2-21.
- ATTENTION:** Le système sera endommagé si les sélecteurs de tension sont mal positionnés. Cf. pages 2-15, 2-21.
- CAUTION:** Monitor screen damage will occur if the monitor is left on for extended periods of time with the same image on the screen at high intensity.
- VORSICHT:** Bildschirmschaden ist unvermeidlich, falls der Bildschirm über längere Zeit und mit demselben Bild auf dem Schirm bei hoher Intensität angeschaltet bleibt.
- ATTENTION:** L'écran du moniteur sera endommagé si le moniteur est laissé pendant une période prolongée avec la même image sur l'écran à haute intensité.
- CAUTION:** System power cord must be plugged into an accessible dedicated ac mains receptacle.
- VORSICHT:** Das System-Netzanschlußkabel muß an eine zugängliche spezielle Wechselstrom-Hauptzuführungssteckdose angeschlossen werden.
- ATTENTION:** Le fil d'alimentation électrique du système doit être branché dans une prise de courant c.a. spécialisée accessible.

Preface

Operating the Domain Personal Workstations and Servers explains how to operate the Domain® Personal Workstations™ and Servers. For best results, read this guide completely before using your system, and then keep it handy for reference.

We've organized this guide as follows:

- | | |
|-------------------|---|
| Chapter 1 | Describes the Domain Personal Workstations and Servers features and options. |
| Chapter 2 | Describes how to operate Domain Personal Workstations and how to interpret LED codes. |
| Chapter 3 | Describes how to operate servers. |
| Chapter 4 | Describes how to use a diskette drive. |
| Chapter 5 | Describes how to use a cartridge tape drive. |
| Chapter 6 | Describes how to recognize and recover from system failures. |
| Chapter 7 | Provides simple preventive maintenance procedures. |
| Appendix A | Provides the Apollo® Customer Services number, and lists information that you should have ready when calling. |

Appendix B	Shows you where the Domain system serial numbers are located, and provides a place to record them.
Appendix C	Describes how to run the calendar program.

Related Manuals

The file `/install/doc/apollo/os.v.latest software release number__manuals` lists current titles and revisions for all available manuals. For example, at this release refer to `/install/doc/apollo/os.v.10.1__manuals` to check that you are using the correct version of manuals. You may also want to use this file to check that you have ordered all of the manuals that you need. (If you are using the Aegis environment, you can access the same information through the Help system by typing `help manuals`.)

Refer to the *Domain Documentation Quick Reference* (002685) and the *Domain Documentation Master Index* (011242) for a complete list of related documents. For more information on the *Domain Systems*, refer to the following documents:

- *Aegis Command Reference* (002547), *BSD Command Reference* (005800), and *SysV Command Reference* (005798)
- *Domain Hardware Site Planning Specifications* (009859)
- *Managing SysV System Software* (010851), *Managing Aegis System Software* (010852), and *Managing BSD System Software* (010853)
- *Unpacking and Installing Your Domain Personal Workstations and Servers* (007857)
- *Using Your BSD Environment* (011020), *Using Your Aegis Environment* (011021), *Using Your SysV Environment* (011022)

You can now order Apollo documentation by calling 1-800-225-5290

Naming Conventions

This manual supports the Domain Series 3000™, Series 3500™, Series 4000™, and Series 4500™. Where manual contents apply to all models, the words *Domain System* appear. Where contents apply to a specific model, the appropriate model name appears; for example, Domain Series 4500 (DS4500).

Problems, Questions, and Suggestions

We appreciate comments from the people who use our system. To make it easy for you to communicate with us, we provide the Apollo Product Reporting (APR) system for comments related to hardware, software, and documentation. By using this formal channel, you make it easy for us to respond to your comments.

You can get more information about how to submit an APR by consulting the appropriate Command Reference manual for your environment (Aegis™, BSD, or SysV). Refer to the **mkapr** (make apollo product report) shell command description. You can view the same description online by typing:

\$ man mkapr (in the SysV environment)

% man mkapr (in the BSD environment)

\$ help mkapr (in the Aegis environment)

Alternatively, you may use the Reader's Response Form at the back of this manual to submit comments about the manual.

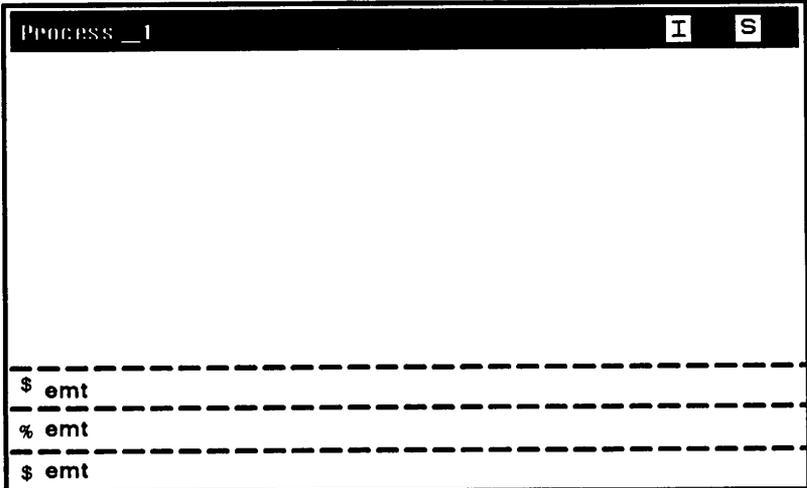
Documentation Conventions

Unless otherwise noted in the text, this manual uses the following symbolic conventions.

literal values	Bold words or characters in formats and command descriptions represent commands or keywords that you must use literally. Pathnames are also in bold. Bold words in text indicate the first use of a new term.
<i>user-supplied values</i>	Italic words or characters in formats and command descriptions represent values that you must supply.
sample user input	In examples, information that the user enters appears in color.
output	Information that the system displays appears in this typeface.
[]	Square brackets enclose optional items in formats and command descriptions.
{ }	Braces enclose a list from which you must choose an item in formats and command descriptions.
	A vertical bar separates items in a list of choices.
< >	Angle brackets enclose the name of a key on the keyboard.
CTRL/	The notation CTRL/ followed by the name of a key indicates a control character sequence. Hold down <CTRL> while you press the key.
. . . .	Vertical ellipsis points mean that irrelevant parts of a figure or example have been omitted.

Operating Environments

After your system is installed, the system administrator can change the default operating system environment to any of three versions: SysV, BSD, or Aegis. To assist you in entering commands illustrated in the text, we provide a visual display of all three operating environments. The screen displays in the text are similar to the following example:



```
Process _1  I  S
-----
SysV $ emt
-----
BSD  % emt
-----
Aegis $ emt
```



Contents

Chapter 1 Overview

Chapter 2 Using the Personal Workstation

Positioning the Monitor	2-2
Using the Monitor Controls	2-3
Degaussing the Color Monitors	2-8
Using the System Unit Controls	2-9
Understanding the LEDs	2-11
LEDs During Normal Operation	2-12
LED Error Codes	2-13
Starting Up	2-14
Starting Up in Normal Mode	2-15
Starting Up in Service Mode	2-21
Shutting Down	2-28

Chapter 3 Using the Server

Starting Up	3-2
Connecting a Terminal or Domain Node	3-3
Starting Up in Normal Mode	3-6
Starting Up in Service Mode	3-10
Logging In and Logging Out	3-15
Executing Programs	3-22
Using Shell Commands	3-22
Running Programs	3-22
Editing and Reading Files	3-22
Creating Server Processes	3-23
Shutting Down	3-24

Chapter 4 Using the Diskette Drive

Handling Diskettes	4-2
Inserting, Initializing, and Mounting Diskettes	4-3
Dismounting and Removing Diskettes	4-10

Chapter 5 Using the Cartridge Tape Drive

Inserting and Removing a Tape	5-3
Write Protecting a Tape	5-4
Retensioning a Tape	5-5
Writing and Restoring Directories, Files, and Links	5-6
Writing to a Domain Cartridge Tape	5-8
Restoring Objects to a Disk	5-10
Performing a Winchester Backup	5-12
Running Standalone Utilities from a Cartridge Tape	5-15
Booting the Operating System from a Cartridge Tape	5-16

Chapter 6 Recovering from a System Crash

Handling a System Hang	6-2
Handling a System Crash	6-8
Dumping Memory	6-13
Dumping Memory to a Diskette or Cartridge Tape ...	6-13
Dumping Memory Across the Network	6-20

Chapter 7 Maintaining the System

Appendix A Calling for Service

Appendix B Recording Serial Numbers

Appendix C Setting the System Calendar



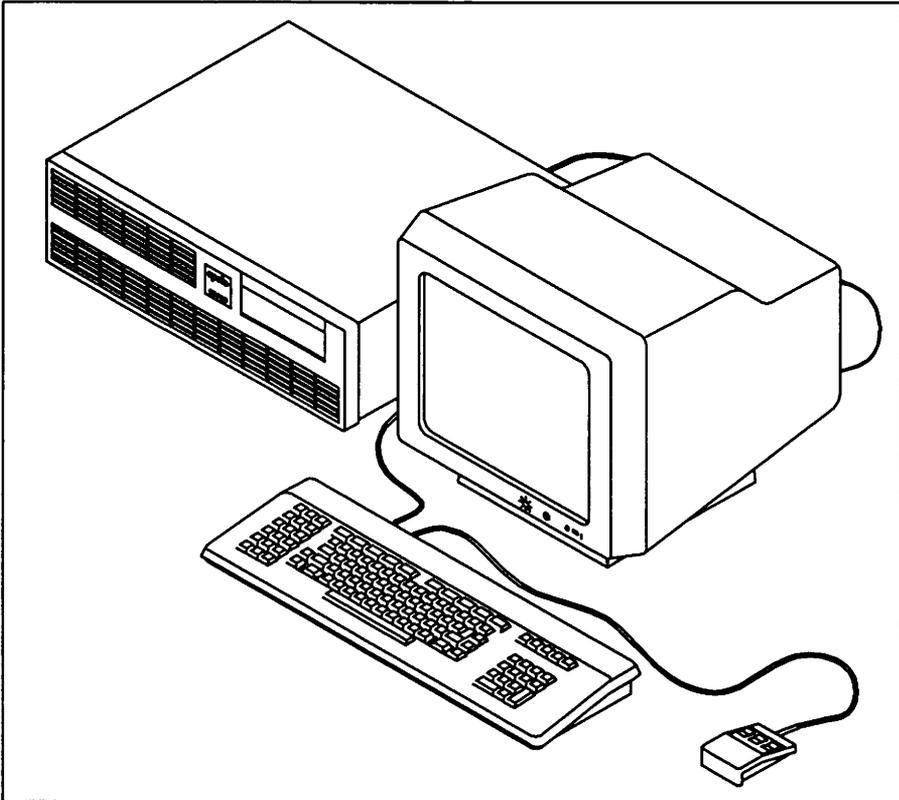


Chapter 1

Overview

Your Personal Workstation is designed for technical professionals in fields such as software engineering, hardware engineering, and technical publishing. The system combines powerful computational performance and graphics capabilities with cost-effective pricing and compact design. The versatile Personal Workstation is available in several models: the DS3000, DS3500, DS4000, and DS4500. They can function as workstations (the DN series) or as servers (the DSP series). For configuration versatility, you can mount the system unit in the optional floor stand or place the entire system on your desktop.

The server consists of the system unit only. The workstation is made up of three subsystems: the system unit, a monitor, and a keyboard. The following illustration shows a typical workstation configuration.



The system unit houses the processor module, option boards, and mass storage devices. The workstation can be configured with a 15-inch color monitor, 15-inch monochrome monitor, 19-inch color monitor, or a 19-inch monochrome monitor. The 19-inch color monitors feature either 1280 x 1024 resolution or 1024 x 800 resolution. The 15-inch color monitor features 1024 x 800 resolution. The 19-inch monochrome monitor features 1280 x 1024 resolution, and the 15-inch monochrome monitor features 1024 x 800 resolution. Besides the main keyboard array, the keyboard has a numeric keypad, 10 user-definable function keys, and a mouse.

The following table lists the DS3000 features and options.

Component	Features
System Unit	MC68020-based, 32-bit architecture MC68881 Floating-Point Coprocessor Network-wide virtual memory 2-MB memory boards 8-MB maximum main memory 6-MHz AT ¹ Bus Aegis, SysV, BSD operating environments 7 expansion slots for PC AT compatible boards 1 expansion slot for XT ² compatible boards 72-, 155-, 348-MB Winchester disk drives (formatted capacities) 1.2-MB, 5 1/4-inch optional diskette drive 45- or 60-MB cartridge tape drive ETHERNET ³ interface Serial/Parallel Expansion (SPE) interface
15-Inch Color Monitor	1024 x 800 resolution, tilt-swivel features
15-Inch Monochrome Monitor	1024 x 800 resolution, tilt-swivel features
19-Inch, 1280 x 1024 Color Monitor	1280 x 1024 resolution, tilt-swivel features
19-Inch Color Monitor	1024 x 800 resolution, tilt-swivel features
19-Inch Monochrome Monitor	1280 x 1024 resolution, tilt-swivel features
Keyboard	Low-profile, detachable caps lock, status light, mouse
¹ Personal Computer AT and AT are registered trademarks of International Business Machines Corporation. ² XT is a trademark of International Business Machines Corporation. ³ ETHERNET is a registered trademark of Xerox Corporation.	

As in the DS3000, the DS4000 can be configured with a 15-inch color monitor, a 15-inch monochrome monitor, a 19-inch color monitor, or a 19-inch monochrome monitor. The following table lists the DS4000 differences.

Component	Features
System Unit	25-MHz MC68020 CPU 25-MHz MC68881 Floating-Point Coprocessor MC68851 Paged Memory Management Unit (PMMU) 8-MHz AT Bus 4- and 8-MB memory boards 32-MB maximum main memory High-speed disk controller Single-board Apollo Token Ring network interface Standard 4-line SIO support (one reserved for keyboard) Proprietary peripheral controller for enhanced PC AT compatibility 155- or 348-MB Winchester disk drives (formatted capacities)

The following table lists the DS3500 features and options.

Component	Features
System Unit	MC68030-based, 32-bit architecture 25-MHz clock speed MC68882 Floating-Point Coprocessor Network-wide virtual memory 4- and 8-MB memory boards 32-MB maximum main memory Aegis, SysV, BSD operating environments 6 expansion slots for PC AT compatible boards 1 expansion slot for XT compatible boards 155-, 348-, and 697-MB Winchester disk drives (formatted capacities) 1.2-MB, 5 1/4-inch optional diskette drive 45- or 60-MB cartridge tape drive ETHERNET interface Serial/Parallel Expansion (SPE) interface
15-Inch Color Monitor	1024 x 800 resolution, tilt-swivel features (Series 3500 only)
15-Inch Monochrome Monitor	1024 x 800 resolution, tilt-swivel features (Series 3500 only)
19-Inch, 1280 x 1024 Color Monitor	1280 x 1024 resolution, tilt-swivel features
19-Inch Color Monitor	1024 x 800 resolution, tilt-swivel features
19-Inch Monochrome Monitor	1280 x 1024 resolution, tilt-swivel features
Keyboard	Low-profile, detachable caps lock, status light, mouse

The following table lists the DS4500 features and options.

Component	Features
System Unit	MC68030-based, 32-bit architecture 33-MHz clock speed MC68882 Floating-Point Coprocessor Network-wide virtual memory Interleaved main memory 4- and 8-MB paired memory boards 32-MB maximum main memory Aegis, SysV, BSD operating environments 6 expansion slots for PC AT compatible boards 1 expansion slot for XT compatible boards 155-, 348-, and 697-MB Winchester disk drives (formatted capacities) 1.2-MB, 5 1/4-inch optional diskette drive 45- or 60-MB cartridge tape drive ETHERNET interface Serial/Parallel Expansion (SPE) interface
19-Inch Color Monitor	1024 x 800 resolution, tilt-swivel features
19-Inch 1280 x 1024 Color Monitor	1280 x 1024 resolution, tilt-swivel features
19-Inch Monochrome Monitor	1280 x 1024 resolution, tilt-swivel features
Keyboard	Low-profile, detachable caps lock, status light, mouse



Chapter 2

Using the Personal Workstation

This chapter tells you how to use your Personal Workstation by describing the following:

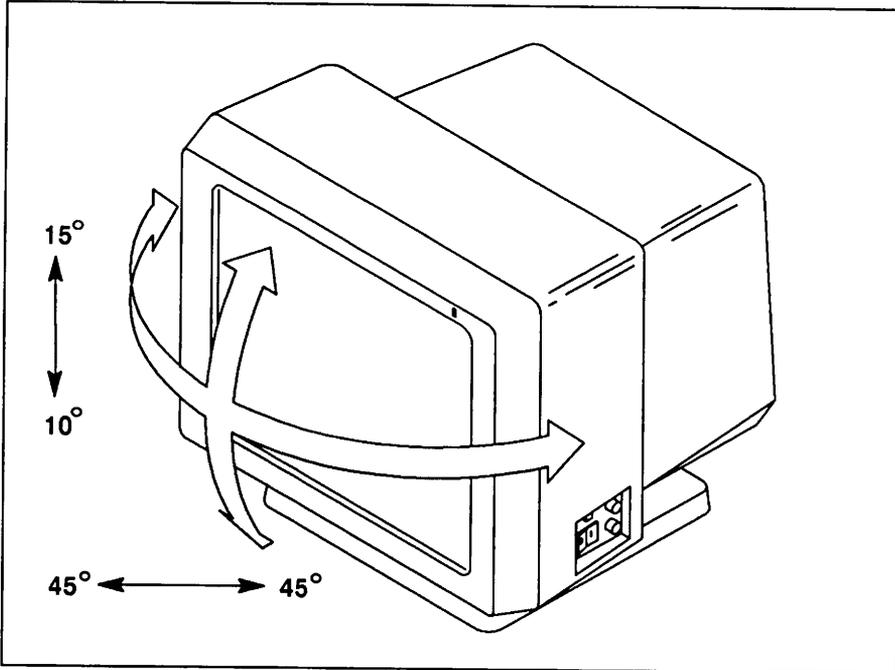
- Positioning the monitor
- Using the monitor controls
- Degaussing the color monitors
- Using the system unit controls
- Understanding the LEDs
- Starting up
- Shutting down

NOTICE: To obtain optimum performance from the monitor, please observe the following:

1. Do not place the monitor near equipment that contains strong magnets.
2. Do not place the monitor near alternating current (ac) devices, such as distribution transformers or high current ac bus bars.
3. Degauss the monitor by pressing the degauss button (refer to the section, "Degaussing the Color Monitors").

Positioning the Monitor

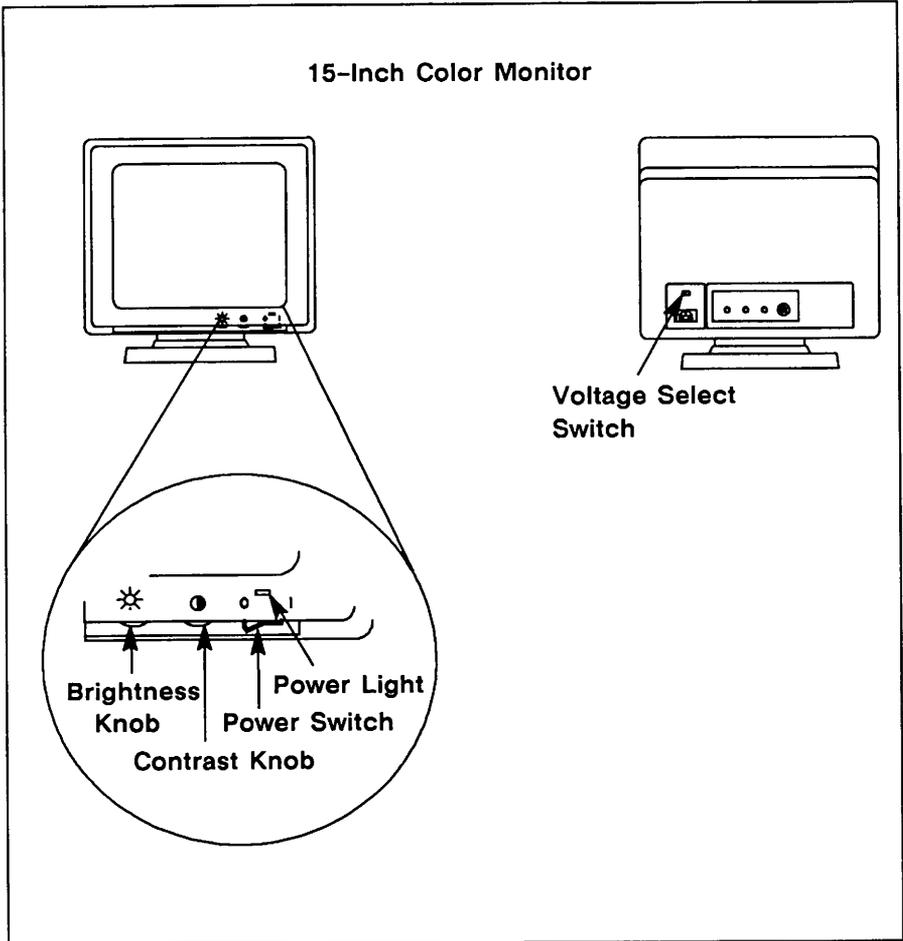
All Personal Workstation monitors have the tilt-swivel capability shown in the following illustration. This feature allows you to position the monitor for maximum comfort and efficiency.



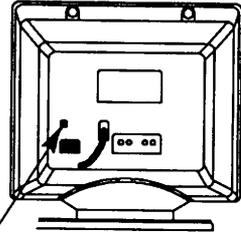
NOTICE: Refer to the *Domain Hardware Site Planning Specifications* for monitor ventilation requirements. (Refer to the Preface of this manual for a complete list of related manuals and order numbers.)

Using the Monitor Controls

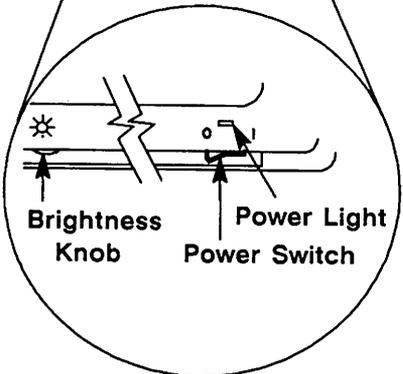
Before using your monitor, you should become familiar with the following controls.



15-Inch Monochrome Monitor



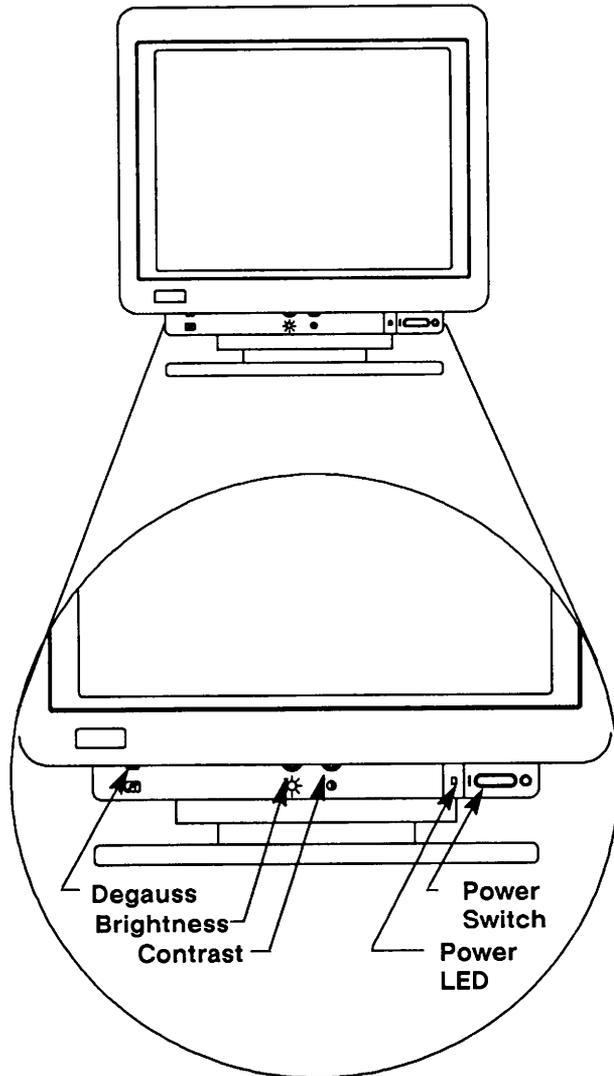
Voltage Select Switch



Brightness Knob

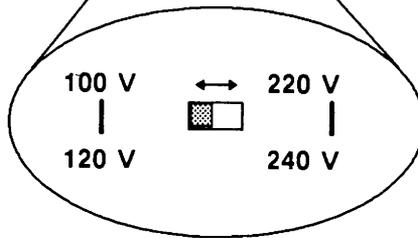
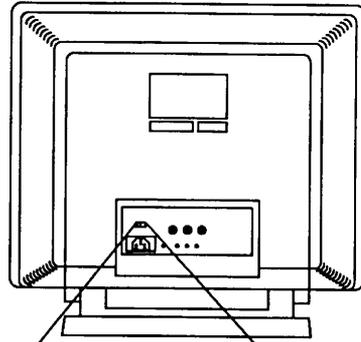
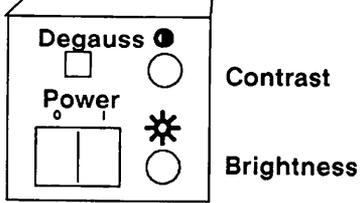
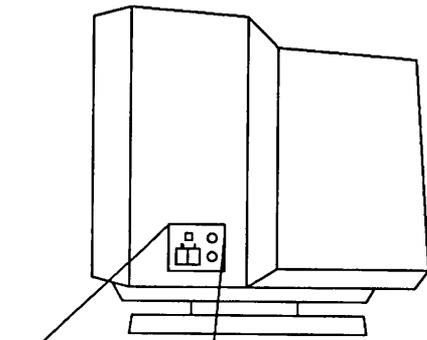
Power Light Power Switch

19-Inch, 1280 x 1024 Color Monitor



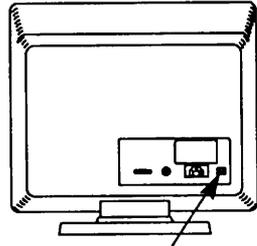
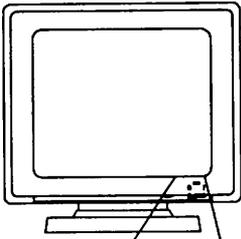
Notice: The 19-inch, 1280 x 1024 color monitor does not have an input voltage selection switch. Input voltage is 90 V ac to 240 V ac.

19-Inch Color Monitor

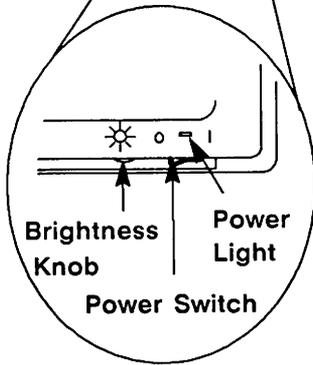


Voltage Select Switch

19-Inch Monochrome



Voltage Select
Switch



Brightness
Knob

Power
Light

Power Switch

The following table lists the monitor controls and describes their functions.

Control	Function
Brightness knob	Rotate to adjust the screen brightness.
Power switch	Press to turn the monitor on and off.
Power light (Green LED)	Lights when the monitor is on.
Voltage Select Switch	Set to correct voltage for your location (U.S. and Canada = 120 V ac) before using your system. (The 19-inch, 1280 x 1024 color monitor does not have a voltage select switch.)
Contrast knob (Color Monitor)	Rotate to adjust the screen contrast.
Degauss button (19-Inch Color Monitors Only)	Press to eliminate flux lines.

Degaussing the Color Monitors

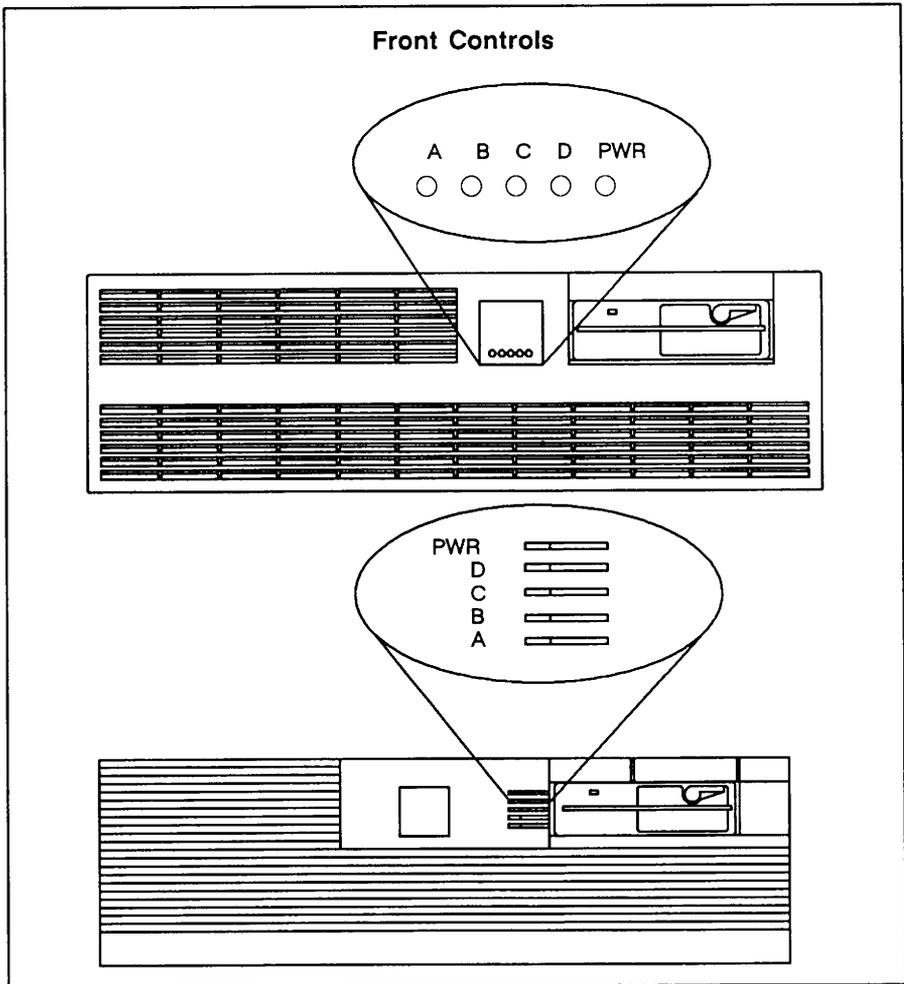
The 19-inch and 15-inch color monitors may require periodic degaussing to maintain color purity and screen clarity. You should degauss the monitors whenever you reposition them to eliminate flux lines that may result. The procedure is as follows.

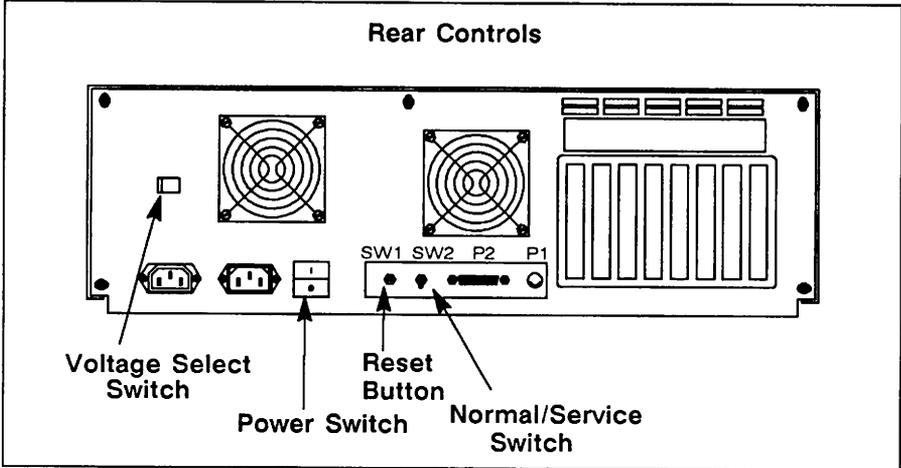
19-Inch Color Monitors: Press and hold degauss button for approximately 5 seconds.

15-Inch Color Monitor: Power off the monitor for approximately 15 seconds. The degauss circuitry in the 15-inch monitor is activated at power-off.

Using the System Unit Controls

Before turning on your Personal Workstation, you should become familiar with the system unit controls. Some are located on the front of the system unit, others are on the back.



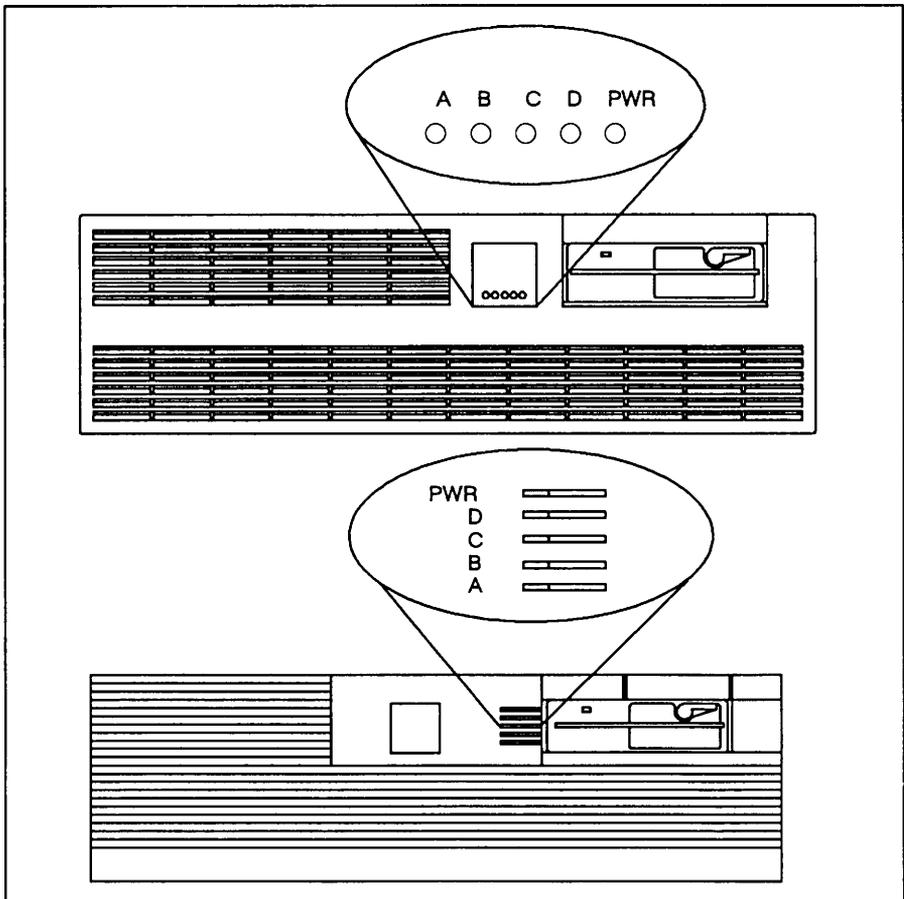


The following table describes the functions of the system unit controls.

Control	Function
LEDs A, B, C, and D (Amber)	Light in certain patterns to show: <ul style="list-style-type: none"> • Error codes • Network communications • Disk activity • Operating system activity
Power LED (Green)	Lights when the system unit is on.
Voltage Select Switch	Set to correct voltage for your location. (U.S. and Canada = 120 V ac)
Power Switch	Turns the system unit power on and off. (1 = ON, 0 = OFF)
Reset Button	Resets the system.
Normal/Service Switch	Places the system in Normal or Service mode. Make sure your system is set to Normal (up position) for regular operating activities. Use the Service setting only if your service representative requests it.

Understanding the LEDs

Five LEDs are located on the front of the system unit. The four amber LEDs, labeled A, B, C, and D, show that the Personal Workstation is running the operating system and communicating over the network. They also help troubleshoot by lighting in certain patterns during system failures. The green Power LED, labeled PWR, lights when the system unit power is on. The following subsections explain how these LEDs function during normal operation and system failures.



LEDs During Normal Operation

The following table shows how the LEDs report on normal system activity. Note that the green Power LED remains on while the Personal Workstation is powered on.

Flashing LED A B C D	Power LED PWR	Hex Code	Message
○○○○	○	01	Operating System Running
○○○○	○	02	Disk Access In Progress
○○○○	○	04	Network Receive In Progress
○○○○	○	08	Network Transmit In Progress

LED Error Codes

If a problem occurs during startup or other normal system activities, the LEDs display the failing part in binary code. Before calling for service, note the LED display so you can report it to your service representative.

LED Display A B C D	Power LED PWR	Hex Code	Failing Part
0000	○	00	CPU
0000	○	01	Memory Module 1
0000	○	02	Display System
0000	○	03	Keyboard
0000	○	04	Memory Module 2
0000	○	05	Memory Module 3
0000	○	06	Memory Module 4
0000	○	07	Disk Drives (Optional)
0000	○	08	Network Controller-AT
0000	○	09	Cartridge Tape Drive
0000	○	10	EtherController-AT 0*
0000	○	11	EtherController-AT 1*

○ = LED Off.
○ = LED On.

* Applicable in early models only.

NOTICE: To reboot the operating system after a problem has been corrected, set the Normal/Service switch (SW2) to Normal (up). Then press the Reset button (SW1).

Starting Up

Start up your system in Normal mode for everyday computing activities. Apollo service representatives use Service mode to troubleshoot the Personal Workstation or the Domain network. **Therefore, you should always start up in Normal mode, unless directed otherwise by a service representative.** Start up in Normal mode as follows.

If you're starting up a **diskless** Personal Workstation, make sure its partner

- Is running the **netman** program
- Is running the minimum Software Release (SR) level for that model workstation, as shown in the following table:

Model Number	Minimum Software Release Level
DS3000	SR9.2.6
DS3010	SR9.5
DS3500	SR9.7.1
DS3550	SR9.7.1
DS4000	SR9.6.1
DS4500	SR10.1

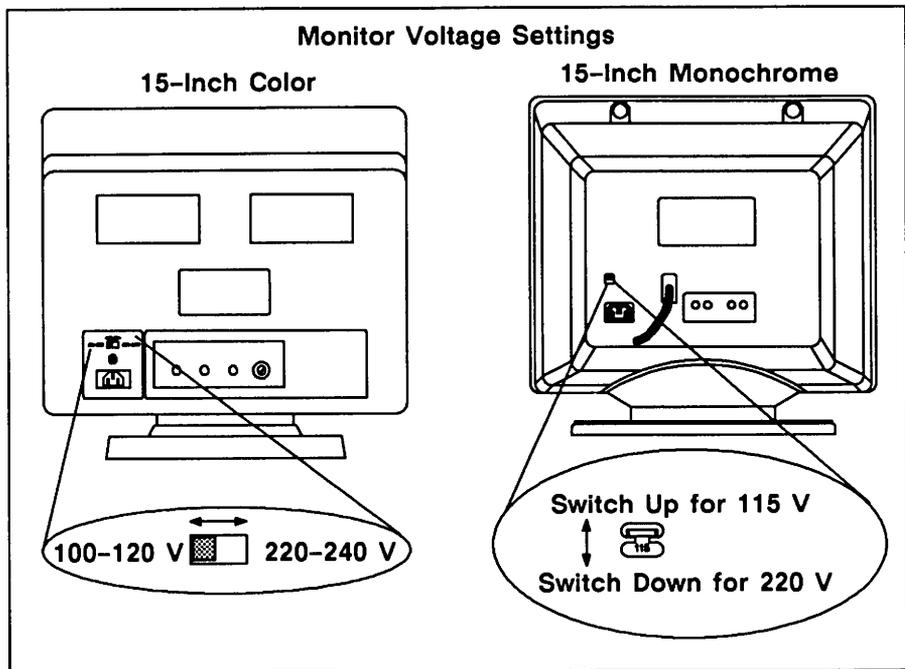
- Contains the **/sau8** (DS3000) or **/sau7** (DS3500/DS4000/DS4500) subdirectory of the node entry directory
- Has your node ID listed in its **sys/net/diskless_list**

Starting Up in Normal Mode

NOTICE: Before starting up your Personal Workstation, make sure that it has been installed and tested according to the instructions in *Unpacking and Installing Your Domain Personal Workstations and Servers*.

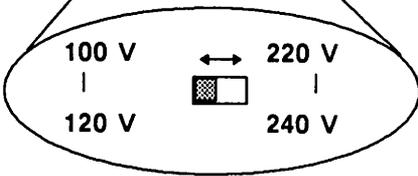
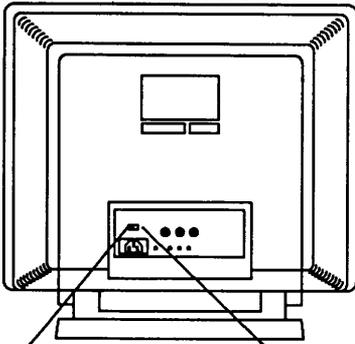
- 1 Make sure all cables are securely connected.
- 2 Make sure the voltage select switches are set correctly. The correct position for the U.S. and Canada is 100 to 120 V ac (labeled 115 V on some monitors). The 19-inch, 1280 x 1024 color monitor does not have a voltage select switch (input voltage is 90 V ac to 240 V ac.)

CAUTION: System damage will occur if the voltage selection switches are set incorrectly.

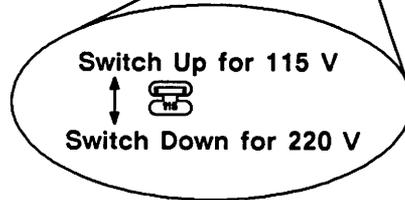
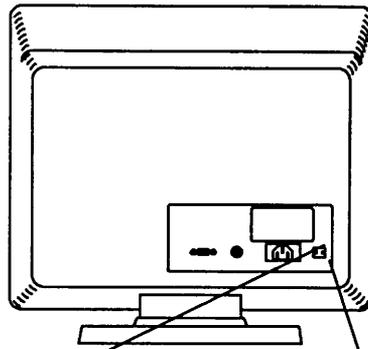


Monitor Voltage Settings

19-Inch Color

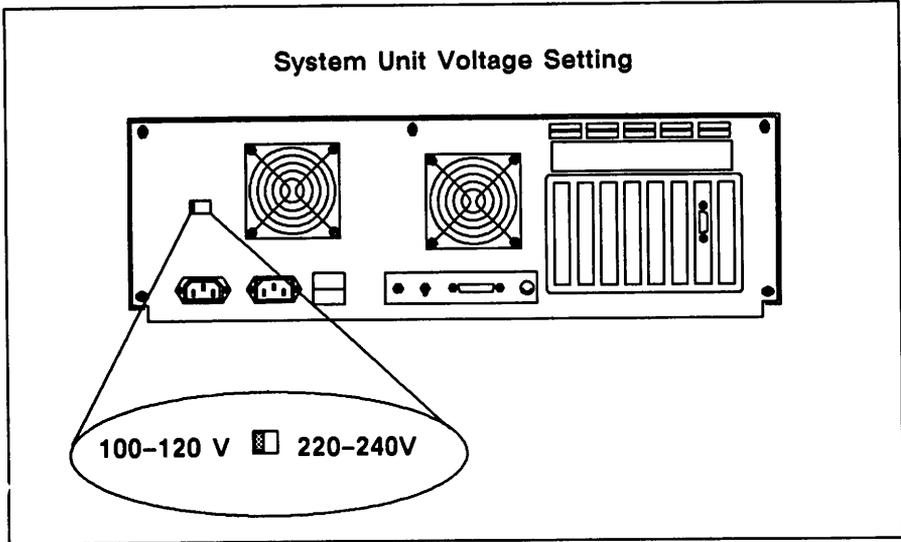


19-Inch Monochrome

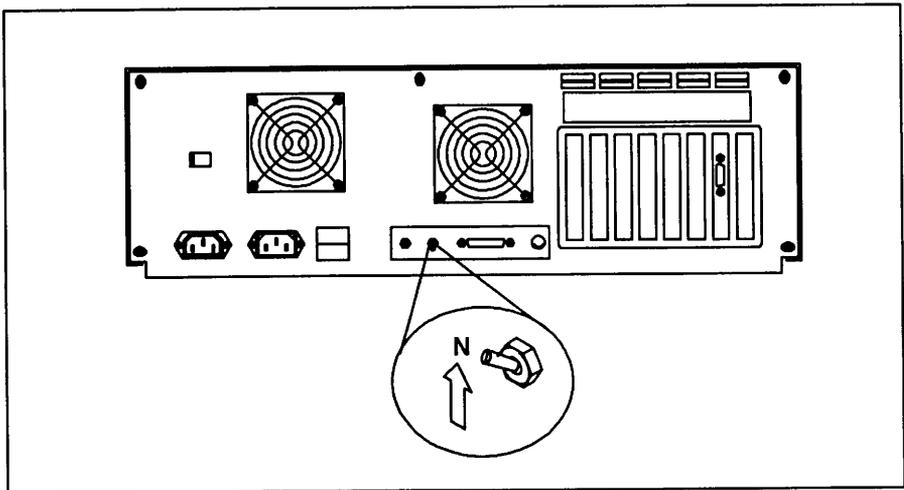


Notice: The 19-inch, 1280 x 1024 color monitor does not have an input voltage selection switch. Input voltage is 90 V ac to 240 V ac.

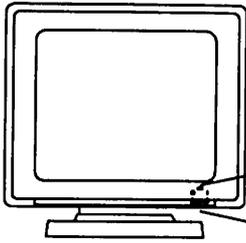
System Unit Voltage Setting



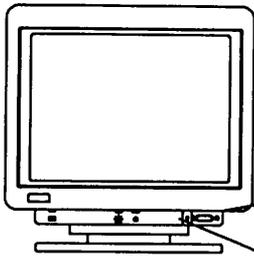
- 3 Set the Normal/Service switch (SW2) to Normal.



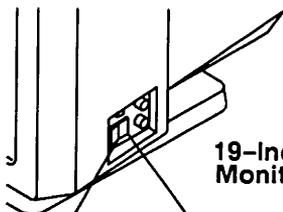
4 Switch on the monitor and system unit.



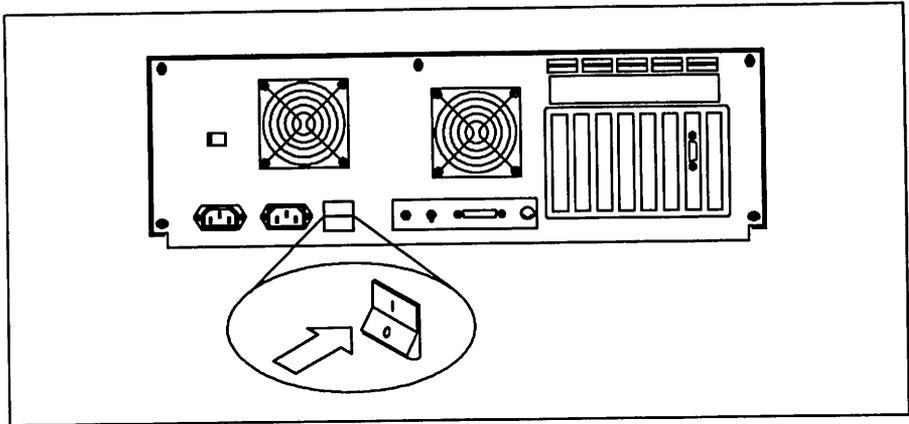
15-Inch Color, 15-Inch Monochrome, and 19-Inch Monochrome Monitors



19-Inch, 1280 x 1024 Color Monitor



19-Inch Color Monitor

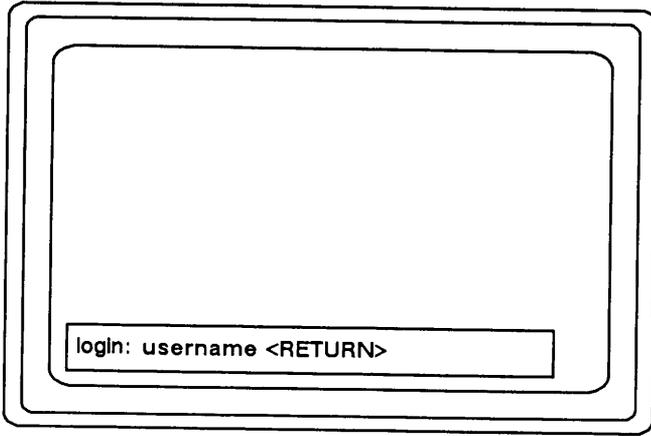


The Personal Workstation now runs a series of internal tests and displays the number of each test as it performs it. These tests, stored in memory on the CPU board and on the Winchester disk, check each major workstation subsystem.

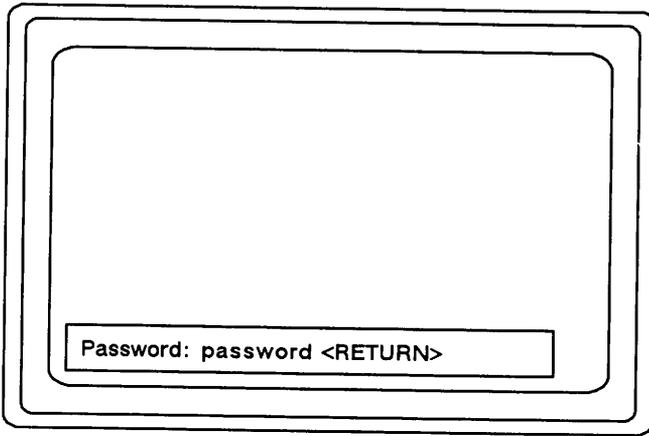
If you receive the message "CANNOT FIND SELF TEST", the workstation was unable to find some or all of the test software. This problem occurs when the workstation does not have the correct software revision and/or standalone utility (`/sau8` or `/sau7`) installed on its Winchester disk or its partner node's Winchester disk. Ask your System Administrator for help, or refer to the "Booting the Workstation" or "Booting the Server" section in *Unpacking and Installing Your Domain Personal Workstations and Servers* for more information.

If you receive the message "SELF TEST FAILED", write down the error code if applicable, or the error message printed, and then report the failure to **Apollo Customer Services at 1-800-2-APOLLO (1-800-227-6556) or your designated service representative**. If your office is outside of the United States, call your regional Apollo sales and service center.

- 5 Following the test, your workstation boots the operating system. Log in when you see the log-in prompt.



A terminal window with a double-line border. At the bottom, there is a text input field containing the text "login: username <RETURN>".



A terminal window with a double-line border. At the bottom, there is a text input field containing the text "Password: password <RETURN>".

Starting Up in Service Mode

If you ever have problems with your system, your service representative may ask you to start up in Service mode. This section explains how to do this.

NOTICE: Before starting up your workstation, make sure it has been installed and tested according to the instructions in *Unpacking and Installing Your Domain Personal Workstations and Servers*.

1 Make sure all the cables are connected securely.

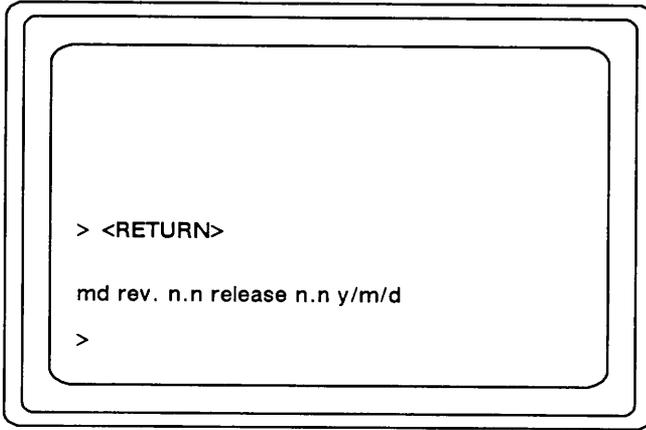
CAUTION: System damage will occur if the voltage selection switches are set incorrectly.

2 Make sure the voltage select switches are set correctly. The correct position for the U.S. and Canada is 110 to 120 V ac (labeled 115 V on some monitors). The 19-inch, 1280 x 1024 color monitor does not have a voltage select switch (input voltage is 90 V ac to 240 V ac.)

3 Set the Normal/Service switch (SW2) to Service (down).

4 Switch on the monitor and system unit.

- 5 When your screen displays the Mnemonic Debugger prompt (>), press the <RETURN> key.



CAUTION: Monitor screen damage will occur if the monitor is left on for extended periods of time with the screen image on the screen at high intensity.

When the > prompt returns, you can begin entering commands as instructed by your service representative.

- 6 When you've finished working in Service mode, and you're ready to load the operating system, reset the debugger with the following commands:

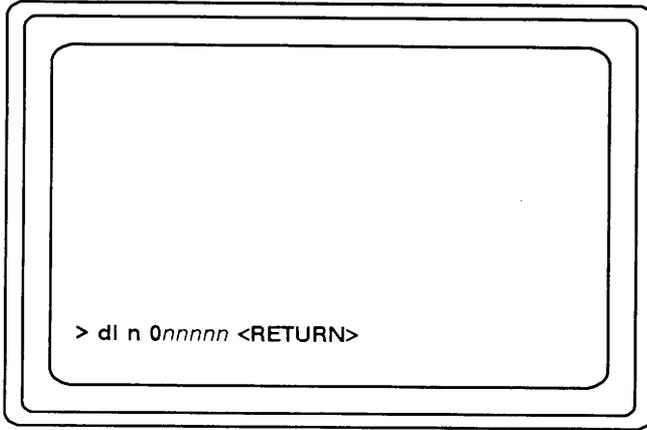
```
> re <RETURN>
> <RETURN>
md rev. n.n release n.n y/m/d
> <RETURN>
>
```

- 7 If your workstation has a disk, go to Step 8.

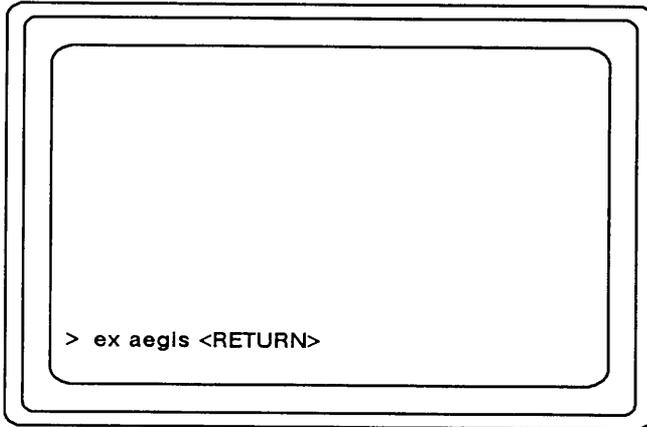
If your workstation is **diskless**, enter the **di n** command to request use of the programs on the partner's disk.

```
> di n <RETURN>
```

To boot from a system other than the partner node, type the following command, where *nnnnn* is the system's node ID. If the node ID begins with a letter (A-F), insert a zero (0) before the node ID.



8 Now boot the operating system by entering the following command:



If your workstation is **diskless**, you'll see several messages as the partner loads the operating system onto your workstation.

- 9 If the Personal Workstation had other than a normal shutdown, the disk may require salvaging. The system will display the message:

```
Domain/OS Kernel (n), revision (n) m/d/y 12:26:04
Boot volume needs salvaging
Proceed to bring up OS (and risk volume)?
```

Enter n and then the `ex salvol` command as follows:

```
Domain/OS Kernel (n), revision (n) m/d/y 12:26:04
Boot volume needs salvaging
Proceed to bring up OS (and risk volume)?n <RETURN>
> re <RETURN>
> <RETURN>
> ex salvol <RETURN>
```

If you enter **y** (which is not recommended), the system will attempt to reboot but it may fail. If it fails, it returns you to the boot shell where you must execute the **shut** command and then run **salvol**.

```
Domain/OS Kernel (n), revision (n) m/d/y 12:26:04
Boot volume needs salvaging
Proceed to bring up OS (and risk volume)?y <RETURN>
Apollo phase II shell Revision n.n y/m/d
) shut <RETURN>

Beginning shutdown sequence
Shutdown successful
> re <RETURN>
> <RETURN>
> ex salvol <RETURN>
```

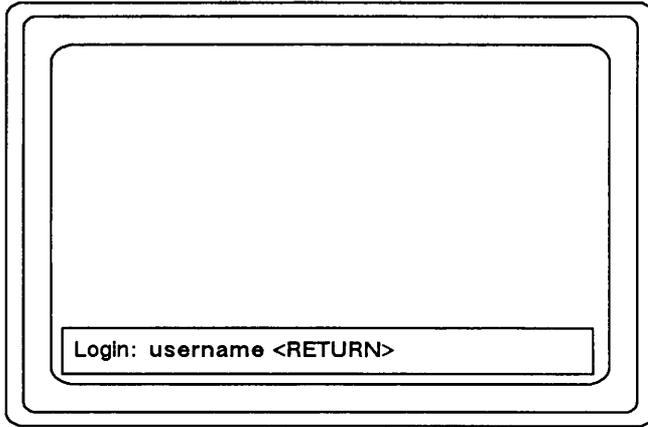
- 10 When you see the **)** prompt after the salvage, load the display manager by entering the **go** command as follows:

```

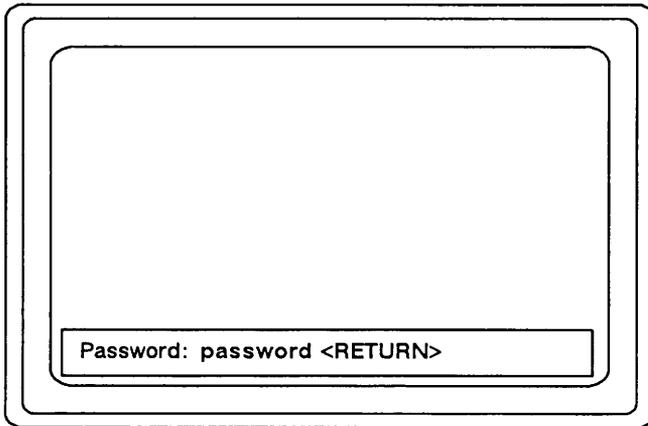
.
.
.
Apollo phase II shell Revision n.n y/m/d
) go <RETURN>
```

You'll see the message "Loading Display Manager" and then the Apollo logo. If the system requests that you reset the **calendar**, run the **calendar** program in Appendix C and then return to Step 8.

- 11 Log in when you see the log-in prompt.



A terminal window with a double-line border. At the bottom, there is a text prompt: "Login: username <RETURN>".



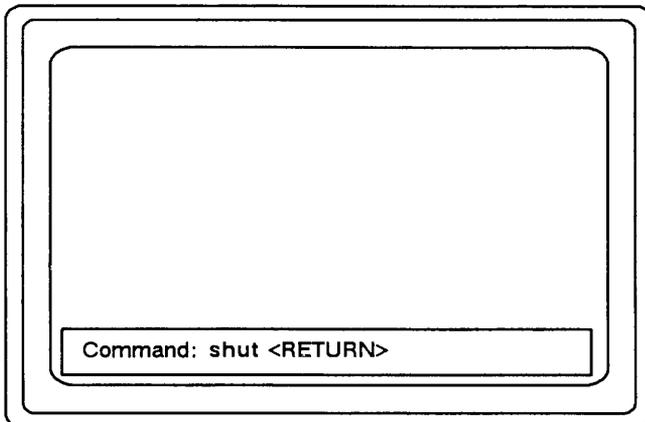
A terminal window with a double-line border. At the bottom, there is a text prompt: "Password: password <RETURN>".

Shutting Down

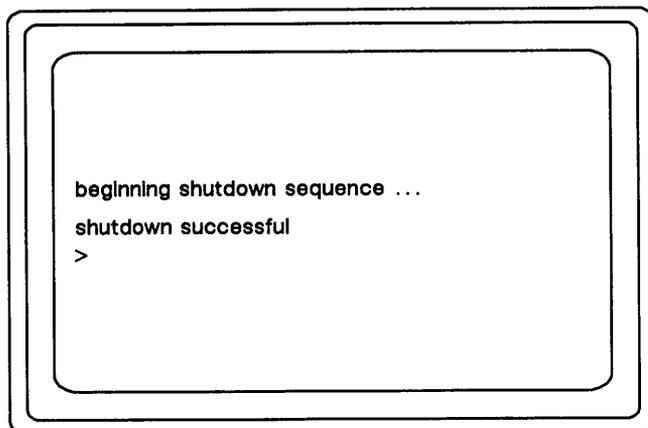
Shutting down your Personal Workstation is nearly the reverse of the start-up procedure.

NOTICE: If you plan to shut off workstation power, use the following procedure to avoid damaging the Winchester disk.

- 1 To stop all processes, press the <CMD> key and then enter the **shut** command.



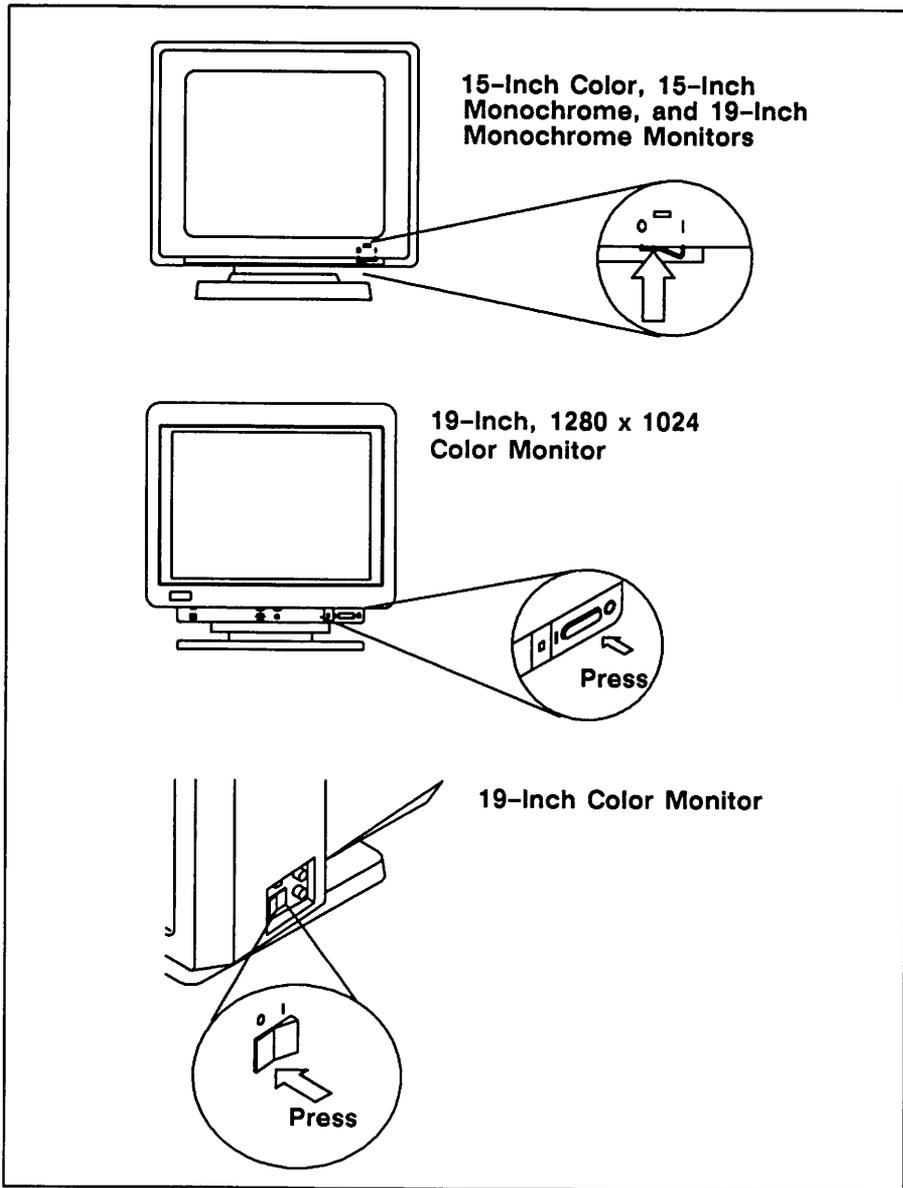
- 2 The following message appears on the screen:

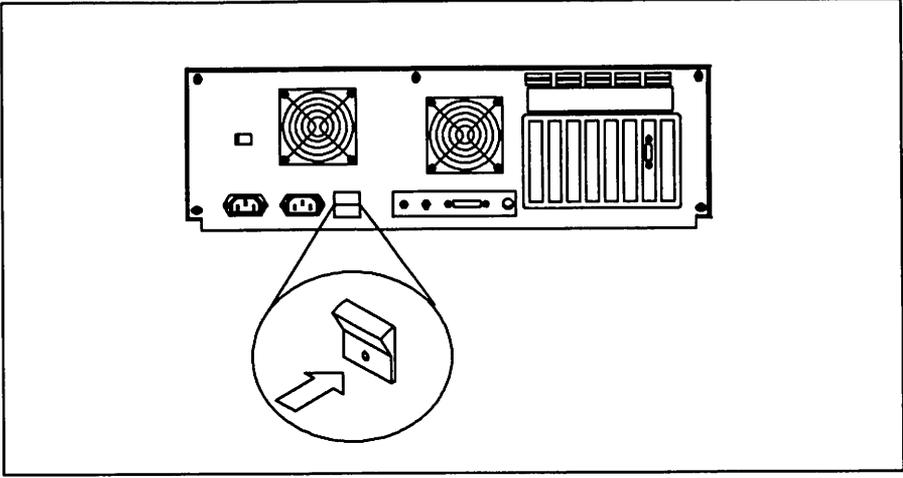


NOTICE: Never leave a floppy diskette or cartridge tape in the drive with the power off. Doing so may damage the drive.

- 3 Make sure there is no diskette or cartridge tape in your drive. If a diskette or cartridge tape is in the drive, remove it and store the diskette in its paper envelope, or the cartridge tape in its plastic case.

4 Shut off the monitor and system unit power switches.









Chapter 3

Using the Server

The server is a special configuration that consists of a system unit without a keyboard or display. While you cannot sit down at a server, find a log-in prompt, and log in directly, you can use the server in almost the same way as any other node. This chapter describes the following:

- Starting up
- Logging in and logging out
- Shutting down
- Executing programs

Starting Up

As with the Personal Workstation, you can start up the server in either Normal mode or Service mode. Use Normal mode for everyday computing activities. Service representatives use Service mode to troubleshoot the server or the Domain network. **You should always start up in Normal mode, unless directed otherwise by a service representative.** The following sections describe how to start up the server in both Normal and Service modes.

If you're starting up a diskless server, make sure its partner

- Is running the `netman` program
- Is running the minimum Software Release (SR) level, as shown in the following table:

Model Number	Minimum Software Release Level
DS3000	SR9.2.6
DS3010	SR9.5
DS3500	SR9.7.1
DS3550	SR9.7.1
DS4000	SR9.6.1
DS4500	SR10.1

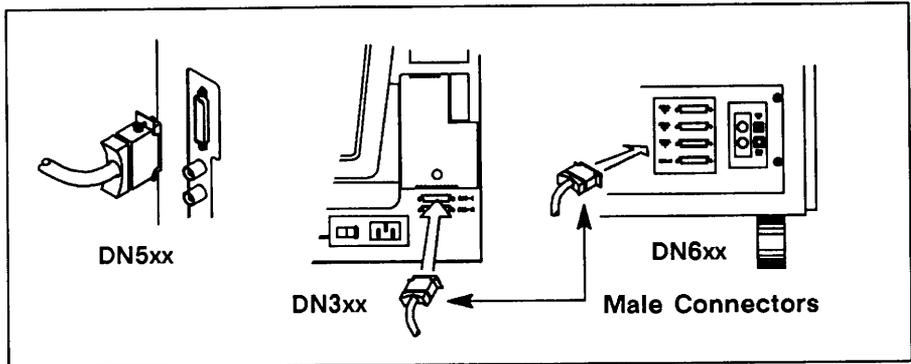
- Contains the `/sau8` (DS3000) or `/sau7` (DS3500/DS4000/DS4500) subdirectory of the node entry directory
- Has the node ID for your server listed in its `sys/net/diskless_list` file.

Connecting a Terminal or Domain Node

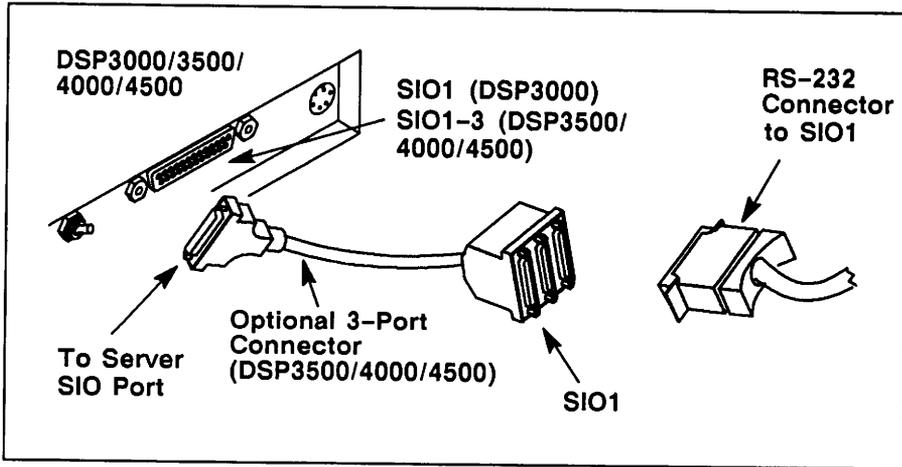
The start-up procedures described in this chapter require you to enter commands. Since the server does not have a keyboard or display, to enter commands at startup, you must attach a terminal or Domain node to the SIO1 connector on the server. The following procedure describes how to connect a terminal or Domain node to the server. You will need an RS-232 cable for this procedure.

- 1 Obtain an RS-232 cable as described in the "Booting the Server" section of *Unpacking and Installing Your Domain Personal Workstations and Servers*.
- 2 If you are connecting a *terminal* to the server, connect one end of the RS-232 cable to the terminal's RS-232 connector.

If you are connecting a *Domain node*, connect one end of the RS-232 cable to the node's SIO1 connector. The node should be in the same network loop as the server.



- 3 Connect the other end of the cable from the terminal or node to SIO1. If you are using the optional 3-port interface cable for the DSP3500/3550/4000/4500, connect to SIO1 on the 3-port interface cable.



- 4 *If you connected a terminal to the server, go to Step 1 of one of the following sections "Starting Up in Normal Mode" or "Starting Up in Service Mode" of this guide.*

If you connected a node, go on to Step 5.

- 5 Log in to the node.

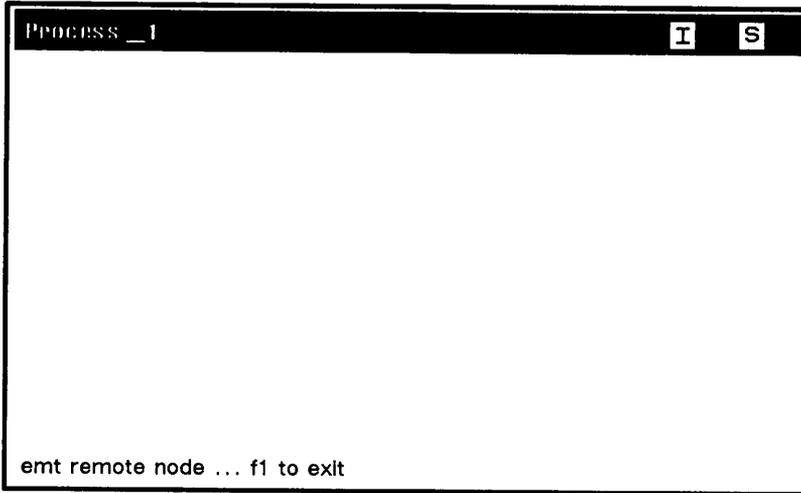
- 6 Configure the node to emulate a terminal by typing the following shell command:

```
Process _1 I S
-----
SysV $ emt
BSD  % emt
Aegis $ emt
```

- 7 When you receive the emt> prompt, type the following sequence of commands:

```
Process _1 I S
emt> llne 1
emt> raw
emt> <F1>
```

When you press the <F1> key, the node displays the following window and message:



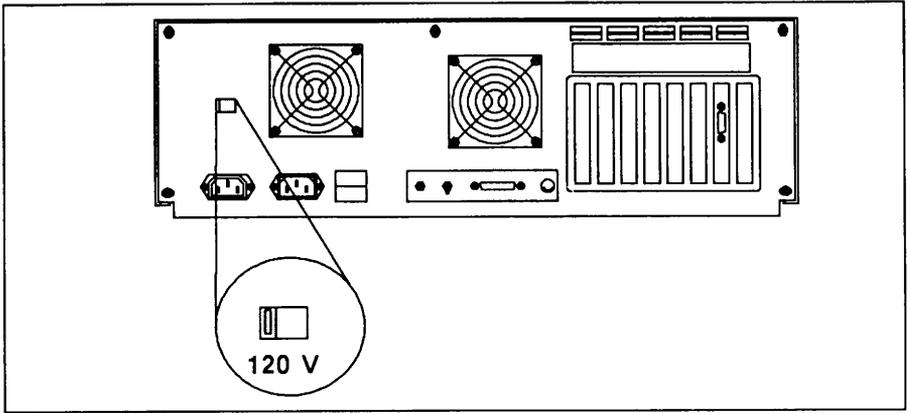
At this point, the node connection procedure is complete. Go to Step 1 of one of the following sections "Starting Up in Normal Mode" or "Starting Up in Service Mode" of this guide.

Starting Up in Normal Mode

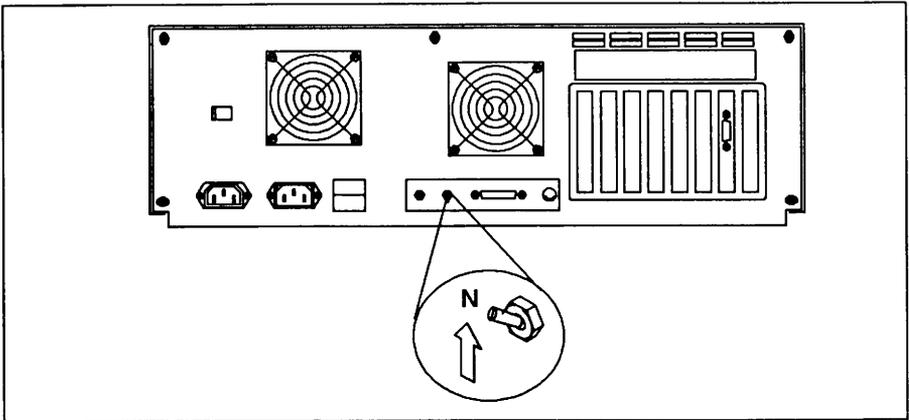
Before starting up your server, make sure it has been installed and tested according to the instructions in *Unpacking and Installing Your Domain Personal Workstations and Servers*.

- 1 Connect a node or terminal to the server as described in the previous section.

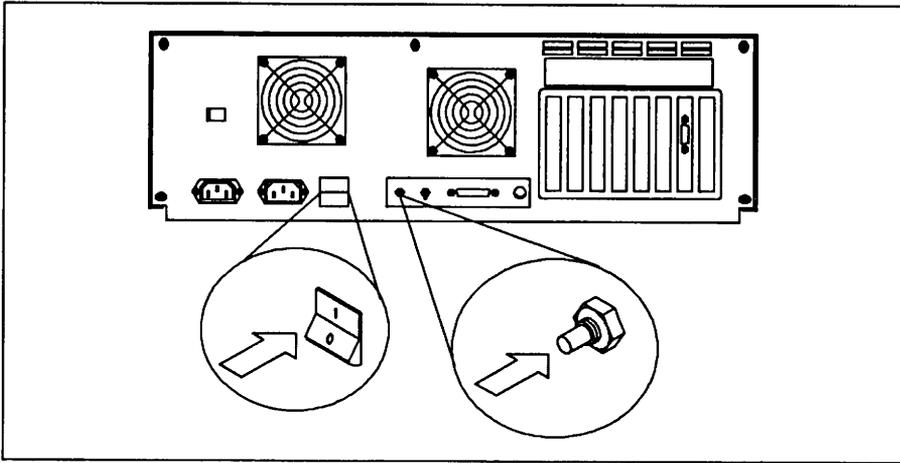
- 2 Make sure all cables are connected securely and that the voltage select switches are set correctly. The correct position for the U.S. and Canada is 120 V ac.



- 3 Set the Normal/Service switch (SW2) to Normal.



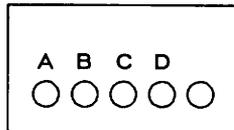
- 4 Switch on the system unit and press the Reset button (SW1).



The server runs a series of tests (for about 1 minute) and then boots the operating system.

- 5 When the server boots successfully, LED "D" blinks continuously. **If the server boots successfully, the Normal mode start-up procedure is complete.** To log in to the server, follow the procedure described in the "Logging in and Logging Out" section later in this chapter.

Successful Boot



In some cases, the attached node or terminal may display a message that indicates you must reset the calendar. If you receive this message, proceed to Appendix C, reset the **calendar**, and then continue with Step 6.

If the node does not boot successfully, and you do not receive the calendar message, call Apollo Customer Services or your designated service representative as described in Appendix A.

- 6 Type the following command(s) to boot the operating system:

```
> di n <RETURN> (diskless servers only)
> ex aegls <RETURN>
```

When the server boots successfully, LED "D" blinks continuously. To log in to the server, follow the procedure described in the "Logging In and Logging Out" section later in this chapter.

- 7 To disconnect the terminal or node, disconnect the RS-232 cable from the server's SIO connector. If you connected a node, and you want to return control to the shell process, type the following sequence of commands:

```
Process _1 I S
<F1>
emt> q
```

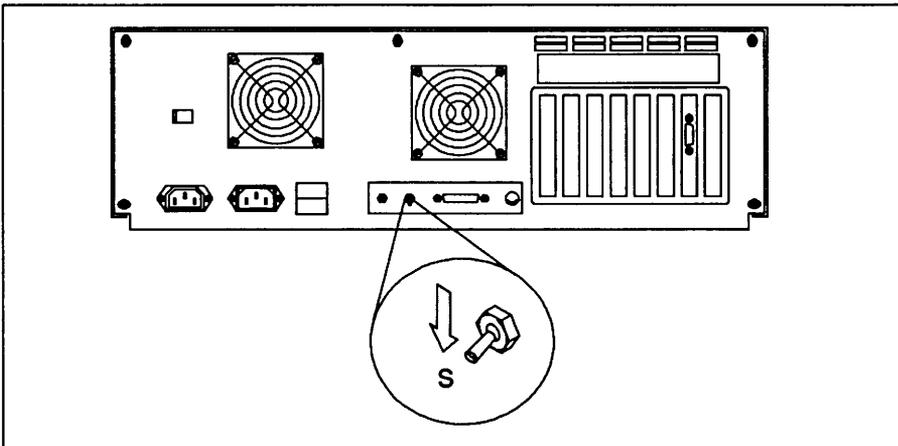
Starting Up in Service Mode

Before starting up your server, make sure it has been installed and tested according to the instructions in *Unpacking and Installing Your Domain Personal Workstations and Servers*.

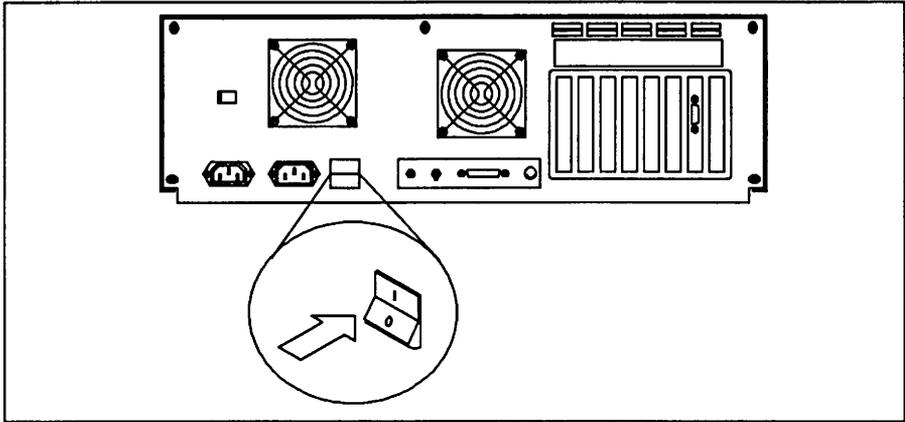
- 1 To start up a server in Service mode, you must connect a terminal or Domain node (configured to act as a terminal) to the server's SIO connector. The terminal or node acts as a display for the server, allowing you to receive status messages and use the service and debugging capabilities of the Mnemonic Debugger (MD).

Refer to the "Connecting a Terminal or Domain Node" section earlier in this chapter for instructions. When you're finished connecting the terminal or node, proceed with Step 2.

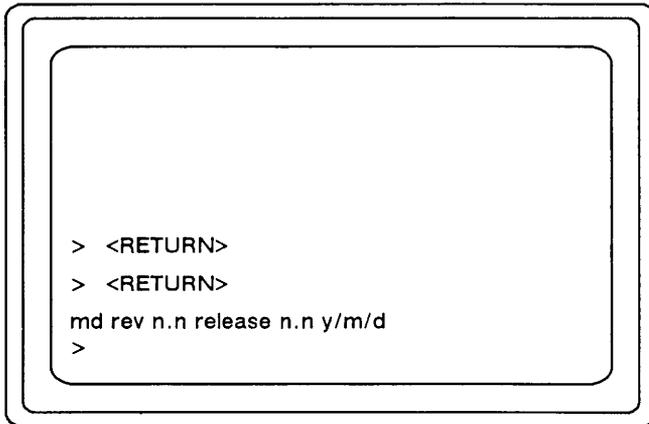
- 2 Make sure all of the cables are connected securely.
- 3 Set the Normal/Service switch (SW2) to Service.



- 4 Switch on the system unit.



- 5 Press the <RETURN> key twice as shown. The Mnemonic Debugger (MD) program displays the following message and prompt:



CAUTION: Monitor screen damage will occur if the monitor is left on for extended periods of time with the same image on the screen at high intensity.

- 6 When the MD displays the date (y/m/d) and the > prompt, you can begin entering commands as instructed by your service representative.

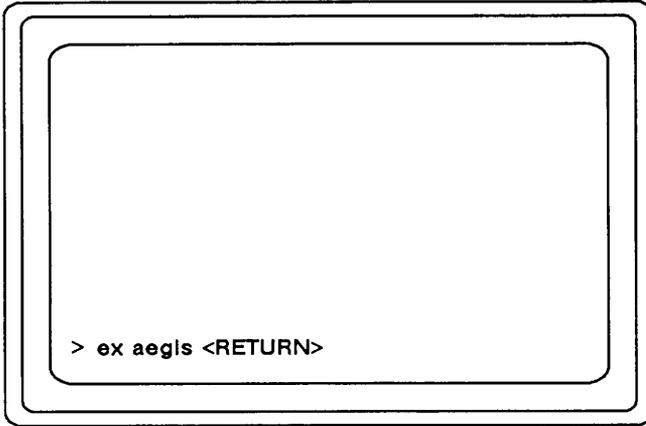
- 7 When you're ready to boot the operating system, if your server is diskless, continue with Step 8. If your server contains a disk, go to Step 9.
- 8 If your server is diskless, type the following command to direct the server to boot from its partner node:

```
> dl n <RETURN>
```

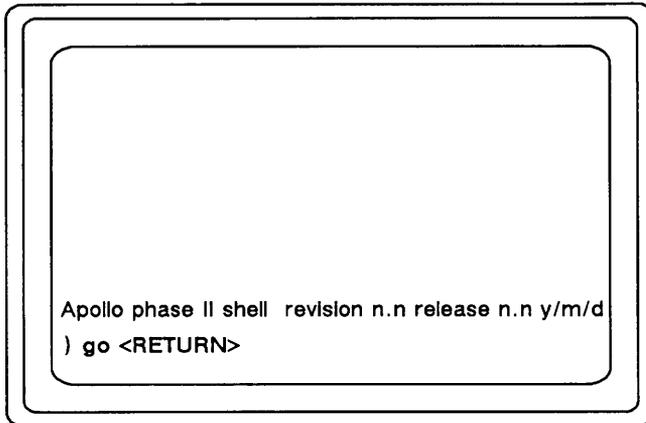
To boot from a system other than the partner node, type the following command, where *nnnnn* is the system's node ID. If the node ID begins with a letter (A-F), insert a zero (0) before the node ID.

```
> dl n 0nnnnn <RETURN>
```

- 9 Load the operating system by typing the following:

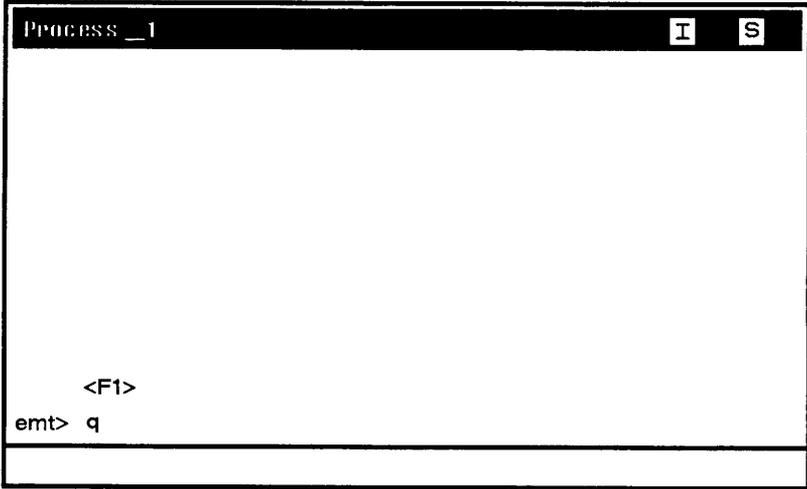


- 10 At the boot shell prompt,), type the following:



*In some cases, the attached node or terminal may display a message that indicates you must reset the **calendar**. If you receive this message, proceed to Appendix C, reset the **calendar**, and then repeat Steps 9 and 10.*

- 11 When the server boots successfully, LED "D" blinks continuously. To log in to the server, follow the procedure described in the "Logging in and Logging Out" section, which begins on the next page.
- 12 To disconnect the terminal or node, disconnect the RS-232 cable from the server's SIO1 connector. If you connected a node, and you want to return control to the shell process, type the following sequence of commands:



A terminal window titled "Process _1" with "I" and "S" icons in the top right corner. The window contains the text "<F1>" and a shell prompt "emt> q".

```
Process _1 I S
<F1>
emt> q
```

Logging In and Logging Out

Because the server does not have a keyboard or display monitor, you must log into it from another Domain node in the network. When the server boots, it starts a process called the server process manager (**spm**). The **spm** makes it possible for you to create a remote process on the server, log in to the process, and execute commands and programs, all from another node in the network.

Before you can log in, the server must be properly installed according to the instructions in *Unpacking and Installing Your Domain Personal Workstations and Servers*. Also, check the LEDs to make sure the operating system is up and running. The operating system is running when LED "D" blinks continuously.

- 1 Go to a node in the network and log in.
- 2 Check to see if the node is running the mailbox helper (**mbx_helper**) program by entering the process status command as follows:

	Process _1
SysV	\$ ps -e
BSD	% ps -g
Aegis	\$ pst

The process status command lists all of the processes currently running on the node. To see whether **mbx_helper** is running, look in the far right column of the display under "Process Name."

```

Process _1
Node: nnnn
Time: Thursday, yy/mm/dd 11:06:33 am (EDT)
-----
Processor  PRIORITY  Program  State  Process Name
Time (sec) mn/cu/mx Counter
-----
68295.39   - - - - -   - - - - -   - - - - -   <Null Process>
492.973    - - - - -   - - - - -   - - - - -   <Aegis Process>
221.189    16/16/16   1F74E     Wait   display manager
0.492      3/14/14   1F23E     Wait   netman
0.768      3/13/14   1F23E     Wait   mbx_helper
28.381     3/14/14   1F6AE     Wait   process_server
1.062      3/11/14   <active>  Ready  process_1
-----
$

```

Aegis

```

Process _1
$ ps -e
PID TTY      TIME COMMAND
1 ?          11:23 dm
2 ?          3933:36 null
3 ?           1:54 purifier
4 ?           0:04 purifier
5 ?           4:16 unwired_dxm
6 ?           0:00 pinger
7 ?          113:58 netreceive
8 ?           0:57 netpaging
9 ?           1:00 wired_dxm
629 ?         0:00 ps
627 ?         0:00 mbx_helper
623 ?         0:00 csh
622 ?         0:00 sh
621 ?         0:00 start_sh
-----
$

```

SysV

```
Process _1 I S

% ps -g
PID  STAT  TIME  COMMAND
622  S      0:00  /com/sh
623  R      0:00  /bsd4.3/bin/csh
627  S      0:00  /sys/mbx/mbx_helper
630  R      0:00  ps -g

BSD %
```

- 3 If the node is running mailbox helper, go on to Step 4. Otherwise, start `mbx_helper`. Press `<CMD>`, then type the following:

```
Command: cps /sys/mbx/mbx_helper
```

To verify that mailbox helper is running, repeat Step 2.

- 4 Create a remote process on the server by typing the following command, where *nnnnn* is the server node ID number:

	Process _1
SysV	<code>\$ crp -on nnnnn</code>
BSD	<code>% crp -on nnnnn</code>
Aegis	<code>\$ crp -on nnnnn</code>

- 5 When the system creates the remote process, it creates a window over the window in which you typed the `crp` command, and displays the node entry directory name of the connected node. (If you log in to a diskless server, `//entry` is the entry directory of the server's partner node.)

Process _1
<code>crp -on nnnnn</code> <code>Connected to node nnnnn "//entry"</code>
login:

- 6 Log in to the remote process by typing your username and password as follows:

```
Process _1      I  S
Connected to node nnnnn  "//entry"

login: username
Password: password
```

If you log in as user, simply press the <RETURN> key at the password prompt.

You are logged in to the process on the server when a message similar to the following appears:

```
Process _1      I  S
Connected to node nnnnn  "//entry"

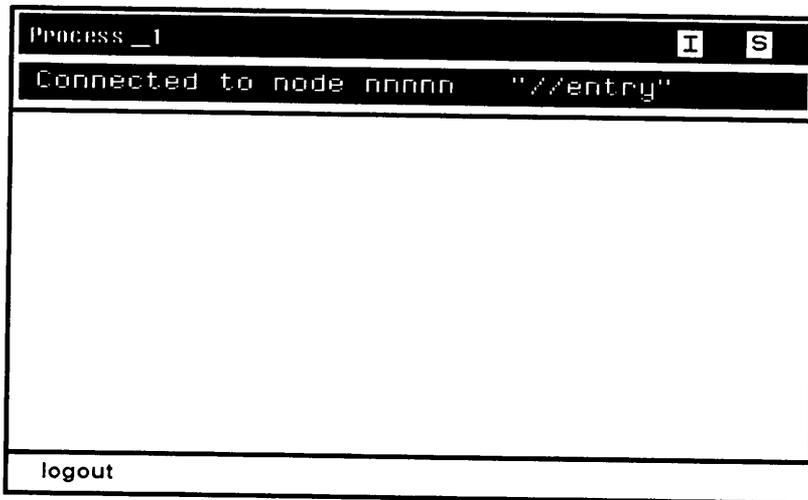
Logged in as user.none.none  Saturday, y/m/d 16:32:30
```

When you log into a server as `user`, the operating system sets the working directory to the entry directory on either the server or its partner node (if the server is diskless). When you log in with your own log-in name, the operating system sets the working directory to your home directory. Refer to the appropriate *Using Your Environment* manual for a complete description of directories. (Refer to the Preface for manual names.)

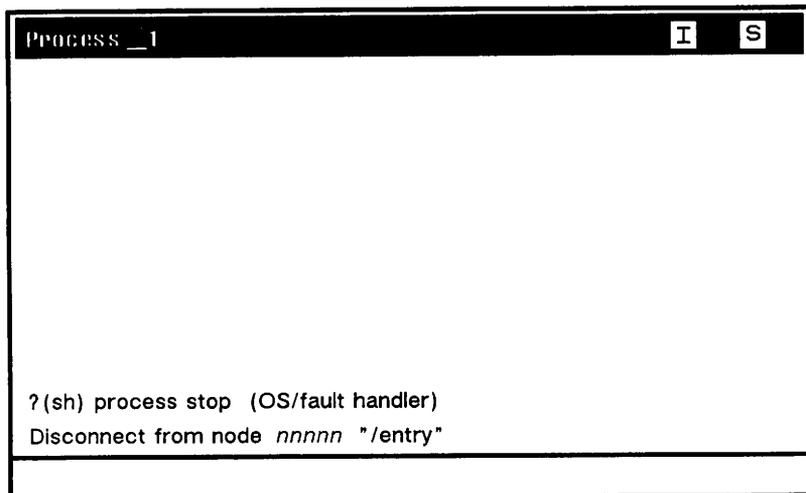
- 7 The remote process you logged into is running the shell program. You can use this "remote process shell" to perform the operating system functions described in the "Executing Programs" section, which follows.

NOTICE: In the remote process shell, the prompt appears on the last line in the shell transcript pad instead of in the shell input window.

- 8 To log out of the server, terminate the remote process by typing:



The **logout** command disconnects the node from the remote process, and the following message appears:



A terminal window titled "Process _1" with "I" and "S" icons in the top right corner. The window contains the following text:

```
?(sh) process stop (OS/fault handler)
Disconnect from node nnnnn "/entry"
```

Executing Programs

The server can execute any program that a node with a keyboard and display can execute, except those that rely on Display Manager (DM) software. This section outlines the minor differences in running programs on the server.

Using Shell Commands

You invoke shell commands on the server from the remote process shell that you created when you logged into the server. The remote process shell is different from the standard shell in that the Aegis \$ prompt appears as the last line in the transcript window, not in the input window. The system reads input lines immediately and sends them to the remote process on the server. Normally, the system queues commands in the shell input window.

Running Programs

You can run any program on the server, except those that do graphics or make pad calls. Because these functions require the DM and display hardware, they will not run. If a program terminates with the error message "stream is not a pad," it has attempted to make a pad call.

Editing and Reading Files

Once logged in to the server from another node, you can create and edit files by using the node's Display Manager (DM). The DM, however, does not know the working or naming directories set in the remote process shell. By default, it uses the working and naming directories that were set at the time you created the remote process. Therefore, when reading or editing a file, always use an absolute pathname to specify the file's location in the naming tree. For a detailed description of how to use pathnames, refer to the appropriate *Using Your Environment* manual.

Creating Server Processes

A server process is a process running on a Domain node or server processor that provides access to some service, such as the use of a peripheral. Server processes usually run without pads and windows. They also run regardless of log-in or log-out activity. This section contains information about creating server processes on the server. For more general information about server processes, refer to the appropriate *Managing System Software* manual.

To run server processes, the server uses the server process manager (`spm`) and the mailbox helper (`mbx_helper`). The server starts these programs when it loads the operating system. Once the server is running the operating system, you can start server processes on it by using the `create_process` (`crp`) shell command.

For example, to start the print server process for the Spinwriter* printer, go to a node in the network, and invoke the `crp` command as follows:

```
crp /com/prsvr -n spin_server -on nnnnn -gps
```

where *nnnnn* is the server node ID number.

The *Command Reference* manual for your operating environment contains more information about the `crp` command and its options.

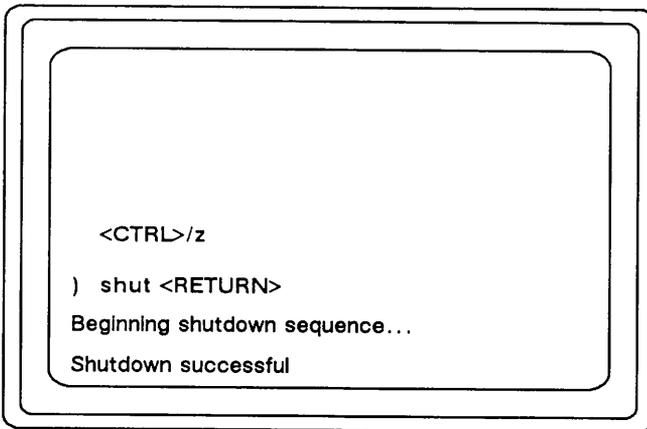
*Spinwriter is a registered trademark of NEC Inc.

Shutting Down

Before you shut down the server, if you are logged in from another node in the network, log out.

NOTICE: If you plan to shut off the server's power, use the following procedure to avoid damaging the Winchester disk.

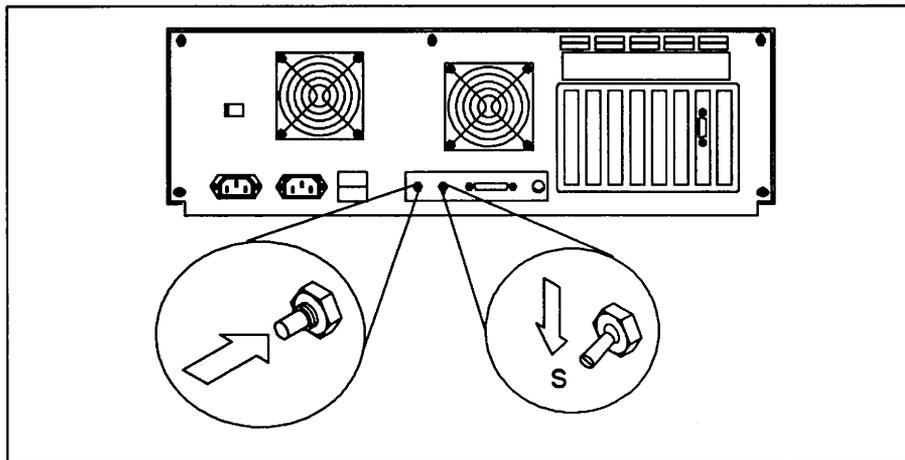
- 1 Connect a terminal or node to the server according to the instructions in the "Connecting a Terminal or Domain Node" section. When you're finished connecting the terminal or node, proceed with Steps 2 and 3 for disked servers, or Steps 4 and 5 for diskless servers.
- 2 *For disked servers only:* Enter the following sequence of commands:



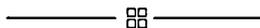
```
<CTRL>/z
) shut <RETURN>
Beginning shutdown sequence...
Shutdown successful
```

- 3 When you see the "Shutdown successful" message, turn the system unit's power switch to the **OFF (0)** position.

- 4 For diskless servers only: Set the Normal/Service switch (SW2) to Service and then press the Reset button (SW1).



- 5 Then turn the system unit's power switch to the **OFF (0)** position.







Chapter 4

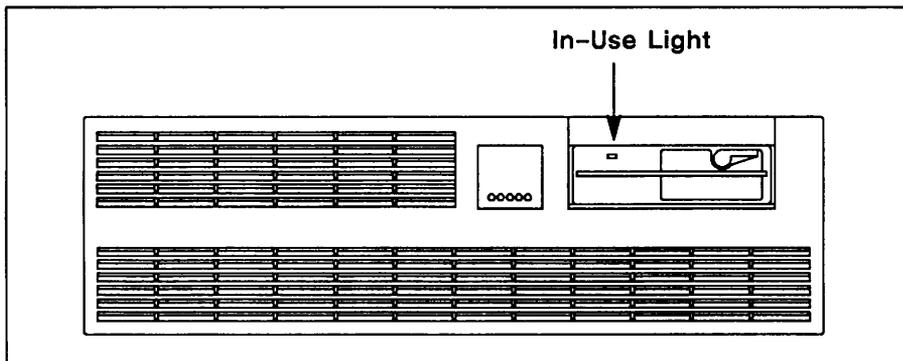
Using the Diskette Drive

This chapter tells you how to use the diskette drive by describing the following:

- Handling diskettes
- Inserting, initializing, and mounting diskettes
- Dismounting and removing diskettes

The diskette drive has an amber in-use light that comes on when the diskette drive is in use. The in-use light, which is in the same location on all Personal Workstations, times out three minutes after the drive has finished data transmission.

NOTICE: Do **not** remove a diskette from the drive until the screen prompt reappears. Doing so will damage the diskette surface.



NOTICE: Use only 5 1/4-inch, high-capacity, double-sided, double-track (96-tpi) diskettes in the diskette drive. You can purchase these diskettes from vendors such as Maxell and Dyan.

Handling Diskettes

To perform reliably, diskettes require special care. Please consider the following instructions as you use your diskette drive because improper handling can destroy information stored on a diskette.

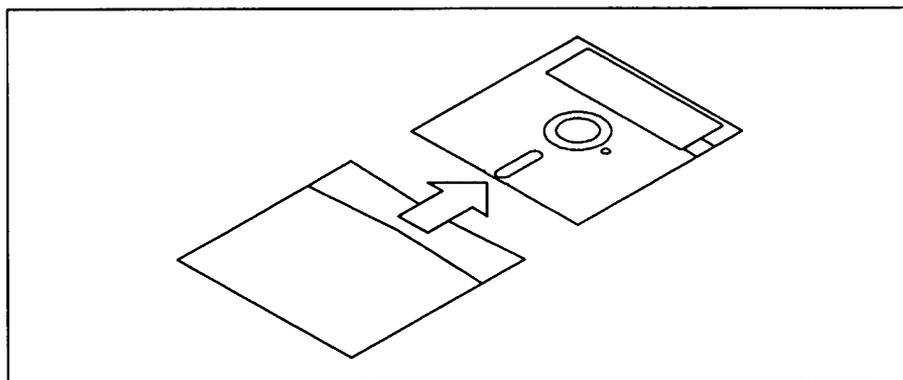
- Hold a diskette by the edges of its protective jacket. Never touch the exposed areas of the diskette surface.
- When you're not using a diskette, store it in its paper envelope.
- Use only soft-tip pens to write on diskette labels. Never use pencils or ballpoint pens.
- Never bend or fold a diskette.

- Keep diskettes away from magnetic fields. Telephones, electronic calculators, and paper clips are common magnetic sources.
- Don't expose diskettes to dust or extreme temperatures. Avoid placing them in direct sunlight.
- Never clean a diskette.
- Always switch on the power before inserting a diskette into the drive.
- Never leave a diskette in the drive when the power is switched off.

Inserting, Initializing, and Mounting Diskettes

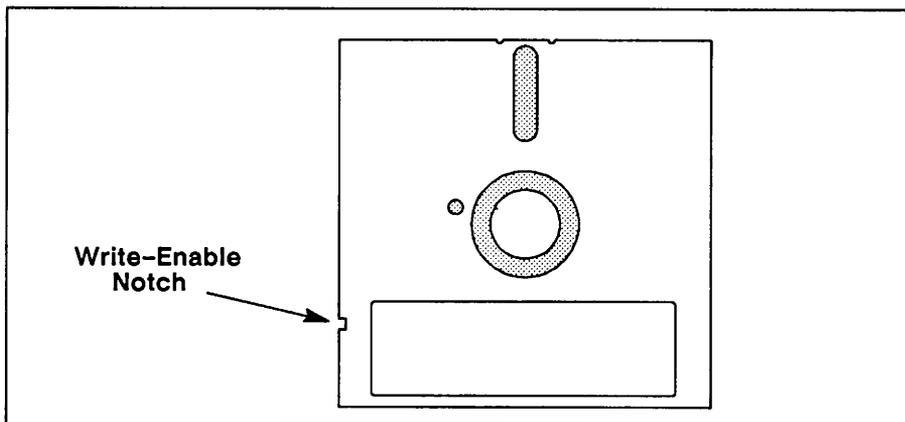
NOTICE: Always power on the system before inserting a diskette in its diskette drive.

- 1 Take the diskette out of the paper envelope. Some of the diskette surface is exposed through the cutouts in the plastic jacket.



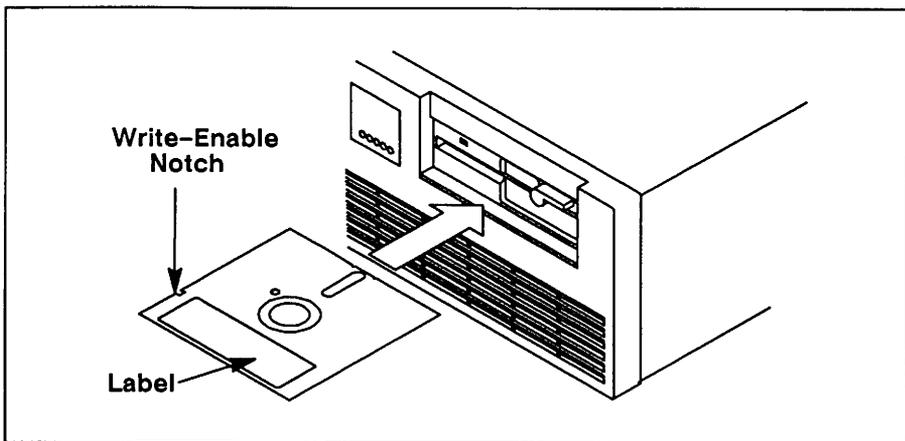
NOTICE: Don't touch the diskette surface or try to remove it from its jacket.

- 2 You can only store or change information on a diskette when the write-enable notch is exposed. So, before performing a write (store) operation, make sure that the notch is exposed (remove the paper tab that covers the notch).

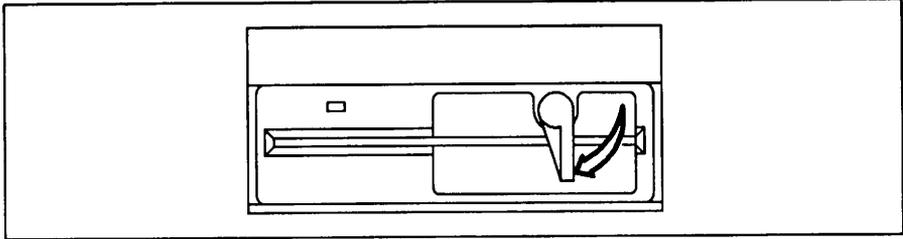


- 3 Insert your diskette into the drive with the write-enable notch on the left and the label facing up. Continue to insert the diskette until it clicks into place.

NOTICE: To write-protect the data on the diskette, place the paper tab over the write-enable notch.



- 4 Turn the lever clockwise to close the diskette drive.



- 5 The first time that you use a new diskette, you must **initialize** it before you can write files to it. If your diskette has already been initialized, go to Step 10.

If you're not sure if a diskette has been initialized, try to mount it as described in Step 10. If you're unable to mount it, return to this step.

To initialize a diskette, log in and then type:

```
Process _1 [I] [S]
-----
SysV $ invol
-----
BSD  % invol
-----
Aegis $ invol
```

NOTICE: If you're using a server, refer to the "Logging In and Logging Out" section in Chapter 3 for specific log-in instructions.

- 6 The `invol` command runs a program that prompts you for information. Respond to the prompts as shown in the following screens.

```
PROCESS _1 I S
invol (initialize_volume), revision xx mm/dd/yy
Options are:
1 - Initialize virgin physical volume.
2 - initialize partial physical volume, preserving existing logical
  volumes.
3 - re-Initialize an existing logical volume.
4 - delete a logical volume.
5 - list logical volumes.
6 - list badspots on volume.
7 - input and record badspot information.
8 - create or modify an os paging file on an existing logical
  volume.
9 - add to existing badspot list.
10 - display/change sector interleave factor for a logical volume.
11 - pre-SR10: initialize virgin physical volume.
12 - pre-SR10: initialize partial physical volume, preserving
  existing logical volumes.

Option: 1
```

- 7 Continue responding to the prompts as follows:

```
PROCESS _1 I S
Controller type
(W=Winchester, S=Storage module, F=Floppy): f

Verification options are:
1 - no verification
2 - write all blocks on the volume
3 - write and re-read all blocks on the volume
Enter verification option: 3

Expected average file size, in blocks,
(CR for default, 5 blocks):<RETURN>
```

- 8 Continue responding to the prompts as follows:

```
Process _1 I S
For each logical volume to be formatted, enter the
logical volume size, followed by the name, in the form
"size, name". Up to 10 volumes may be specified.
Terminate input with a blank line.
There are 1231 blocks available.
Volume 1: 1231
Enter badspots between physical disk addresses 1 and 4CF,
one per line. Badspots must be input in (hex) physical
disk address form. Terminate badspot entry with a blank
line. -q will abort the run.
: <RETURN>

Is the badspot information you entered correct? y
```

- 9 Continue responding to the prompts as follows:

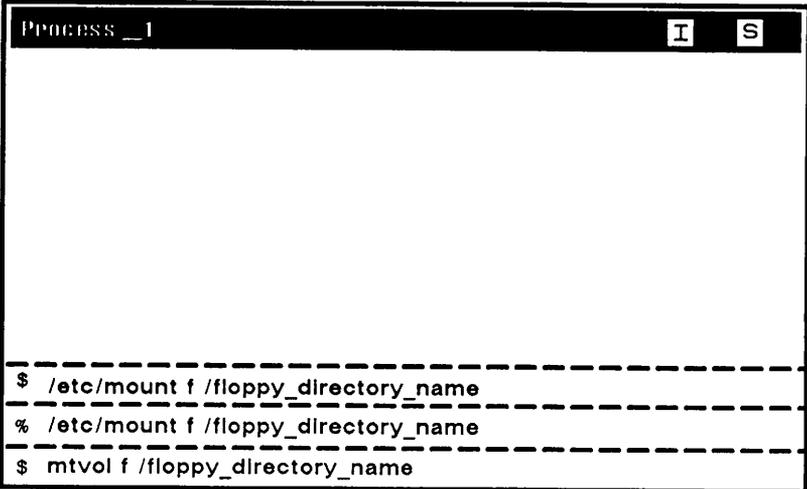
```
Process _1 I S

Enter physical volume name: anyname
.
.
Initialization complete.

Anything more to do? n
```

NOTICE: The initialization takes approximately 5 minutes.

- 10 Now mount the diskette by entering the mount volume command as follows. This command makes the storage areas in the logical volume available to the operating system.

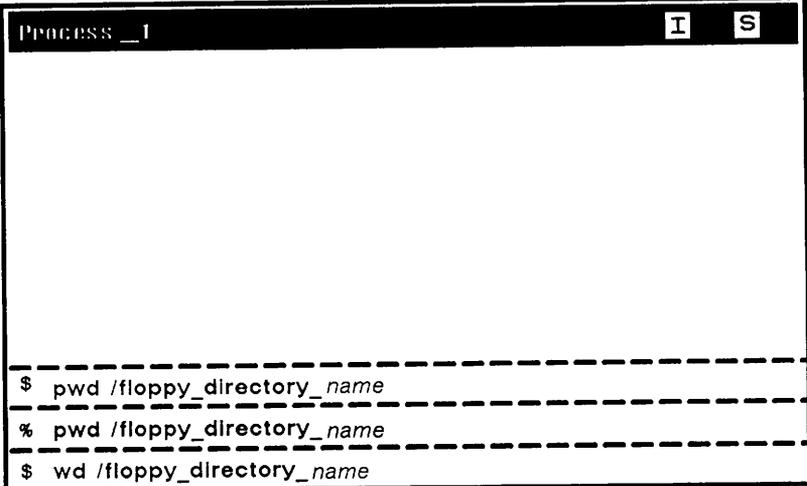


```
Process _1 [I] [S]
-----
SysV $ /etc/mount f /floppy_directory_name
-----
BSD  % /etc/mount f /floppy_directory_name
-----
Aegis $ mtvol f /floppy_directory_name
```

The **f** option specifies that you're mounting a floppy diskette. **/floppy_directory_name** becomes the top-level directory name for the files stored on your diskette.

NOTICE: If your diskette is not initialized, you'll receive the message "Unable to mount volume, bad disk format." If this happens, go back to Step 5.

11 Set your working directory to the floppy directory.



```
Process _1
```

SysV \$ pwd /floppy_directory_name

BSD % pwd /floppy_directory_name

Aegis \$ wd /floppy_directory_name

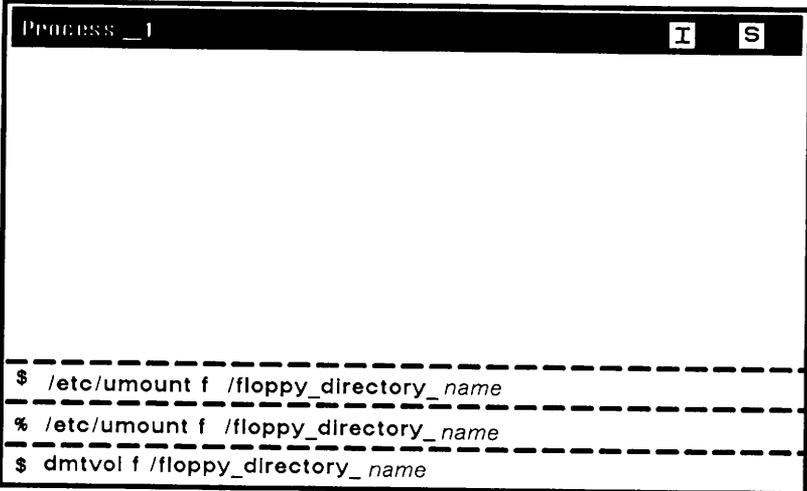
You can now create directories and files on the floppy, list directories, copy to and from the floppy, and perform any other operations that you normally do with directories and files.

Dismounting and Removing Diskettes

When you've finished using a diskette, you must dismount it. Dismounting makes the storage areas in the logical volume inaccessible to the operating system.

NOTICE: You must dismount the diskette before removing it from the drive. Otherwise, you may lose the information stored on it.

1 To dismount the diskette, enter the following command:

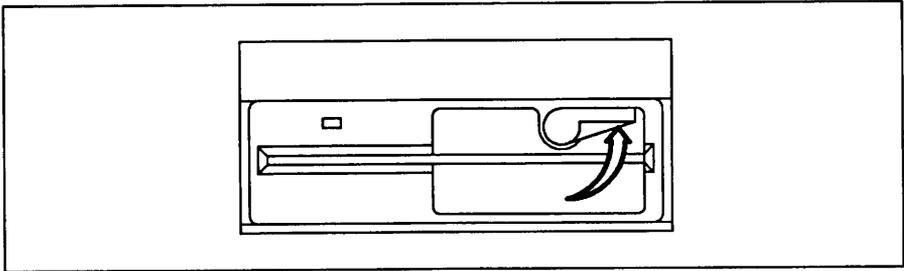


The image shows a terminal window with a title bar that reads "Process _1" and contains two buttons labeled "I" and "S". The terminal content is as follows:

```
-----  
SysV $ /etc/umount f /floppy_directory_name  
-----  
BSD % /etc/umount f /floppy_directory_name  
-----  
Aegis $ dmtvol f /floppy_directory_name
```

- 2 When the prompt reappears, you can remove the diskette from the drive. Turn the diskette drive lever counterclockwise to open the drive, and then remove the diskette.

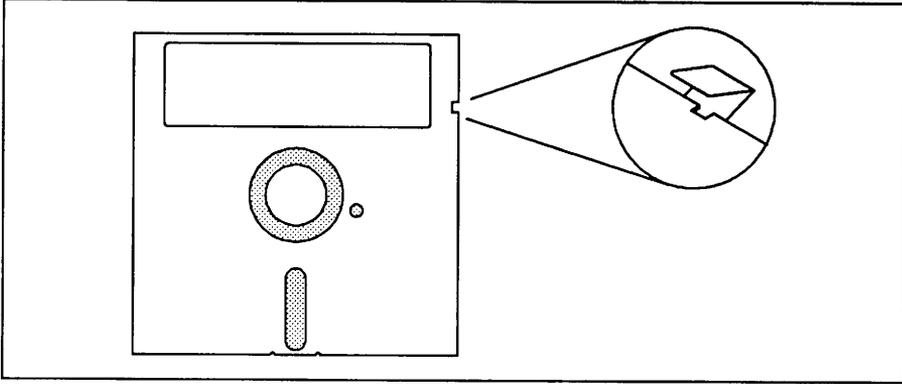
NOTICE: Don't close the drive lever. Always leave the drive open (shown as follows) when you're not using it. The read/write heads may be damaged if the lever is closed on an empty drive.



- 3 Using a soft-tip pen, write the *floppy_directory_name* on the diskette label. To access files stored on this diskette the next time, mount the diskette and set your working directory to */floppy_directory_name*.

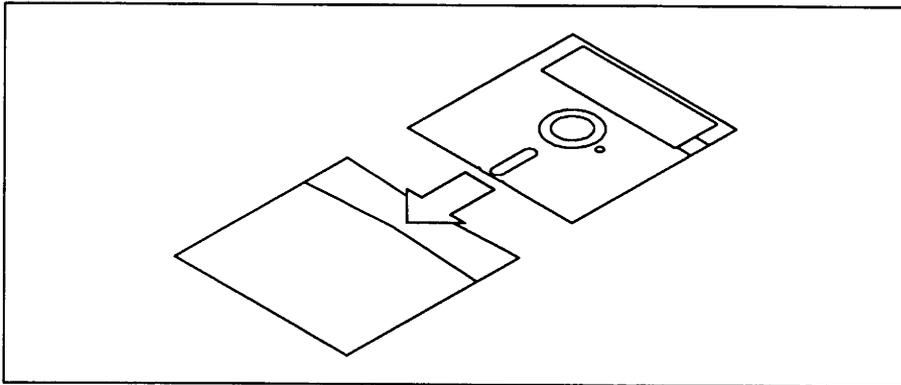
NOTICE: Never use a hard-tip pen or pencil to label a diskette. Doing so can permanently damage the diskette, preventing you from writing to or reading from the diskette.

- 4 If you want to **write-protect** your diskette (protect the files on the diskette from changes or additions), cover the write-enable notch with a **write-protect tab** as shown. Make sure the tab completely covers both sides of the notch.



When the write-enable notch is covered, you *can read* the files stored on the diskette, but you *cannot change* the files on it.

- 5 Store the diskette in its paper envelope.



Chapter 5

Using the Cartridge Tape Drive

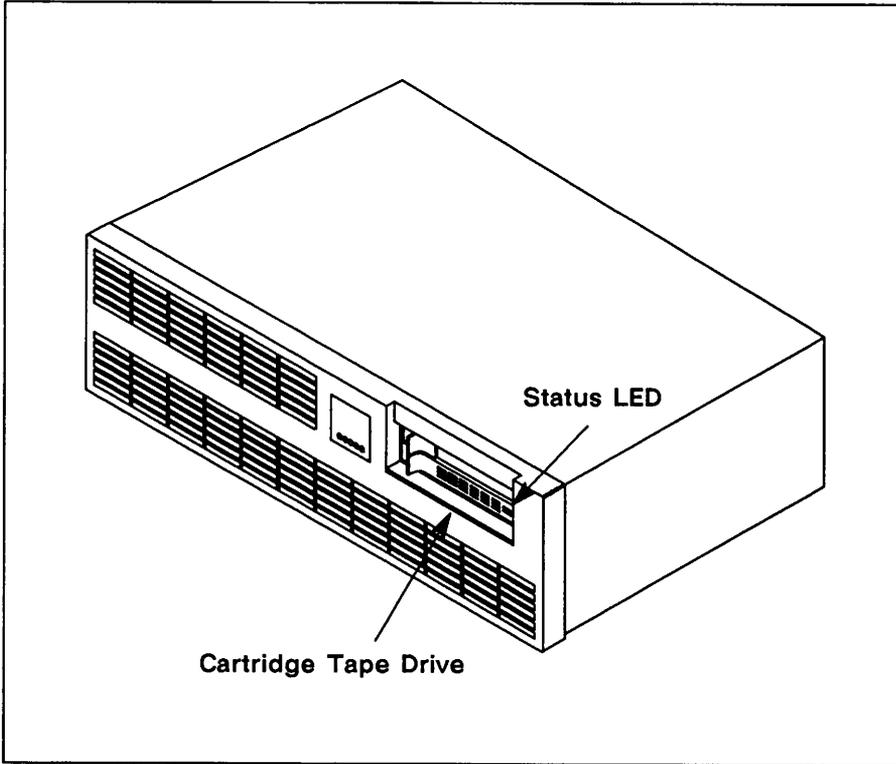
This chapter tells you how to use the optional cartridge tape drive by describing the following:

- Inserting and removing a tape
- Write protecting a tape
- Writing and restoring directories, files, and links
- Performing a Winchester backup
- Running Standalone Utilities (SAUs) from a cartridge tape
- Booting the operating system from a cartridge tape

See Chapter 7 for tape drive cleaning instructions. For instructions on dumping memory to a tape, see Chapter 6. For information about creating and editing descriptor files for the cartridge tape drive, and using streams to perform I/O operations on the tape, refer to the appropriate *Command Reference* manual and the Domain system help files.

The cartridge tape drive is located at the front of the system unit. If a cartridge tape drive is included with your system, a floppy diskette cannot be present. The tape drive holds a 1/4-inch, 45-MB (450-foot) or a 60-MB (600-foot) streaming data cartridge. When you order a system with a cartridge tape option, you also receive one blank tape.

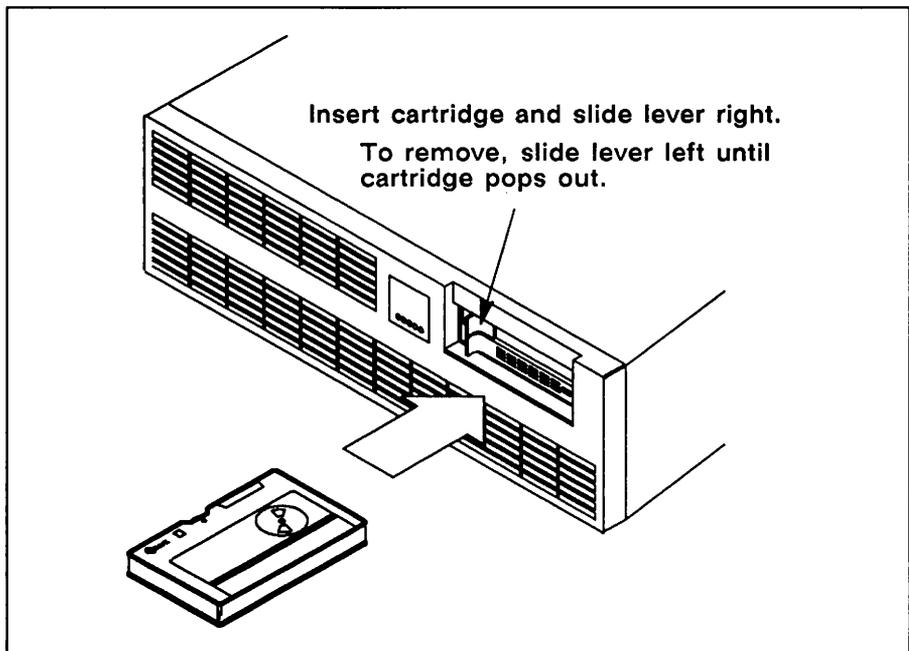
NOTICE: The cartridge tape drive operates with SR9.2.5 or later software.



Inserting and Removing a Tape

The following illustration shows you how to insert and remove the tape cartridge.

NOTICE: Remove the tape cartridge from the drive when it is not in use. The cartridge may be damaged if it remains in the drive for an extended period of time.

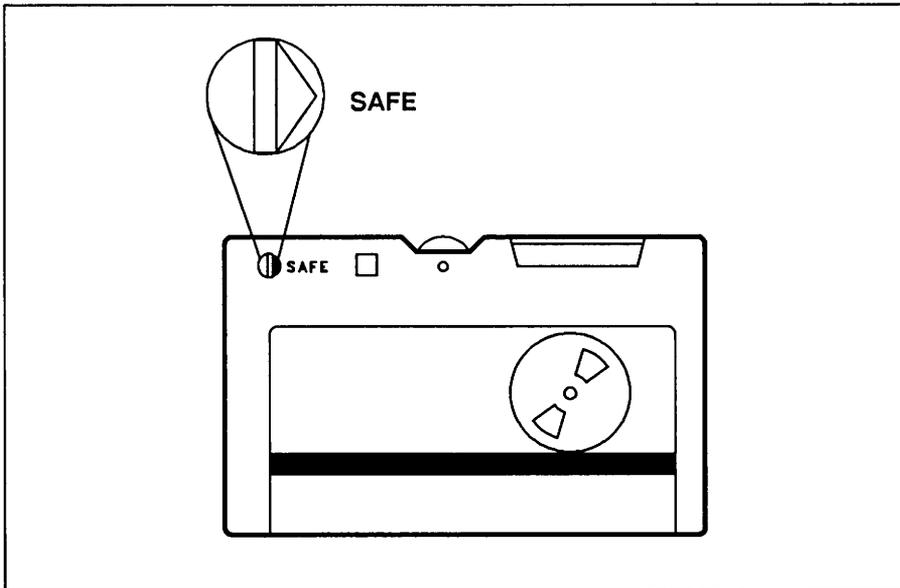


Before using any of the commands in this chapter, insert the tape in the drive and verify that the operating system is running (see Chapter 2 for power-up information).

NOTICE: Never remove a tape from the drive if the LED on the front of the drive is ON, as this indicates that the tape is not positioned at the beginning. If the tape is not positioned at the beginning before you remove it from the drive, you will receive read/write errors when you insert another tape. After performing an operation, make sure that the tape rewinds (see -rewind later in this chapter).

Write Protecting a Tape

You can prevent accidental changes or additions to a tape by **write-protecting** the cartridge. Use a flat-blade screwdriver to set the **write-protect switch** as shown in the following illustration. If the switch points to **SAFE**, the tape is write-protected.

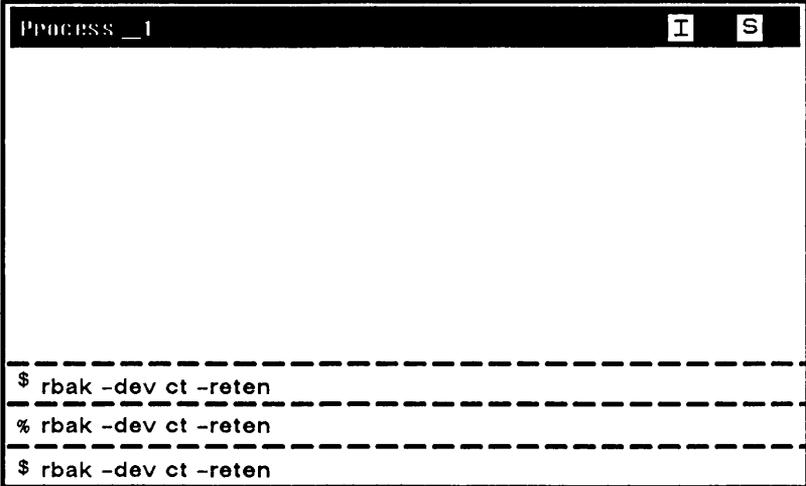


Retensioning a Tape

To ensure accurate read/write operations, retension your tapes periodically. Retensioning restores the proper tape tension on the reel by unwinding the tape to the end and then rewinding it.

Before you use a *new* tape cartridge, retension it by using the **rbak** or **wbak** commands with the **-reten** option. Thereafter, retension the tape after every 6 hours of use, or if you receive read/write errors.

To retension a tape, type the following command next to the prompt:



```
Process _1 [I] [S]
-----
SysV $ rbak -dev ct -reten
BSD  % rbak -dev ct -reten
Aegis $ rbak -dev ct -reten
```

Retensioning takes about 90 seconds. If you still receive errors, you may need to clean the tape drive. See Chapter 7 for cleaning instructions.

Writing and Restoring Directories, Files, and Links

By using the tape drive you can copy objects from a Winchester disk to a tape (**w**rite to the tape) and copy objects from a tape to a Winchester disk (**r**estore from the tape).

NOTICE: Although you cannot directly access the node's tape drive from another device as you can with a node's Winchester disk drive, you can address the tape drive by using the **spm** and **crp** commands. Refer to the appropriate *Command Reference* manual for details.

This section provides a brief summary and some examples of how to write objects to or restore objects from a tape cartridge by using the **wbak** and **rbak** commands.

To read or restore files from another system, use the **read_write_magtape** (**rwmt**) command. The **rwmt** command can read unlabeled tapes, as well as ANSI level 1 through 4 labeled tapes. The tape cartridge must, however, have the QIC-24 format. Refer to the appropriate *Command Reference* manual for further details on reading/restoring non-Apollo formatted files by using **rwmt**.

When performing operations using the tape drive, you commonly use the following options with the **wbak** and **rbak**, commands. The Domain help files and the appropriate *Command Reference* manual contain more detailed information about the commands and options described in the following text.

-dev ct

This option specifies that you want to access the cartridge tape drive. **-dev ct** is an option for **wbak** and **rbak**.

-no_eot

This option prevents the write program from placing an end-of-tape (eot) indication on the tape. Use **no_eot** when you are using multiple invocations of **wbak** to copy objects sequentially onto a tape. You *must* use **no_eot** to prevent the tape from rewinding to the beginning before searching for the next specified file position.

-reten

This option retensions the tape by unwinding it to the end, and then rewinding. The **-reten** command is an option for **wbak** and **rbak**. If you do not specify this option, the tape does not retension.

-rewind

This option rewinds the tape to the beginning. You must use this option to rewind the tape when you perform a read with **rbak**. Otherwise, the tape remains at its current file position and the tape drive LED remains on. If you remove a tape from the drive when the LED is on, you will receive errors when you insert and try to perform operations on another tape. You can rewind a tape by specifying **-rewind** and **-dev ct** as the only options for **rbak**.

-sysboot

This option preserves or skips over the **sysboot** program when it is present on a tape. **Sysboot** is always located at the beginning of a tape if it is present, so you need to use this option only when you are writing data in the first file position (**-f 1**) on a tape. **Sysboot (-sysboot)** is an option of **wbak** and **rbak**.

Writing to a Domain Cartridge Tape

To write directories, files, and links stored on the disk to a cartridge tape, use the **wbak** command. The **wbak** command writes directories, files, and links from a disk to a tape file. The tape file is ANSI standard and does not necessarily correspond to a file on a disk. A tape file holds the contents of an object or many objects as well as the attributes associated with those objects, such as the Unique ID (**uid**) number and Access Control List (**acl**).

The following examples show how to copy objects to a file on a tape by using **wbak** (the pathnames are for illustration purposes only):

```
wbak //comet/data -dev ct -f 1 -fid data_7.1.88 -l
```

This command writes the contents of the directory **//comet/data** to a tape file called **data_7.1.88**. The program writes the file in the first position (the first file on the tape), writes the name **data_7.1.88** as the file ID in the tape file's label, and lists the names of the subdirectories, files, and links on standard output as it copies them to the tape.

NOTICE: The commands shown in the following examples must be entered on one line.

```
wbak //comet/recs -dev ct -f end -af 88/7/1.12.00 -fid new_hires
```

This command writes only the files in the directory **//comet/recs** added or modified since noon on 7/1/88. The program positions the tape file at the end of the file set on the tape and writes the name **new_hires** in the tape file's label.

```
wbak -dev ct -f cur -own fred -fid latest_problems/[a-f]?*bug
```

This command uses wildcards to match only those files in the **latest_problems** subdirectory of the current working directory whose names begin with the letters **a** through **f** and end with **bug**. The command also writes the name **latest_problems** as the file ID and the name **fred** as the owner ID in the file's label. For more information about wildcards, see the appropriate *Command Reference* manual.

```
wbak //comet/new_specs -dev ct -f 1 -sysboot -fid new_specs
```

This command line adds a file to a tape that contains the **sysboot** program, but does not write over **sysboot**.

To create multiple tape files (using successive invocations of **wbak**), use the **-no_eot** option in all the command lines except the last. In addition, use the **-f** option with the starting tape file position in the first command line, and **-f cur** or **-f** with the next tape file position in all subsequent command lines. (You can also use **-reo** to reopen the tape at the current position.)

NOTICE: You *must* use **no_eot** to prevent the tape from rewinding to the beginning before searching for the next specified file position.

For example, the following command lines write several directories to multiple tape files from a Winchester disk:

```
wbak //comet/minutes -dev ct -f 1 -no_eot -fid comet_status
```

```
wbak //comet/design_specs dev ct -f 2 -no_eot -fid specs
```

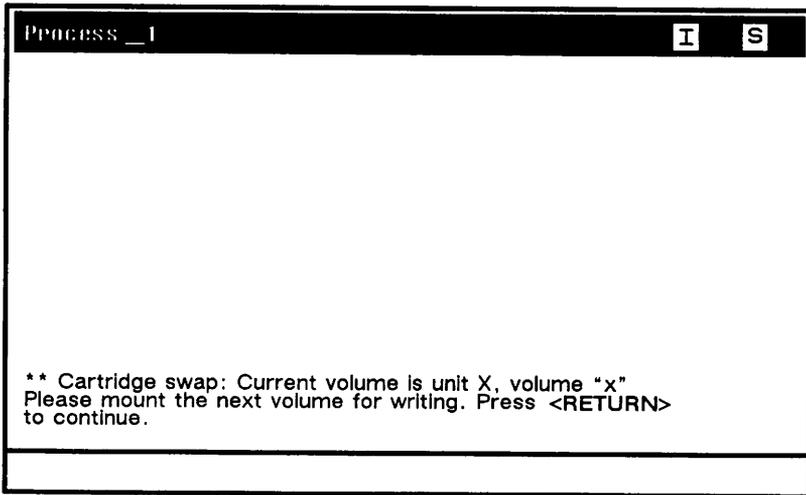
```
wbak //comet/schedule -dev ct -f cur -no_eot -fid schedule
```

```
.  
. .  
.
```

```
wbak //comet/documentation -dev ct -f cur -fid doc
```

When you use the **-no_eot** option, do not use the **-f end** option. Since **-no_eot** directs **wbak** not to put a double tape mark at the end of a tape file, there are no "end" marks on the tape. If you do *not* use the **-no_eot** option, **wbak** puts a double tape mark at the end of each tape file. Then, when you copy an object to the *next* file position by using **wbak**, the tape rewinds to the beginning, searches forward to the double mark, and then continues writing. Using **-no_eot** greatly speeds up writing multiple objects to the tape.

If the objects fill up the tape, your monitor displays the following:



Remove the cartridge from the drive and insert another cartridge. Then press the `<RETURN>` key.

To read the help file on `wbak`, type `help wbak` next to the Aegis prompt or `man wbak` next to the BSD or SysV prompt.

Restoring Objects to a Disk

Use the `rbak` command to restore objects written to the cartridge tape drive with `wbak`. The `rbak` command restores a tape file to a disk, retaining all the objects in the tape file, such as the Unique ID (`uid`) number and Access Control List (`acl`). A tape file is ANSI standard and does not necessarily correspond to a disk file.

You can also display the names of the tape files on your monitor without restoring any information to the disk by using the `-index` option to `rbak`.

The following examples show how to restore objects on a tape file by using **rbak**:

```
rbak -dev ct -f 1 -index -all -rewind
```

This command lists the contents of the tape file at the first position without restoring any information to the disk. (If you do not specify a file position, **rbak** prompts you to enter it.) After listing all the objects in the first position, **rbak** rewinds the tape to the beginning.

```
rbak -dev ct -f 5 -int ann/bill -as //gold/sue/joe
```

This command restores the tape file **ann/bill** in position **5** to the directory **sue/joe** on node **//gold**.

```
rbak -dev ct -f 1 -all -l -rewind
```

This command restores all the objects on the tape to the disk, and lists the objects on standard output as the program copies them. It then rewinds the tape to the beginning.

To read the help file on **rbak**, type **help rbak** next to the Aegis prompt or **man rbak** next to the BSD or SysV prompt.

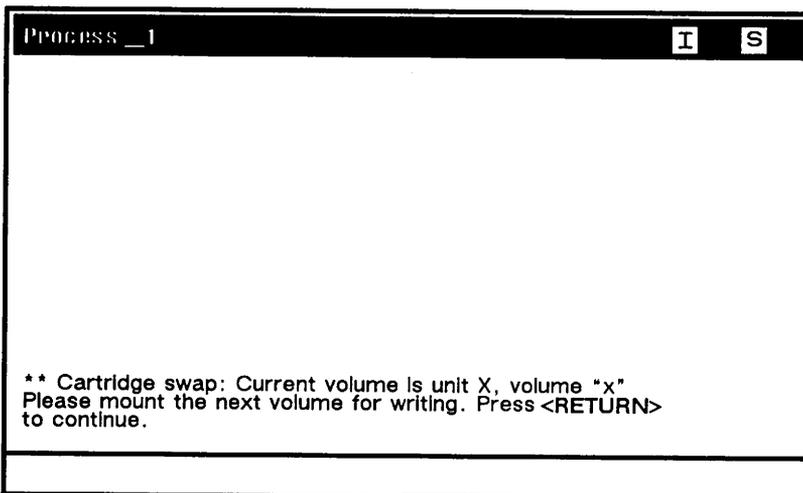
Performing a Winchester Backup

You can back up a Winchester disk on a tape cartridge by using the `wbak` command with the `-dev ct` option. Use `wbak` to do the following:

- Copy all directories, files, and links in the specified object to the tape.
- Copy only objects modified since the last backup.
- Copy all objects that were modified either before or after a specified date.

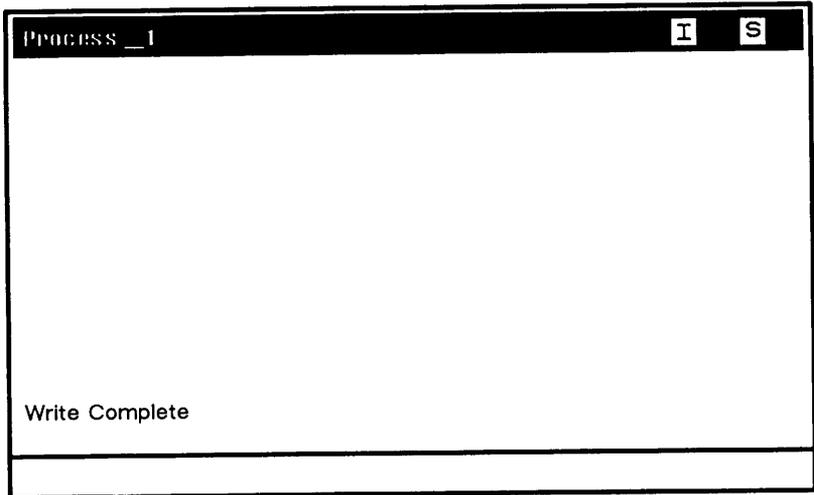
You can back up the contents of the entire Winchester disk by specifying the entry directory name as the target pathname in the command line.

You may need more than one cartridge to hold the data. If this is true, your monitor displays the following:



To continue copying data, remove the tape from the drive and insert another one. Make sure the new tape is *not* write-protected (see "Write Protecting a Tape"). Then press the <RETURN> key.

The backup is complete when the monitor displays the following message:



and the prompt returns.

The following examples show how to perform Winchester backups:

```
wbak -dev ct -f 1 -own "roy" -vid "vol2" -fid node_35 //pal
```

This command backs up the entire contents of the node whose entry directory name is //pal. Note that the file ID, owner ID, and volume ID are specified to make the tape file easy to identify when you reload it.

wbak -dev ct//pal/new -f end -af 88/7/5.12.00 -fid pal_bk_7.8.88

This command copies only objects modified since the last backup (in this case, July 5, 1988). The **wbak** command stores the objects on a tape file named **pal_bk_7.8.88**.

wbak -dev ct//pal/office/recs -f end -af 88/7/1.12.00 -fid q3_88

This command copies all files in the directory **//pal/office/recs** modified after July 1, 1988, to a tape file named **q3_88**.

Running Standalone Utilities from a Cartridge Tape

You can run any of the Standalone Utilities (SAUs) stored on a cartridge tape by using the Mnemonic Debugger's `di` command followed by the "c" argument, and then using the `ex` command. SAU programs run from the MD, the low-level program resident in the system's PROMs (see Chapter 2). The cartridge tape used to run the SAU programs must have the `sysboot` program written to it, and the `/sau` directory should be written to tape by using the `wbak` command.

For example, to run the `salvol` program on the Winchester disk from the tape, obtain a tape cartridge that contains the SR9.2.6 or later software release `/sau8` directory for DS3000, the SR9.6 `/sau7` for DS4000, the SR9.7.1 `/sau7` for DS3500, or the SR10.1 `/sau7` for DS4500.

Insert the cartridge into the tape drive. Shut down the operating system and reset the MD (See Chapter 2). Use the following commands to load and begin executing the `salvol` program:

```
> di c
```

```
> ex salvol
```

When the program completes, reset the MD.

To copy the `sysboot` program and `/sau` directory to a cartridge tape, use the following commands in a shell:

```
cpboot /sys -dev ct
```

```
wbak /sau8 -dev ct -f 1 -sysboot
```

Booting the Operating System from a Cartridge Tape

If the Winchester disk is not functioning properly or its data is damaged, you can load and begin executing (boot) the operating system by using a cartridge tape. To use the tape drive as a boot device, obtain a cartridge that contains the boot software for your system (SR9.2.6 for DS3000; SR9.5 for DS3010; SR9.6 for DS4000; SR9.7.1 for DS3500/3550; SR10.1 for DS4500). If your system has a cartridge tape drive, you also receive a booting software cartridge. The following procedure describes how to boot the operating system from a cartridge tape:

- 1 Insert the cartridge into the tape drive.
- 2 Set the node for Service operation and shut down the operating system (see Chapter 2).
- 3 At the MD's prompt (>), type:

 > re

 > <RETURN>

The monitor now displays the MD banner:

```
md revision n.n release n.n y/m/d
```

If you do not see this banner, press <RETURN> several times.

- 7 When you see the) prompt, load the Display Manager software by typing:

go <RETURN>

After a few seconds, the monitor displays the Apollo logo, and then the log-in prompt. The system has now loaded the operating system from the tape to the disk.

- 8 If you receive an error message while the booting program is running, and you return to the) prompt, type **rbak** to restart the booting program.





Chapter 6

Recovering from a System Crash

This chapter tells you how to recover from a system failure by describing the following:

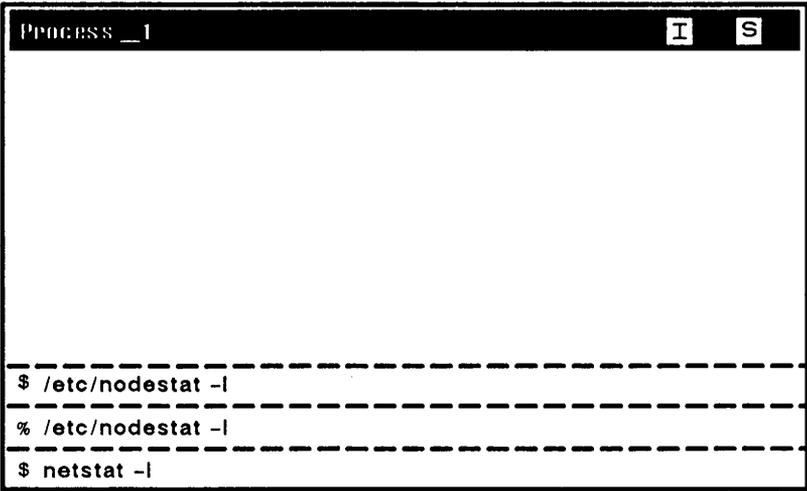
- Handling a system hang
- Handling a system crash
- Dumping memory

Handling a System Hang

A system hang is caused by a hardware, software, or network failure. If a system hangs, it suddenly stops responding to keyboard input and the cursor stops flashing or disappears. This section describes several steps you can take to correct system hangs.

NOTICE: Use this procedure only if your system was running the operating system when the hang occurred. If a hang occurs while you're starting up or running the Mnemonic Debugger (MD), contact your service representative.

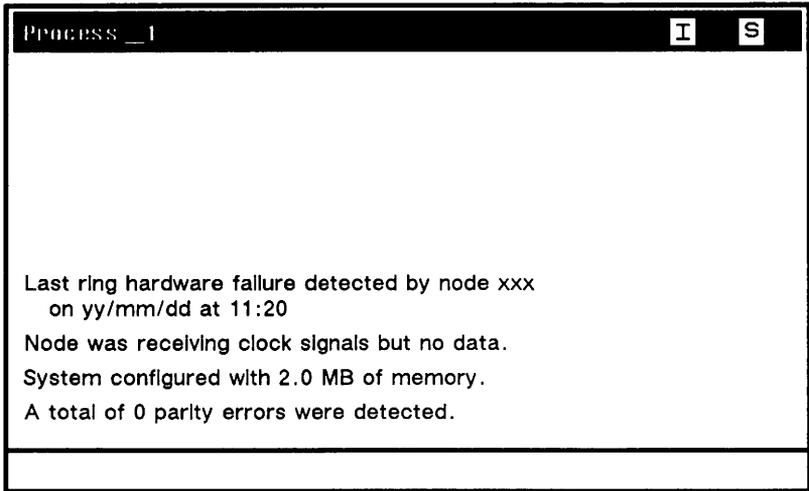
- 1 If the cursor disappears while you're executing a program, the program may have hung. Type `<CTRL>/q` to quit the program. If your system still isn't working properly, go to Step 2.
- 2 If the problem continues, go to another node in your network and type the following command:



The image shows a terminal window titled "Process _1" with window control buttons "I" and "S". Below the window, three rows of commands are shown, each preceded by a label and separated from the window by a dashed line:

```
SysV $ /etc/nodestat -l
BSD % /etc/nodestat -l
Aegis $ netstat -l
```

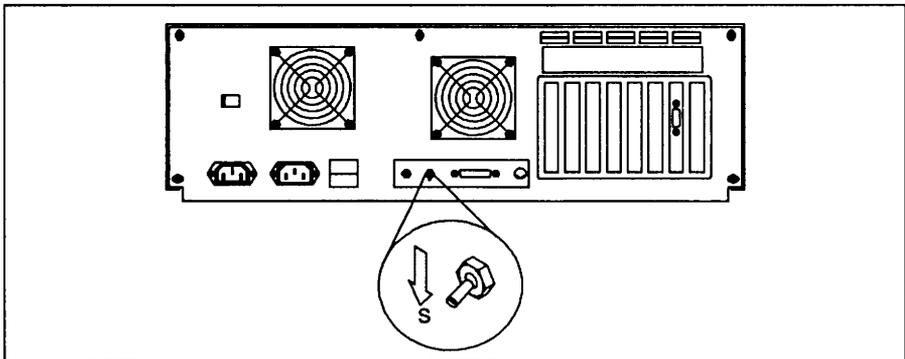
The screen now displays statistics about network communications. The first lines contain the date and time of the last recorded network failure. The following screen shows a typical network reading.



- 3 If the last ring hardware failure was recent, your network may be the cause of the system hang. Report the possible network problem to your system administrator.

If the problem isn't your network, or no ring hardware problems are listed, go to Step 4.

- 4 Go back to your system and set the Normal/Service switch (SW2) to Service.



- 5 Now press <CTRL>/<RETURN>.
- 6 Check to see if your screen displays a `crash_status` message similar to the following:

```
CRASH_STATUS 000B0008 ECB nnnnnn PID nnnnnn
S          E2F320          2700
E2F320:   4E4F
>
```

The `crash_status` message shows that you've stopped the operating system and given control to the Mnemonic Debugger (MD).

NOTICE: If the `crash_status` message appears, go to Step 7. If it doesn't, go to Step 9.

- 7 Record in the system logbook the program that you were running when the hang occurred. Also note that you were able to give control to the MD by pressing <CTRL>/<RETURN>.

- 8 Restart the operating system by typing:

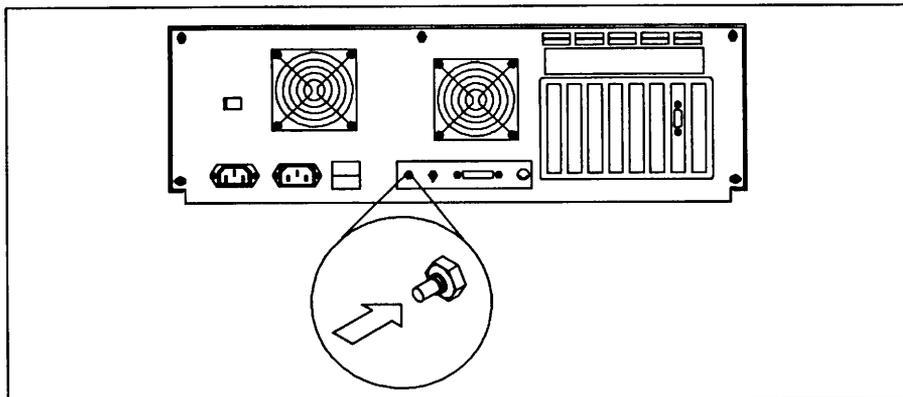
```
> g <RETURN>
S          E2F320          2700
E2F320:   4E4F

> g *+2 <RETURN>
<CTRL>/f
```

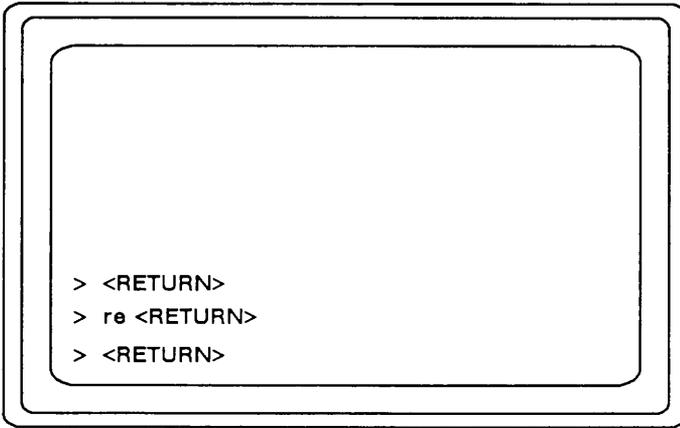
Wait about 20 seconds. If your display resets and the flashing cursor appears, the node hang is fixed and you can continue normal operation. Set the Normal/Service switch (SW2) to Normal (up) and resume processing.

NOTICE: Follow the instructions in Steps 9 through 12 only if the `crash_status` message shown in Step 7 *didn't* appear.

- 9 Because the `crash_status` message didn't appear, you should now manually reset your system. To do this, press the Reset button (SW1).



10 When you see the > prompt, type:

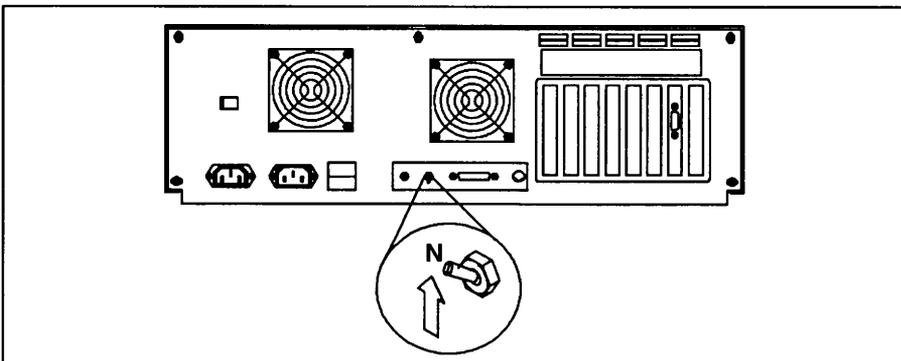


11 Record in the logbook the program that you were using when the system hung. Also note that you had to use the Reset button (SW1) to give control to the MD.

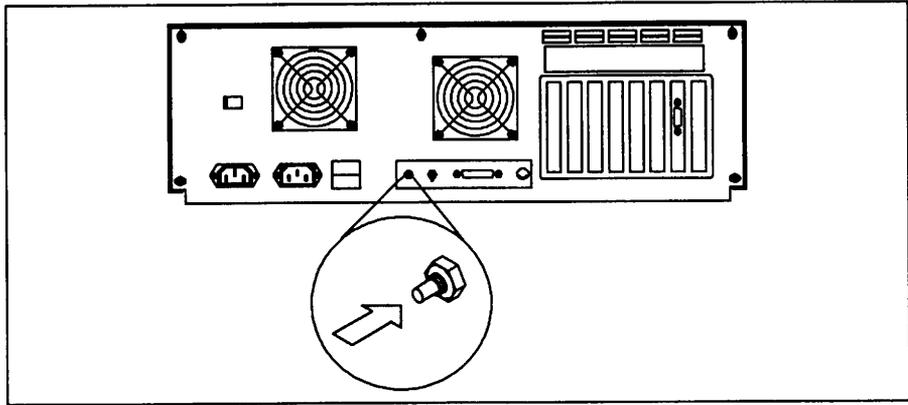
12 Report the hang to your service representative. If your service representative asks you to perform a memory dump, go to the “Dumping Memory” section later in this chapter.

If not, go to Step 13.

13 To restart the operating system, set the Normal/Service switch (SW2) to Normal.



- 14 Press the Reset button (SW1).



- 15 The system now runs diagnostics. If the workstation boots from a storage device, and it needs salvaging, the system automatically executes the **salvol** program and displays the message "SALVAGING BOOT VOLUME." When **salvol** completes the operating system boots.
- 16 Log in when the log-in prompt appears. Your system has now recovered from the system hang.

Handling a System Crash

A crash is an unexpected exit from the operating system to the Mnemonic Debugger (MD) program. When a system crashes, all processes stop and a crash message appears at the bottom of your screen. The crash message is followed by the MD prompt as shown in the following screen.

```
CRASH_STATUS nn ECB nnn PID nnn
S      E2F320      2700
E2F320: 4E4F
>
```

After a crash, the operating system boots when certain conditions are met at the time of the crash. These conditions are

- The Normal/Service switch was set to Normal (up).
- System initialization completed.
- A full disk didn't cause the crash.

When a diskless system automatically reboots, your screen displays the message "SALVAGING BOOT VOLUME" right after the crash message. If the system is diskless, the message: "LOW:nnnnnn HIGH:nnnnnn START:nnnnnn" appears after the crash message. Then the system begins loading the operating system from its own disk or its partner node.

When you see the log-in prompt, log in and continue normal operations.

NOTICE: When the system automatically reboots, it *does not* perform a memory dump; it *does* record the error in its `sys_error_log`.

Because many different problems can cause crashes, we can't list all of the possibilities. However, the following three items describe common causes and tell you what to do if your system crashes and *doesn't* automatically reboot.

- 1 Record the crash message in the logbook. Check the logbook to see if the system has crashed before with the same status code.

If your screen did not display a `crash_status` code, go to Step 5.

- 2 If the same status code has appeared before, this may indicate a hardware problem. Report this to your service representative, then go to Step 5.

If the status code has not appeared before, go to Step 3.

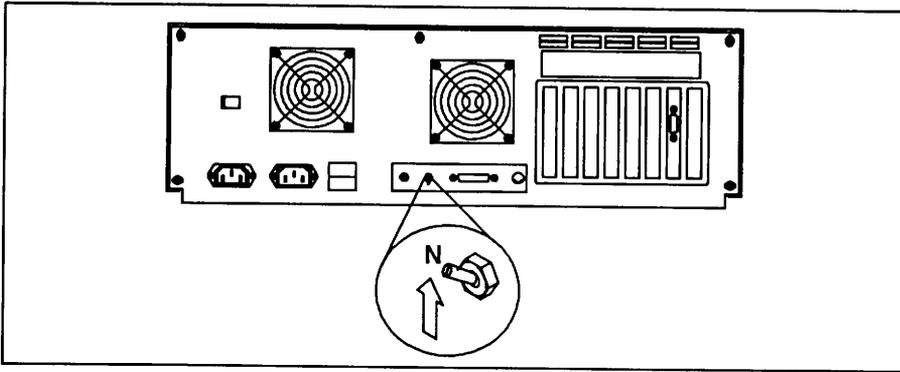
- 3 Check the table on the next page to see if it lists your `crash_status` code. If it does, follow the instructions in the solution column.

Record the meaning of the status code in the logbook, and go to Step 5.

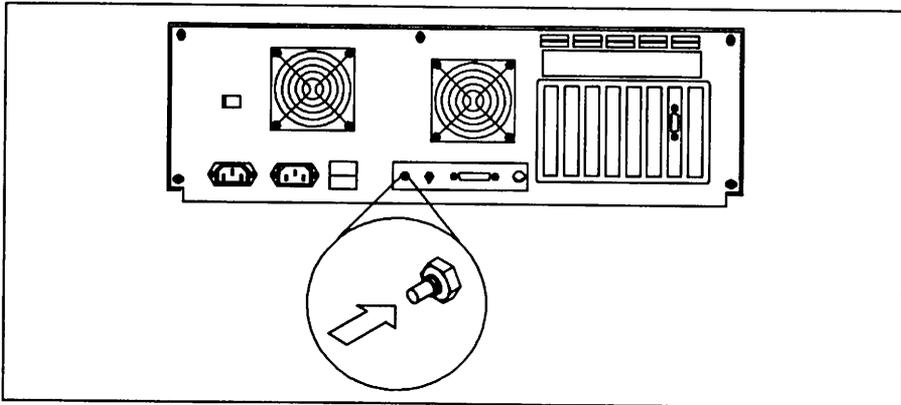
If your `crash_status` code *is not* listed in the table, go to Step 4.

Status Code	Meaning	Solution
000B0008	You typed <CTRL>/<RETURN> when your node was in Service mode or an SIO port received a 1B (hex) character.	<ol style="list-style-type: none"> 1. Enter the following commands: <ul style="list-style-type: none"> > g <RETURN> > g *+2 <RETURN> 2. Enter <CTRL>/f to reset your screen. 3. Make sure the Normal/Service switch is in the Normal (up) position. 4. Resume normal operation.
0008001B	The door of the diskette drive opened or a storage module stopped.	If you're using a diskette, close the drive door. Then, go to Step 5.
0008...	Your node may have a disk problem.	Report the problem to your service representative.
0012000F	Your node may have a memory hardware problem.	Report the problem to your service representative.

- 6 To restart the operating system, set the Normal/Service switch (SW2) to Normal.



- 7 Press the Reset button (SW1).



- 8 The system now runs diagnostics. If the workstation boots from a storage device and it needs salvaging, the system automatically executes the **salvol** program and displays the message "SALVAGING BOOT VOLUME." When **salvol** completes, the operating system is booted.
- 9 Log in when the log-in prompt appears. Your system has now recovered from the crash.

Dumping Memory

A memory dump makes a copy of the system memory contents at a particular time. Memory dumps are especially useful for analyzing the cause of a hang or crash. This section describes two memory dump procedures:

- **Dumping Memory to a Diskette or Cartridge Tape** — Use this procedure if you have a diskette drive or a cartridge tape drive.
- **Dumping Memory Across the Network** — Use this procedure if you do not have a diskette drive or a cartridge tape drive. This procedure takes slightly longer than dumping to the diskette or cartridge tape because it's a two-step process. First, dump the system memory contents to another node in your network (the dump storage node). Then, copy the memory dump to the dump storage node's diskette or tape.

NOTICE: Only perform a memory dump if your service representative requests it.

Dumping Memory to a Diskette or Cartridge Tape

This section describes how to dump the system memory contents to the floppy diskette or cartridge tape drive.

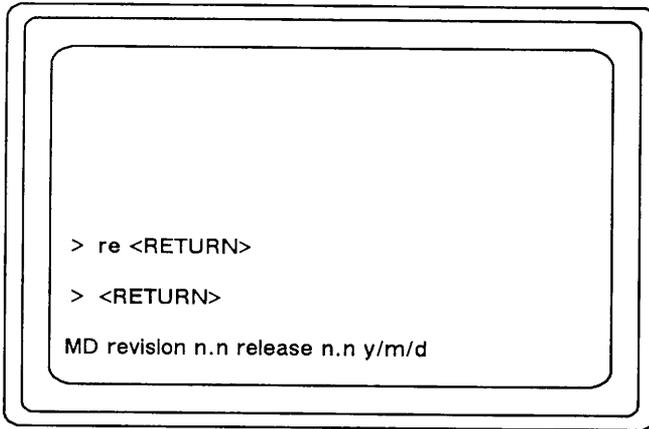
Before beginning this procedure, make sure

- The Normal/Service switch (SW2) is set to Service (down).
- The system is under the control of the MD (your screen displays the > prompt).
- You have two to four initialized floppy diskettes (depending on memory size) or one cartridge tape.

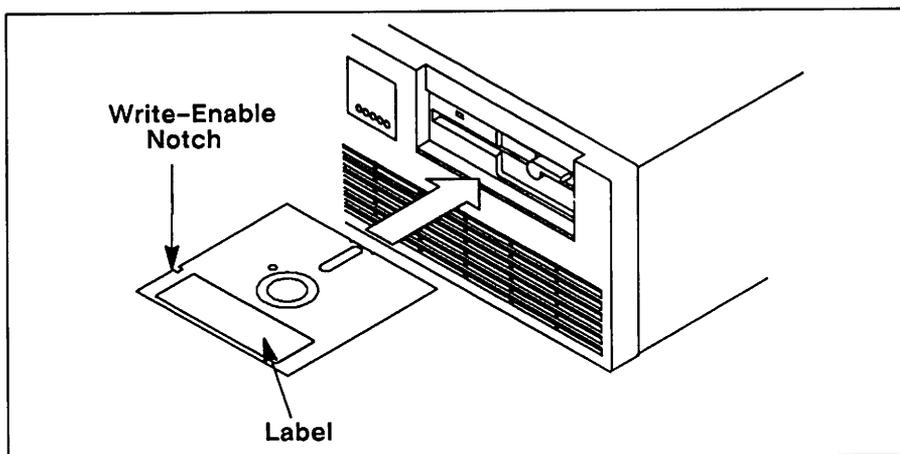
NOTICE: If your diskettes need to be initialized, refer to the "Inserting, Initializing, and Mounting Diskettes" section in Chapter 4 for instructions.

If you're dumping memory from a server, refer to the "Connecting a Terminal or Domain Node " section in Chapter 3 for instructions on how to hook up your server to a node with a display.

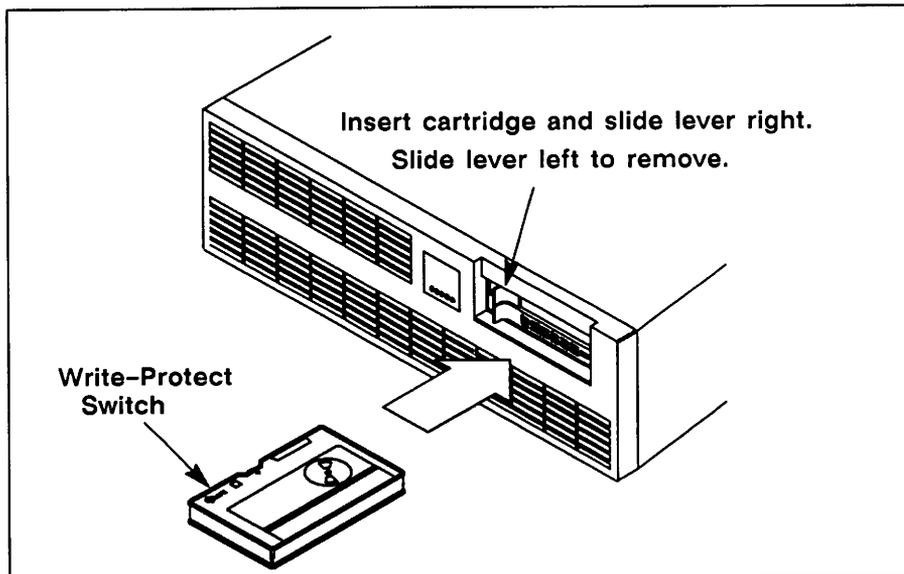
- 1 Reset the MD as shown on the following screen. The system now displays the revision date of the CPU PROM.



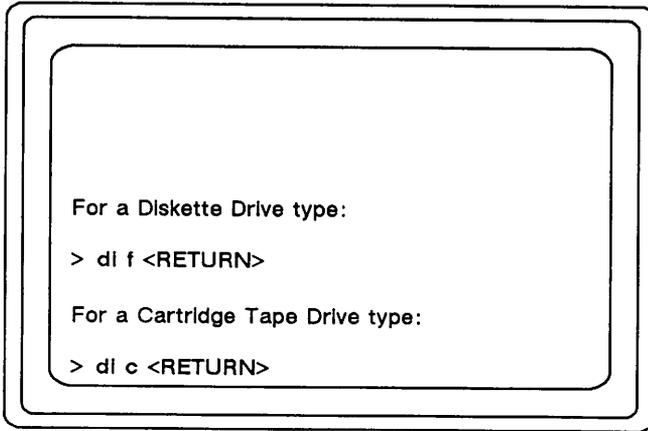
- 2 If your system has a diskette drive, insert an initialized write-enabled diskette into the drive.



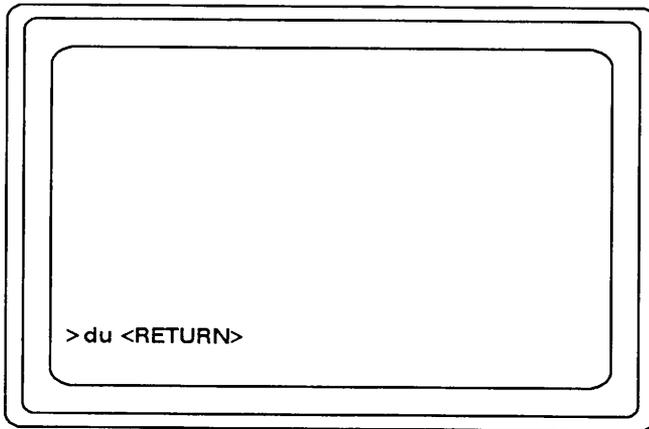
- 3 If your system has a cartridge tape drive, insert a write-enabled cartridge into the drive.



- 4 Type the following to direct the memory dump to the diskette:



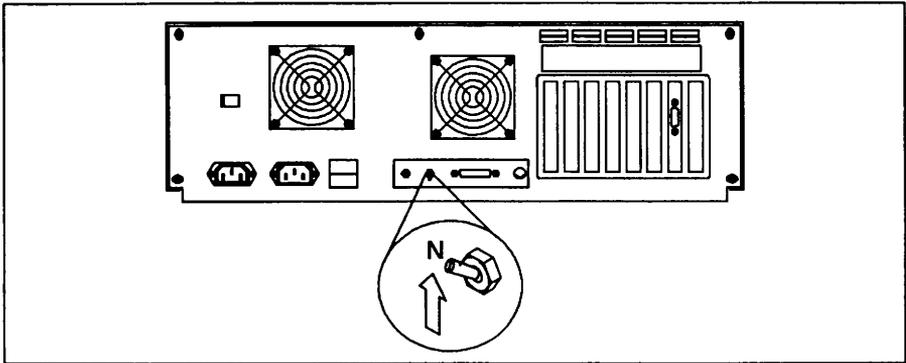
- 5 Start the memory dump by typing:



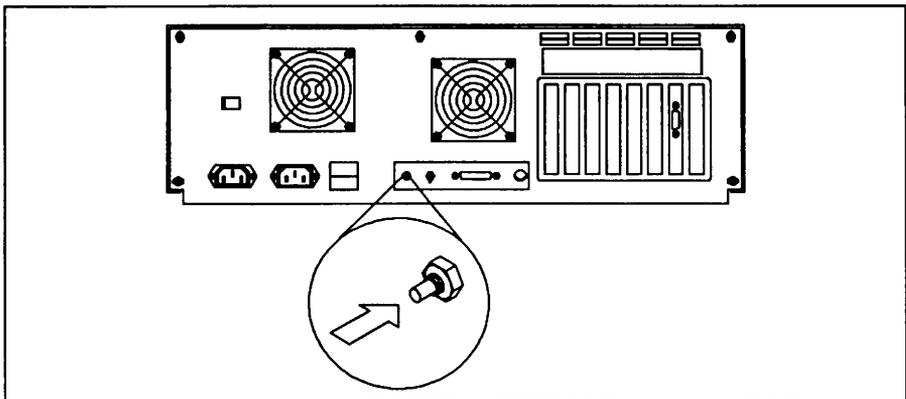
Your system now displays a count of the pages dumped. Each ! represents 32 pages of memory.

NOTICE: If your system hangs during the dump, press the Reset button (SW1) and go back to Step 1.

- When the memory dump has filled your diskette, the screen prompts you to remove it from the drive and insert another one. When the word *done* appears at the bottom of your screen, the memory dump is complete. Remove the diskette or cartridge tape from the drive and label the diskettes or tape that contains the dump.
- To restart the operating system, set the Normal/Service switch (SW2) to Normal.



- Press the Reset button (SW1).



- The system now runs diagnostics. If the workstation boots from a storage device and it needs salvaging, the system automatically executes the salvol program and displays the message "SALVAGING BOOT VOLUME." When salvol completes, the operating system is booted.

- 10 When the log-in prompt appears, log in and set your working directory to `/sau8` for a DS3000 or `/sau7` for a DS3500/4000/4500.

```
Process _1 I S
-----
SysV $ cd /sau8 (DS3000) (cd /sau7 for DS3500/4000/4500)
BSD  % cd /sau8 (DS3000) (cd /sau7 for DS3500/4000/4500)
Aegis $ wd /sau8 (DS3000) (wd /sau7 for DS3500/4000/4500)
```

- 11 Insert a diskette or cartridge tape into the drive and copy the `/sau8/domain_os.map` for a DS3000 or `/sau7/domain_os.map` for a DS3500/4000/4500 file by typing one of the following commands.

For a floppy diskette drive, type the following:

```
Process _1 I S
-----
SysV $ wbak domain_os.map -f 1 -dev f -l
BSD  % wbak domain_os.map -f 1 -dev f -l
Aegis $ wbak domain_os.map -f 1 -dev f -l
```

For a cartridge tape drive, type the following:

```
Process _1 I S
-----
SysV $ wbak domain_os.map -f 1 -dev ct -l
BSD  % wbak domain_os.map -f 1 -dev ct -l
Aegis $ wbak domain_os.map -f 1 -dev ct -l
```

- 12 As **wbak** proceeds, your screen displays several messages similar to the following:

```
Process _1 I S
Label:
Volume ID: (no id specified)
Owner ID: (no owner specified)
File number: 1
File section: 1
File ID: (no id specified)
File written: yy/mm/dd 11:25:30 (EDT)
Starting write:
(file) /sauX/domain_os.map written
Write complete.
```

- 13 When **wbak** completes, remove the diskette or cartridge tape from the drive and label it: **/sau8/domain_os.map**, **system_node_id**, **date** for a DS3000 or **/sau7/...** for a DS3000/3500/4500.

Dumping Memory Across the Network

This section describes how to send a memory dump across the network and store it on another node's (the **dump storage node**) Winchester disk. After storing the dump on the Winchester disk, you then copy it to the diskette or tape drive on the dump storage node.

Before beginning this procedure, make sure that

- The Normal/Service switch is set to Service (down).
- The system is under the control of the MD (your screen displays the > prompt).
- The dump storage node has a diskette or tape drive.
- The dump storage node is running SR9.5 or a later software release. (Use the **blt** shell command to determine the current software release.)
- The dump storage node is running the **netman** process. (Use one of the following commands to see if **netman** is running. See your system administrator or the appropriate *Managing System Software* manual for more **netman** information.)

	PROCESS _1	I	S
SysV	ps -e -n //dump_storage_node		
BSD	% ps -ax -n //dump_storage_node		
Aegis	\$ pst //dump_storage_node		

- You know the node ID of the dump storage node. To find it, type one of the following commands on the dump storage node:

	Process _1	I	S
SysV	----- \$ /etc/lcnode -me -----		
BSD	% /etc/lcnode -me -----		
Aegis	\$ lcnode -me -----		

- The dump storage node has enough free space on its Winchester disk. To verify this, type on of the following commands on the dump storage node:

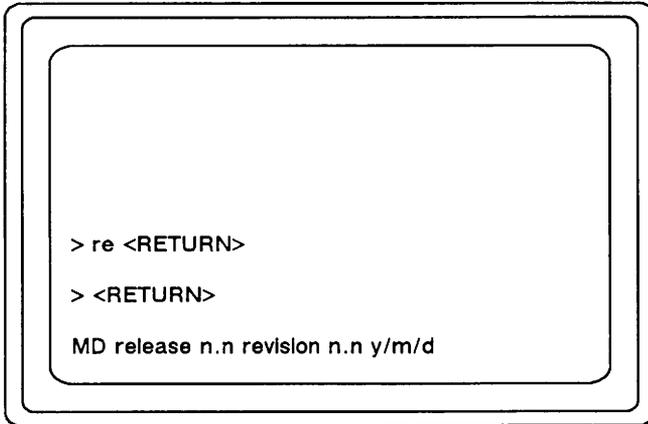
	Process _1	I	S
SysV	----- \$ df -t / -----		
BSD	% df / -----		
Aegis	\$ lvolfs -----		

If your system has 2 MB of memory, the dump storage node must have about 2000 free blocks on its Winchester disk. If your system has 4 MB of memory, the dump storage node must have about 4000 free blocks, and so forth.

If the storage node you've chosen doesn't have enough free space, either create more free space on its disk or choose another node.

NOTICE: If you're dumping memory from a server, refer to the "Connecting a Terminal or Domain Node" section in Chapter 3 for instructions on how to hook up your server to a node with a display.

- 1 Reset the MD as shown. The system displays the revision date of the CPU PROM as follows:



```
> re <RETURN>
> <RETURN>
MD release n.n revision n.n y/m/d
```

- 2 Type the following to direct the memory dump across the network.

```
> dl n nnnnnn <RETURN>
```

Replace *nnnnn* with the dump storage node ID.

- 3 Start the memory dump by typing:

```
> du <RETURN>
Dump File: dump_file_pathname
!!!!!!!!!!!!!!!!!!!!
```

Your system now displays the name of the dump file and a count of the pages dumped. Each ! represents 32 pages of memory.

Record the *dump_file_pathname* because you'll need it in Step 4.

The memory dump is complete when the word **done** appears.

For a cartridge tape drive, type:

```
PROCESS _1 I S
-----
SysV $ wbak dump_file_pathname -f 1 -dev ct
-----
BSD  % wbak dump_file_pathname -f 1 -dev ct
-----
Aegis $ wbak dump_file_pathname -f 1 -dev ct
```

- 5 As **wbak** proceeds, your screen displays several messages similar to the following:

```
PROCESS _1 I S

Volume ID:          300_1
Owner ID:           (no owner specified)
File number:        1
File section:       1
File ID:            (no id specified)
File written:       yy/mm/dd 11:30:30 (EDT)

Starting write:

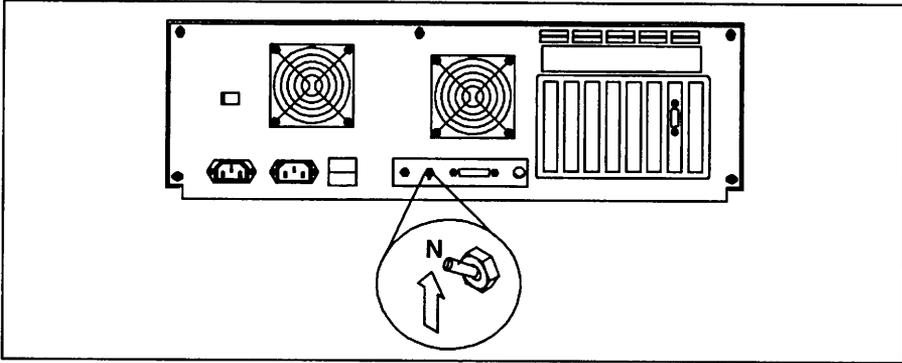
** Floppy swap: unit 0, volume "300_1"
Please mount the next volume for writing.
Press <return> to continue.

** The new volume id is "300_2".

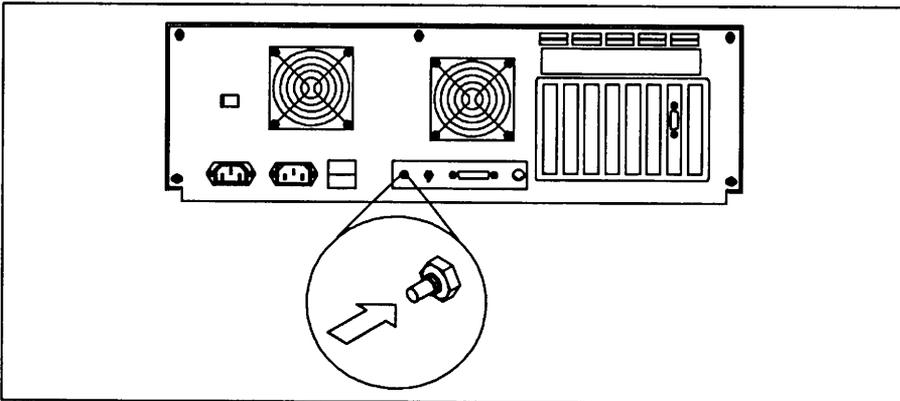
(file) "dump.27fe.01.31" written.

Write complete.
```

- When `wbak` completes, remove the diskette or tape from the drive and label it: `/sau8/domain_os.map, system_node_id, date` for a DS3000 or label it `/sau7/...` for a DS3500/4000/4500.
- To restart the operating system, set the Normal/Service switch (SW2) to Normal.



- Press the Reset button (SW1).

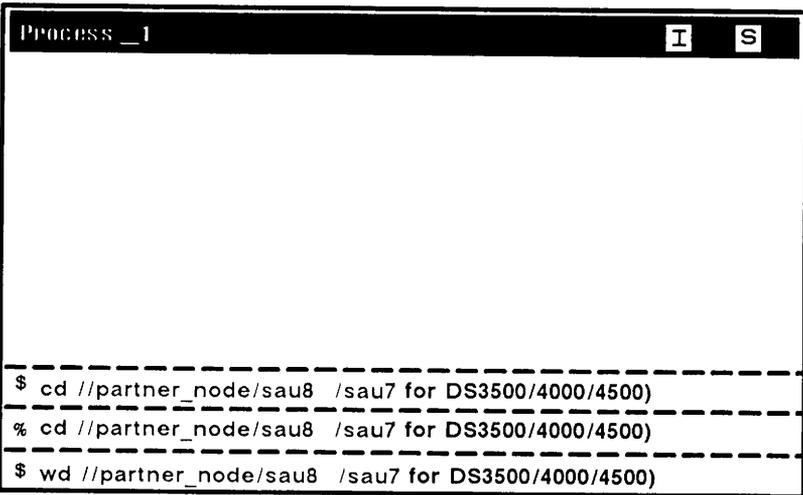


- The system now runs diagnostics. If the workstation boots from a storage device and it needs salvaging, the system automatically executes the `salvol` program and displays the message "SALVAGING BOOT VOLUME." When `salvol` completes, the operating system is booted.

- 10 When the log-in prompt appears, go to a node in your network that contains a floppy diskette or cartridge tape drive. Insert an initialized write-enabled diskette or tape into its drive.
- 11 If your system (referred to as “//problem_node”) has a *Winchester disk*, set your working directory as follows:

	Process _1
SysV	\$ cd //problem_node/sau8 (/sau7 for DS3500/4000/4500)
BSD	% cd //problem_node/sau8 (/sau7 for DS3500/4000/4500)
Aegis	\$ wd //problem_node/sau8 (/sau7 for DS3500/4000/4500)

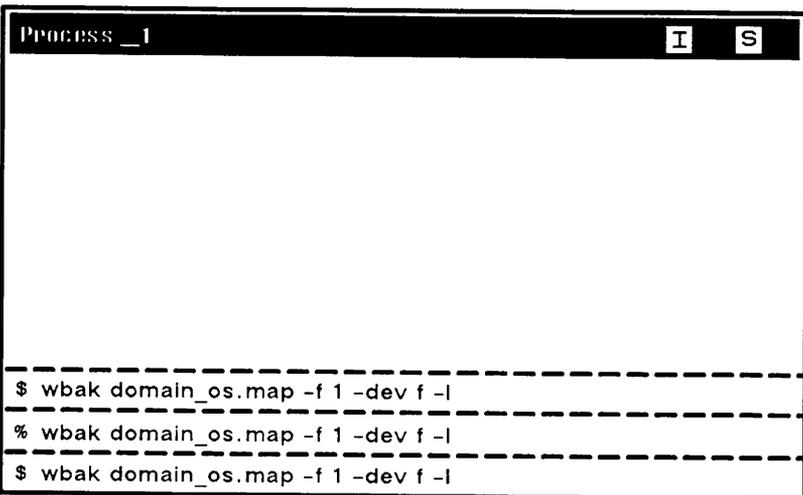
If your system *doesn't* have a *Winchester disk*, set your working directory as shown in the following illustration (where `//partner_node` is the name of your node's partner).



```
Process _1 [I] [S]
-----
SysV $ cd //partner_node/sau8 /sau7 for DS3500/4000/4500)
BSD  % cd //partner_node/sau8 /sau7 for DS3500/4000/4500)
Aegis $ wd //partner_node/sau8 /sau7 for DS3500/4000/4500)
```

12 Copy the `domain_os.map` file onto the diskette or tape.

For a *diskette drive*, type the following command:

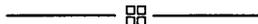


```
Process _1 [I] [S]
-----
SysV $ wbak domain_os.map -f 1 -dev f -l
BSD  % wbak domain_os.map -f 1 -dev f -l
Aegis $ wbak domain_os.map -f 1 -dev f -l
```

- 13 For a *cartridge tape drive*, type the following command:

```
Process_1 I S
-----
SysV $ wbak domain_os.map -f 1 -dev ct -l
-----
BSD  % wbak domain_os.map -f 1 -dev ct -l
-----
Aegis $ wbak domain_os.map -f 1 -dev ct -l
```

- 14 When **wbak** completes, remove the diskette or tape from the drive and label it: `/sau8/domain_os.map`, `system_node_id`, `date` for a DS3000, or `/sau7/...` for a DS3500/4000/4500.





Chapter 7

Maintaining the System

Your system requires very little preventive maintenance. You should periodically clean the system surfaces and the heads in the cartridge tape drive as described in the following steps:

- 1 If you are cleaning a workstation, perform the shut down procedures described in Chapter 2. If you are cleaning a server, perform the shut down procedures in Chapter 3.
- 2 Clean the dust from the system front, side, and rear air-intake vents.
- 3 Clean the cabinet surfaces with an antistatic cleaner such as Chemtronics' **Plast-N-Glas**. This cleaner is available at most computer supply stores. Apply to cabinet by first spraying cleaner on a non-abrasive, lint-free cloth. Avoid spraying cleaner directly on cabinet surfaces and air vents.
- 4 To clean the monitor screen, use the **PerfectData Video Display Cleaning Kit** available through the *Instant Apollo* catalog or similar cleaning kit. Follow the instructions supplied with the kit to prevent screen damage.

- 5 Clean your cartridge tape drive after every 8 hours of use, or if you receive read/write errors. We recommend using the **PerfectData QIC Drive Cleaning Kit**, available through the *Instant Apollo* catalog or most computer supply stores. Follow the instructions that come with the kit to prevent cartridge head damage.
- 6 After cleaning a workstation, perform the start-up procedures described in Chapter 2. After cleaning a server, perform the start-up procedures in Chapter 3.
- 7 Make sure that the system unit and power supply are working.
- 8 If you are the system administrator, check the system error log as described in Chapter 4.



Appendix A

Calling for Service

Questions and problems that can't be resolved through your local service center should be directed to Apollo Customer Services at

1-800-2-APOLLO
(1-800-227-6556)

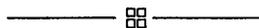
or

your designated service representative.

For countries outside the United States, contact your nearest Apollo sales and service center.

Before calling for service, have the following information ready:

- Your model and serial numbers (see Appendix B)
- A brief description of the problem, including any LED or screen-displayed error messages

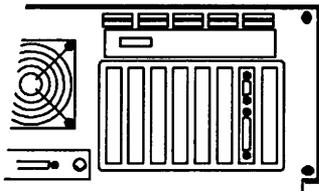




Appendix B

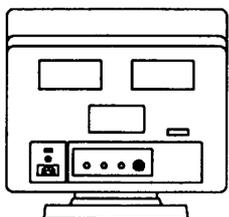
Recording Serial Numbers

Record the serial numbers of your components in this section so that you'll have them handy if you ever need to call for service. The illustrations show the location of each serial number.



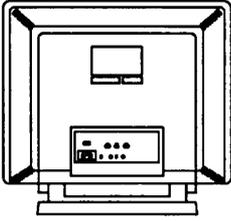
The diagram shows a side view of a computer system unit. A small rectangular label is located on the top edge of the front panel, positioned above the vertical ventilation slots. To the left of the unit, a speaker and a power button are also depicted.

System Unit Serial Number

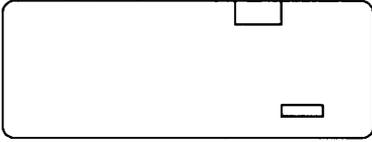


The diagram shows a front view of a 15-inch computer monitor. A small rectangular label is located on the bottom bezel of the monitor, centered horizontally.

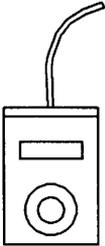
**15-Inch Color and Monochrome
Monitor Serial Number**



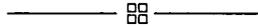
**19-Inch Color Monitor
Serial Number**



Keyboard Serial Number



Mouse Serial Number



Appendix C

Setting the System Calendar

This appendix describes how to set the system's date and time by running the **calendar** utility.

NOTICE: Your node should be shut down before running this procedure. Use care if you plan to set the **calendar** backwards. Doing this can result in the creation of duplicate file identifiers.

- 1 If you are setting the **calendar** on a server node, you must first connect a terminal or Domain node to the server. Refer to "Connecting a Terminal or Domain Node" in Chapter 3 for instructions. Proceed to Step 2 if you are setting the **calendar** on a workstation, or when you've finished connecting the server to a terminal or node.
- 2 If you are not already in Service mode, set the Normal/Service switch (SW2) to Service (down). You should be in Service mode to run the **calendar** routine.
- 3 Press the Reset button (SW1).

- 4 Set the calendar by typing the following:

```
<RETURN>
<RETURN>
md rev. n.n release n.n y/m/d
> ex calender <RETURN>
```

- 5 Your screen now displays a series of prompts. At the request to enter a disk type, enter w <RETURN> as shown on the following screen. Continue to type the appropriate information and press <RETURN> after each prompt.

```
> ex calendar
Apollo calendar utility, revision n.n, yy/mm/dd
Please enter disk type (W, S, or F) [lvno].
If ... enter none (N): w <RETURN>

      .
      .
      .

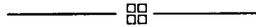
You should now shutdown and reboot the
system to run with the new calendar setting.
Done.
```

- 6 If you are setting the **calendar** on a personal workstation, ignore the message to shutdown and reboot, and go to Step 7.

If you are setting the **calendar** on a server node, you must turn off the terminal and server power and disconnect the RS-232 cable from the server's SIO1 connector. After you have disconnected the RS-232 cable, turn on the server power and go to Step 7.

- 7 If you were in Normal mode when you were directed to set the system calendar, return to Normal mode by setting the Normal/Service switch (SW2) to Service (down).

- 8 Return to the procedure you were performing at the time you were directed to set the system **calendar**.





Index

Symbols are listed at the beginning of the index.

Numbers

- 15-Inch Color Monitor
 - degaussing: 2-8
 - description: 1-2
- 15-Inch Monochrome Monitor,
 - description of: 1-2
- 19-Inch Color Monitor
 - degaussing: 2-8
 - description: 1-2
- 19-Inch Monochrome Monitor,
 - description of: 1-2

A

- Aegis Map File: 6-18, 6-26
 - copying to a cartridge tape:
 - 6-29
 - copying to a diskette: 6-28

B

- Boot PROM, revision date:
 - 6-14, 6-22
- bldt Command: 6-20

C

- Calling for Service: A-1
- Cartridge Tape
 - booting the operating system:
 - 5-16
 - inserting: 5-3
 - performing a Winchester
 - backup: 5-12
 - precautions: 5-3, 5-4
 - removal: 5-3
 - restoring from: 5-6, 5-10
 - retensioning: 5-5
 - running Standalone Utilities:
 - 5-15
 - types: 5-2
 - using new tapes: 5-5
 - write-protecting: 5-4
 - writing to: 5-8
- Cartridge Tape Drive
 - accessing: 5-6
 - location: 5-2
 - using: 5-1
- Cleaning
 - the cartridge drive: 7-1
 - the monitor: 7-1
 - the system: 7-1

CMD Key: 2-28, 3-17
Connecting, a terminal or
 Domain node: 3-3
Crash Status: 6-4
 code definitions: 6-11
Customer Services: A-1
calendar Command: C-2
cd Command: 6-18
cpboot Command: 5-15
cps Command: 3-17
crp Command: 3-18, 3-23

D

Disconnecting: 3-14
 a terminal or Domain node:
 3-9
Diskette
 dismounting: 4-10
 handling: 4-2
 initializing: 4-5
 inserting: 4-4
 mounting: 4-8
 removal: 4-11
 types: 4-2
 write-enabling: 4-3
 write-protecting: 4-12
Diskette Drive, Using: 4-1
Diskless Workstations, booting:
 2-23
DS3000, features and options:
 1-3
DS3500/3550, features and
 options: 1-5
DS4000, features and options:
 1-4

DS4500, features and options:
 1-6
Dump Storage Node: 6-20
Dumping Memory: 6-13
 across the network: 6-20
 page size: 6-23
 to a diskette or cartridge
 tape: 6-13
df Command: 6-21
di Command: 5-15, 5-17;
 6-16, 6-23
di n Command: 2-23; 3-9,
 3-12
du Command: 6-16, 6-23

E

Emulating a terminal: 3-5
emt command: 3-5
ex aegis Command: 3-9, 3-13;
 5-17

F

F1 Key: 3-5

G

go Command: 5-18

I

invol Command: 4-6

K

Keyboard, description: 1-2

L

LED, system unit location: 2-9

LEDs

during normal operation:
2-12

error codes: 2-13

understanding: 2-11

Log In, prompt: 2-20, 2-27

lcnod Command: 6-21

log-out Command, from a
remote process: 3-21

lvofls Command: 6-21

M

Mailbox Helper, running: 3-17

Maintenance, preventative: 7-1

Memory Dump, restrictions:
6-13

Mnemonic Debugger: 2-22;
3-11

Monitor

cleaning the screen: 7-1

degaussing: 2-8

positioning: 2-2

ventilation requirements:
2-2

Monitor Controls

brightness knob: 2-8

contrast knob: 2-8

degauss button: 2-8

power light: 2-8

power switch: 2-8

using: 2-3

voltage select switch: 2-8

mbx_helper Command: 3-15,
3-17, 3-23

N

Network Status: 6-2

Normal Mode, server: 3-6

Normal/Service Switch: 3-7,
3-10, 3-24; 6-3, 6-6
description: 2-10

location: 2-9

rebooting: 2-13

starting up in Normal Mode:
2-17

starting up in Service Mode:
2-21

netman Program: 2-14; 3-2;
6-20

netstat Command: 6-2

nodestat Command: 6-2

O

Operating Environments: ix

Operating System

booting from a node other
than a partner: 3-12

booting from a partner:
2-23; 3-12

booting from a system other
than a partner: 2-24

booting from cartridge tape:
5-16

botting the server: 3-2

loading: 3-13

rebooting: 2-13, 2-19
shutting down: 2-28
starting up in Normal Mode:
2-15
starting up in Service Mode:
2-21

Overview: 1-1

P

Personal Workstation,
description of: 1-1 to 1-6
Power Control, location: 2-3
Power Lights, location: 2-3
ps Command: 6-20
pst Command: 6-20

R

re Command: 2-23
Reset Button: 3-8, 3-24
RETURN Key: 2-22; 3-11,
3-19
Rebooting, the operating system.
*See Starting Up in Service or
Normal Mode*
Retensioning a Cartridge Tape:
5-5
rbak Command: 5-6, 5-10
reten Option: 5-5
rwmt Command: 5-6

S

SAU
requirement: 2-14; 3-2
requirements: 2-19

running from cartridge tape:
5-15

Serial Numbers, locating: B-1

Server

creating server processes:
3-23
description: 1-2; 3-1
editing and reading files:
3-22
executing commands: 3-22
logging in and out: 3-15
logging off remote process:
3-20
running programs: 3-22
shutting down: 3-24
starting up: 3-2

Server Process Manager: 3-15,
3-23

Service Mode

server: 3-10
personal workstation: 2-21

Shut Command: 2-28

Shutting Down

personal workstation: 2-28
server: 3-24

SIO Connector, location: 3-3,
3-4

Starting Up

personal workstation: 2-14
server: 3-2

System Crash: 6-8

recovering from: 6-1

System Hang, recovering from:
6-2

System Unit

cleaning: 7-1
controls: 2-9
description: 1-2
LED description: 2-10

Normal/Service switch
description: 2-10
power LED description:
2-10
power switch description:
2-10
Reset button description:
2-10
voltage selection switch
description: 2-10
System Unit Controls: 2-10
salvol Command: 6-12, 6-26
shut Command: 3-24
spm Command: 3-23
stcode Command: 6-11

V

Voltage Select Switch

monitor location:
2-15-2-19
system unit location: 2-9

W

Workstation, description: 1-2
Write-Enable Notch: 4-4;
6-15
Write-Protect Tab: 4-12
Write-Protection Switch: 5-4;
6-15
wbak, during memory dump:
6-19
wbak Command: 5-6, 5-8



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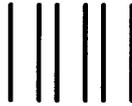
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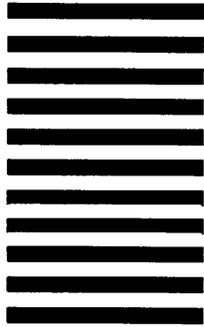
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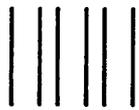
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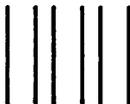
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