UltraStation 1E+

Model 170E+ and Model 200E+

Installation and User Guide

Limitation of Liability

Information presented by Tritec, Electronic GmbH in this manual is believed to be accurate and reliable. However, Tritec, Electronic GmbH assumes no responsibility for its use. No license is granted by implication or otherwise to any rights of Tritec, Electronic GmbH

Product specifications are subject to change without notice.

TRADEMARKS

1

Contents

Product Placement v

Power Cord Connection vi

Lithium Battery vii

System Unit Cover vii

Preface viii

Who Should Use This Book viii

Related Software viii

How This Book Is Organized xi

What Typographic Changes Mean x

1. UltraStation 1E+ Installation Overview 1

System Overview 1

EnergyStar 2

Safety Information 3

Environmental Concerns 3

Power Requirements 3
Cable Requirements 4
Unpacking the Equipment 4
Planning the Workstation Site 5
Space Requirements 5
Power Outlets 5
Network and Standalone? 6
Description of Delivered Cables 7
Standard Cables 7
Optional (Extra) Cables 9
Back Panel 11
Installation Task Map 12
2. Installing the UltraStation 1E+ 15
Before You Start 16
Tools Required 16
Installing the Color Monitor 16
Connecting the Mouse and Keyboard 17
Connecting the Power Cords 19
Connecting the Network Cable 20
Powering On the UltraStation 1E+ 21
Before You Start 21
Tools Required 21
Confirming the System Installation 21
Powering On the System 22

Testing the System 23
Powering Off the System 24
3. Using Diskettes 27
Handling Diskettes 28
Inserting and Ejecting Diskettes 28
4. Using CD-ROM 29
The CD-ROM Front Panel 30
Audio Output Jack 30
5. Internal Extensions 31
Planning your Internal Extensions 31
Opening and Closing the System Unit 32
Opening the System Unit 32
Closing the System Unit 34
Installing Memory Modules 35
About UltraStation 1E+ DSIMMs Memory Module Installation 35
How to Turn the Power Off 35
Attaching the Wrist Strap 36
Identifying DSIMMs 37
Inserting a DSIMM 39
Removing DSIMMs 42
Changing the Serial Port Jumpers 44
Updating Open Boot Prom (OBP) 45

6. Installing External Devices **47**
Audio Ports 48
Bidirectional Parallel Port 49
Serial Ports 50
7. Configuring the System **53**
A. Back Panel Connector Specification **55**
Audio Connector Specification 63
B. Back Panel Connector Specification **65**
Internally 65
Externally 65

Safety Agency Compliance

This preface describes safety precautions to follow when installing your system.

For system safety, observe the following precautions when setting up your equipment:

- Follow all warnings and instructions marked on the equipment and in this manual.
- Be sure the voltage and frequency of your power matches what is inscribed on the equipment's electrical rating label.
- Do not insert objects of any type through the openings in the equipment. Dangerous voltage may be present. Electric shock or damage to your equipment could result from the short circuit inducted by foreign objects.

Product Placement

It is important to follow the instructions on product placement as outlined in chapter 1 "UltraStation 1E+ Installation Overview".

Openings in the equipment should not be blocked, or there may be reliability problems with your UltraStation 1E+. The workstation should never be placed near a radiator or heat register or in direct sunlight.

Power Cord Connection

The UltraStation 1E+ is designed to work with single-phase power systems having a grounded neutral conductor. Do not plug your UltraStation 1E+ into any other type of power system or electrical shock may result. If you are unsure of the type of power supplied to your building, contact a qualified electrician or your facilities manager.

All power cords do not have the same current ratings. Household extension cords are not meant to be used with your UltraStation 1E+ equipment because they do not have sufficient current ratings. Therefore, do not use household extension cords.

UltraStation 1E+ is shipped with grounding-type power cords. Always plug the cord into the grounded power outlet to reduce the risk of electric shock.

Lithium Battery

The lithium battery found on the main logic board is not customer replaceable. Do not disassemble or attempt to recharge it.

System Unit Cover

In order to add memory, boards, cards or internal storage devices, you must remove the system unit cover. Be sure to replace the cover before powering on your system unit.

It is not safe to operate the UltraStation 1E+ without the system unit cover in place. Failure to comply with this precaution can result in personal injury and system damage.

Preface

This Installation and User Guide provides instructions for installing and using the UltraStation 1E+

Who Should Use This Book

This manual is intended for all levels of users. You should be familiar with the parts of the computer system and basic computer terminology. Installing the UltraStation 1E+ system will require you to install the workstation hardware and configure the system software.

Related Software

Other manuals that may be required for reference include:

- *Getting Started with Solaris 2.5 or higher*
- *Solaris Open Window Installation and Start-Up Guide*
- Installation guides for peripheral devices connected to your system

How This Book Is Organized

This guide gives instructions for installing the standard system and describes peripheral device ports on the rear panel. You should refer to the peripheral device manuals for specific installation instructions. If you are adding internal options, refer to part 3 of this manual for installation instructions.

The installation task map in "Installing the UltraStation 1E+ Hardware" guides you through the complete sequence of installation steps. It may be helpful to read all the chapters in order before you begin to follow specific instructions.

It is essential that your read and understand the safety precautions and "Safety Agency Compliance". These safety precautions and instructions explain how to work safely with the components of your system.

Chapter	Description
Manual Preface	Lists the required tools and documentation for installing the UltraStation 1E+ system. It also describes how to use this book.
Chapter 1: UltraStation 1E+ Installation Overview	Gives an overview of the UltraStation 1E+ system, safety information and environment concerns, and how to unpack the system. It also includes a task map of steps required to completely set up the system.
Chapter 2: Installing the UltraStation 1E+	Provides instructions for setting up the standard UltraStation 1E+ hardware. Describes the instructions for powering on the UltraStation 1E+, testing the system, and powering off the system.
Chapter 3: Using Diskettes	Explains how to handle and use diskettes with the floppy disk drive.
Chapter 4: Using CD-ROM	Explains how to handle and use the CD-ROM drive.
Chapter 5: Internal Extensions	Describes how to open and close the chassis, how to change memory modules and serial port jumpers.
Chapter 6: Installing External Devices	Describes the I/O ports on the rear panel and how to connect external devices.
Chapter 7: Configuring the System	Describes how to configure the operating system.

What Typographic Changes Mean

The following table describes the typographic changes used in this book.

Table P-1 Typographic Conventions

Typeface or Symbol	Meaning	Example
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. machine_name% You have mail.
`AaBbCc123`	What you type, contrasted with on-screen computer output	`machine_name% su` `Password:`
AaBbCc123	Command-line placeholder: replace with a real name or value	To delete a file, type `rm` *filename*.
AaBbCc123	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in ***User's Guide***. These are called ***class*** options. You ***must*** be root to do this.

1 UltraStation 1E+ Installation Overview

This chapter will prepare you for installing the UltraStation 1E+. The installation task map in this chapter gives an overview of steps required to set up your complete system. This chapter also includes information on selecting a suitable location for your workstation.

System Overview

The UltraStation 1E+ is a high-performance workstation, based on UltraSPARC™ and multimedia technology, and is fully compatible with the Sun Ultra 1. The standard UltraStation 1E+ includes:

- One Ultra SPARC™ CPU at 170 MHz (Model 170E+) or 200 MHz (Model 200E+) with 512 MB 2nd level cache
- A minimum of 32 MB (2x 16 MB) of standard memory that can be expanded to 512 MB with pairs 16 MB, 32 MB or 64 MB DSIMM modules.
- Color monitor and SBus Turbo GX or Creator graphics board
- Keyboard and 3-button mechanical mouse
- An internal wide hard disk drive with Solaris 2.5 or higher operating system preinstalled
- Optional internal 3.5" floppy disk drive and/or internal CD-ROM drive
- Two serial ports and a Centronics-compatible parallel port
- Four SBus expansion slots (one may be used for the frame buffer)

- One UPA-Bus connector for one Creator grahics board
- 16 bit stereo audio analog interface
- Cables and power cords
- Solaris documentation with CD-ROM and Desktop license
- Hardware documentation

Note – Do not reformat the hard disk drive. Reformating will remove the Solaris operating system that is already installed on your system.

EnergyStar

The UltraStation 1E+ is EnergyStar compliant. Power Management software can be activated.

- If the system is idle for a specified period of time, a power cycle request is generated and the system is shut down automatically by the power management software.
- The power management software also monitors the frequency of the requests and determines if the thermal shock of power cycling would contribute to decreasing the reliability of the hardware. If so, the power-cycle request is deferred.

The above achieves EnergyStar compliance and represent a „no-power" mode. In addition, the hardware provides the ability to be in a „low-power" mode where the system is capable of responding to external events such as network activity.

Need more information? – For a detailed description see "Using Power Management" in the user answerbook.

Safety Information

For your protection, observe the safety precautions given in the preface, "Safety Agency Compliance" when setting up your equipment.

Environmental Concerns

The UltraStation 1E+ electronics requires a dust-free, well-ventilated or air-conditioned work environment to run properly. Acceptable environmental conditions are listed in Table 1-1.

Table 1-1 Environmental Specifications (Working Conditions

Specification	Range
Temperature	0 to +40 degrees Celsius
Humidity	5% to 80% relative noncondensing
Altitude	-300 to 3,000 m above sea level

Table 1-2 Environmental Specifications (Storage and Transportation Conditions)

Specification	Range
Temperature	-40 to +80 degrees Celsius
Humidity	98% relative noncondensing
Altitude	-300 to 12,000 m above sea level
Shock and vibration	28g/11 ms

Power Requirements

The UltraStation 1E+ and related equipment use nominal input voltages of 115 VAC or 230 VAC. These products are designed to work with single-phase power systems that have a grounded conductor.

The UltraStation 1E+ system unit contains a self-selecting power supply that senses the input voltage and selects the appropriate voltage setting automatically. Other components, such as the monitor and/or disk or tape drives, may require that a switch be set to the correct voltage setting.
Contact a qualified electrician or facilities manager if you are not sure what type of power is supplied to your building.

Cable Requirements

Appropriate cables must be used to ensure safety and a high level of performance. Cables supplied with your equipment meet the needs of most installations. Some of the cables are of specific lengths to conform with engineering and safety standards. Using other cables can be hazardous and can degrade system performance.

If you find the cables supplied with your workstation are too short for your installation, ask your sales representative about the availability of alternate cables.

Warning – Do not use household extension cords with the UltraStation 1E+ system or related equipment. Household extension cords do not have the same current ratings or overload protection, and are not meant for use with computer equipment.

Unpacking the Equipment

If the shipping cartons or equipment were damaged, notify the shipping company representative and save the shipping cartons for inspection.

Caution – Use care when unpacking the system unit and monitor. They are packed tightly in protective foam molds and are quite heavy.

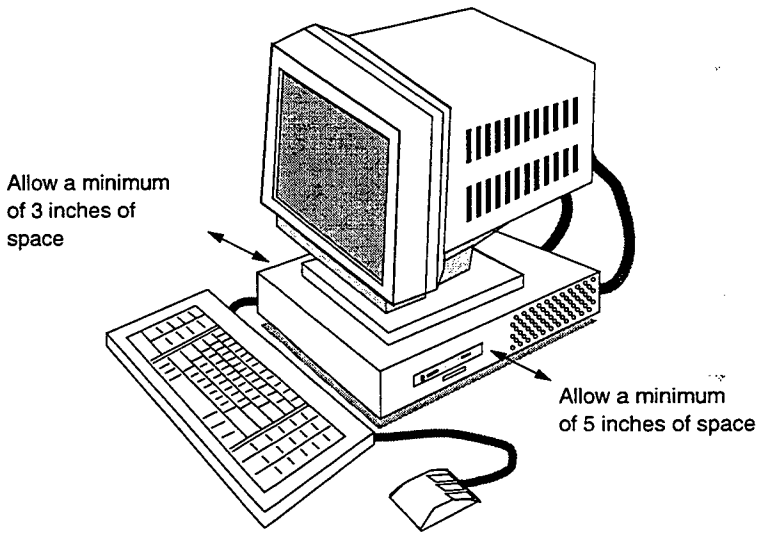
Save the shipping cartons and packing material in case you need to transport the workstation.

Planning the Workstation Site

Space Requirements

When selecting a location for your workstation, be sure to allow space for the system unit, keyboard and mouse, and any external devices to be installed. The UltraStation 1E+ system unit has vents on the left and right panel that require a minimum of 3 inches of unobstructed space for airflow. The system unit also has a floppy disk drive and/or a CD-ROM drive that requires space to insert and remove the media.

Figure 1-1 Placing the Workstation



Power Outlets

The workstation site must also provide access to enough power outlets for the system unit, and any external devices, such as printers, disk or tape drives, that you install with your system. See "Cable Requirements" later in this chapter for more information.

Network and Standalone?

There are two ways to set up the UltraStation 1E+: *networked*, where two or more systems communicate and share software and files with other systems, or *standalone*, a single system with its own software and files.

Setting up a system on the network requires assistance from your system administrator. For network use, an Ethernet tap must be installed at your site, and you must have a transceiver cable to connect your system to the Ethernet tap. The Ethernet tap is set either in the wall or the floor, or it is descend from the ceiling. The procedure you follow depends on how you plan to use the system. There are three ways a system in a network can be set up:

- Networked System: As part of a network, your system is one of multiple workstations communicating and sharing resources like data, files, and printers. For this installation, the system administrator must prepare the network to accept a new system by first setting up the system information on the server.
- Server: This is a system that provides basic services to other systems on the network. It must be the first system set up on a new network.
- Client: These are all systems installed after the master server.

Need more information? – For more information about networks and installing systems in a network, see *Getting Started with Solaris.*

Description of Delivered Cables

Standard Cables

Each UltraStation 1E+ system unit comes with the cables shown in Figures 1-2 to 1-6.

Figure 1-2 Power Cable for UltraStation 1E+ (Country dependent)

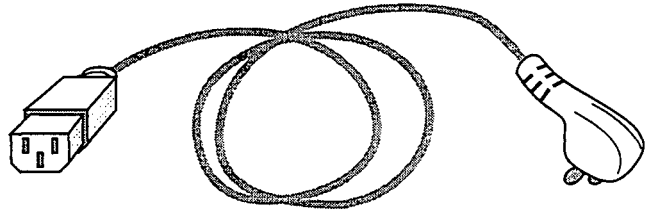


Figure 1-3 Power Cable for Monitor

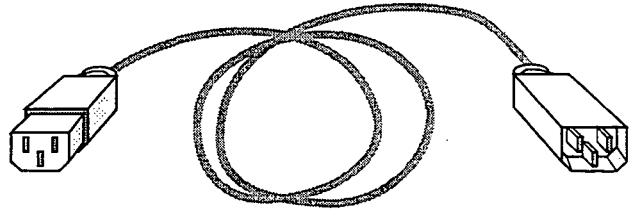


Figure 1-4 Keyboard Cable

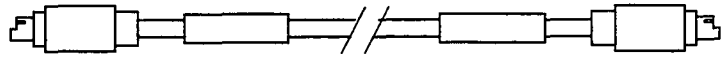
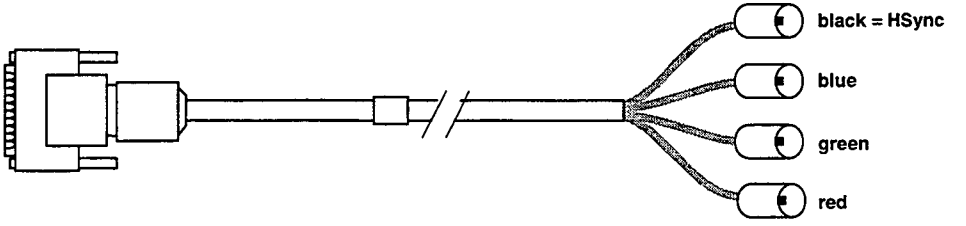


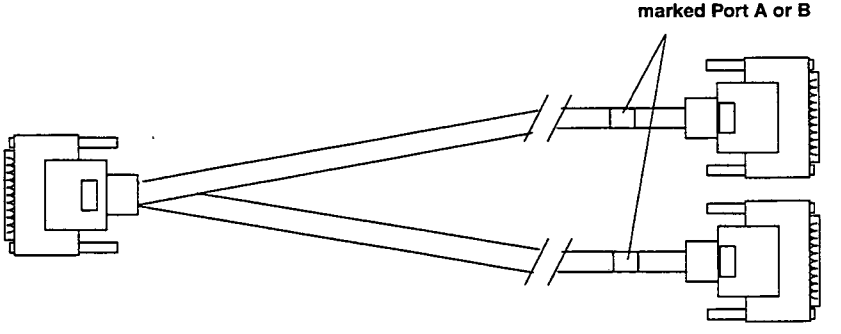
Figure 1-5 Video Cable



This cable is graphics board and monitor dependend and thus may be different.

Note – Some of the cables shipped with your system have plastic caps to protect the connectors. Remove the protective caps before using the cables.

Figure 1-6 Serial Interface Y-Cable (Split Cable)



Optional (Extra) Cables

The cables shown in Figures 1-7 to 1-11 do not come packed with your UltraStation 1E+ system, and must be ordered separately for use with peripheral devices (for example, printers and external disk drives) and networks (for example, thick Ethernet) that require them.

Figure 1-7 Twisted-Pair Ethernet Cable

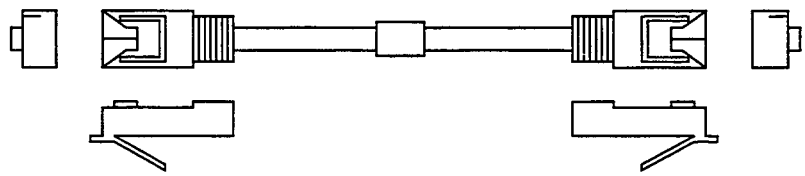


Figure 1-8 MII to AUI (10 MBit) Ethernet Cable

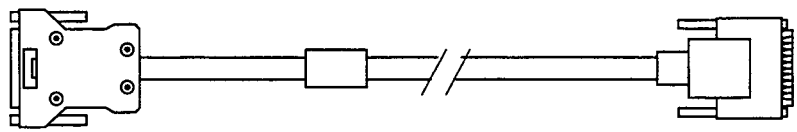


Figure 1-9 Parallel Interface Cable,
Centronics™ Interface 25-pin Sub D male to 36-pin Centronics

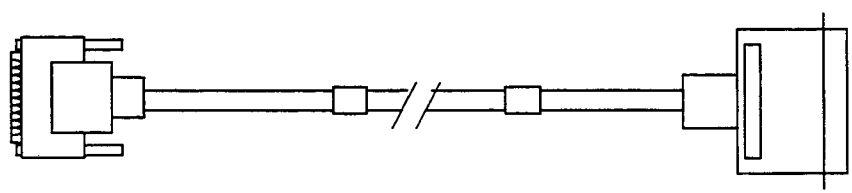


Figure 1-10 Small Computer System Interface (SCSI) Cable 68-pin High Density to 50-pin Centronics

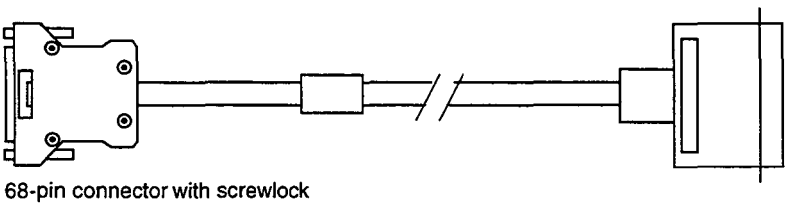


Figure 1-11 Small Computer System Interface (SCSI) Cable 68-pin High Density (HD) to 68-Pin HD

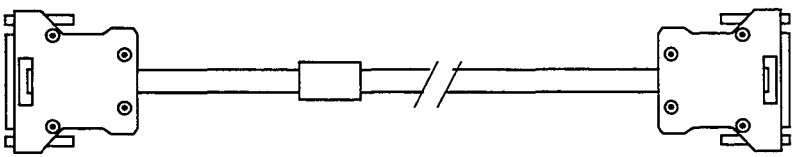


Figure 1-12 SCSI Adaptor 68-pin HD to 50-pin High Density (HD) with active termination on upper data lines

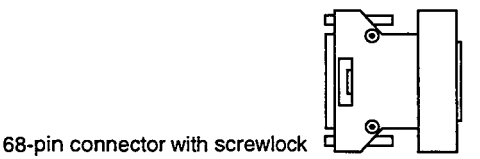
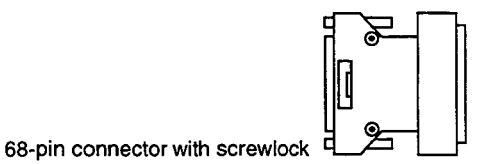


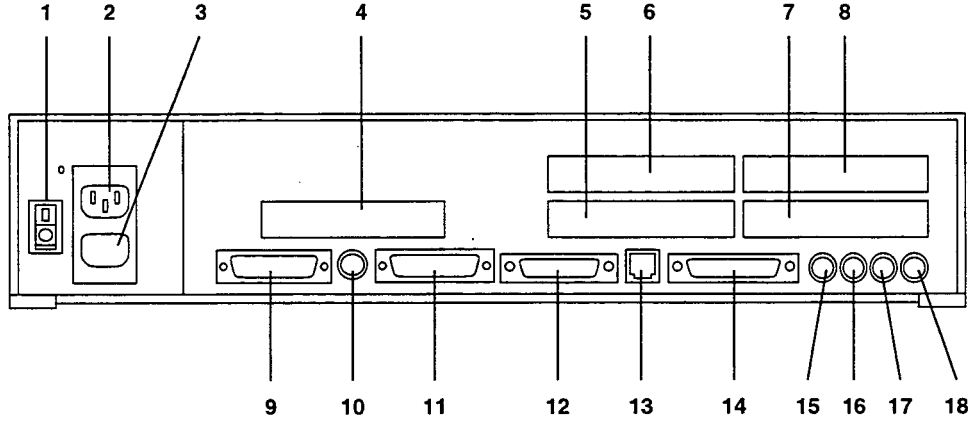
Figure 1-13 SCSI Adaptor 68-pin HD to 50-pin Centronics with active termination on upper data lines



Back Panel

The back panel has a power switch, a power receptable, connector openings, and ports. These are shown in the following figure to help you to locate them as you connect the rest of the system.

Figure 1-14 Back Panel



1 AC On/Off push button switch
2 AC power receptacle
3 AC power outlet
4 Creator graphics (UPA bus)
5 SBus (Slot 0)
6 SBus (Slot 1)
7 SBus (Slot 2)
8 SBus (Slot 3)
9 Parallel Port
10 Keyboard/Mouse Port
11 Serial Port A/B
12 MII Ethernet Connector
13 Twisted-Pair Ethernet Connector
14 SCSI Port
15 Headphone
16 Line-out
17 Line-in
18 Microphone

Need more information? – Refer to Appendix A "Back Panel Connector Specification" for more information.

Installation Task Map

Note – The UltraStation 1E+ is ready to run when you receive it. It is a good practice to test the workstation before you add any options or peripheral devices.

The first step of the system installation consists of:

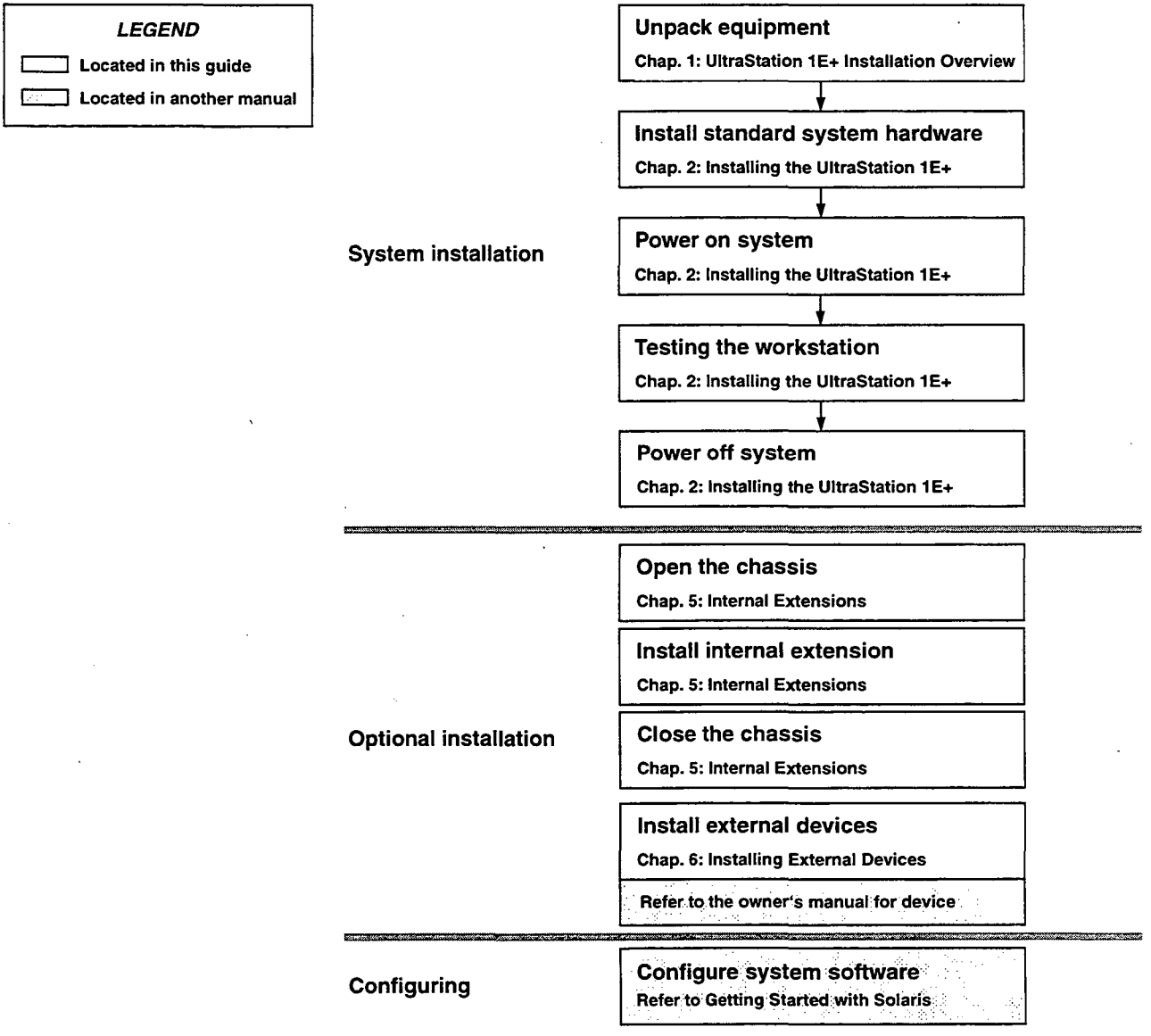
- Setting up the standard system hardware
- Powering on the system
- Test the workstation
- Powering off the system

The second step of the system installation may be:

- Adding options such as DSIMMs, SBus cards or a hard disk drive that need to be installed inside the system unit.
- Connecting peripheral devices, such as an external storage devices, a printer or a scanner to the rear panel of the system unit
- Configuring the operating system for your workstation

The task map below shows the sequence of the installation steps and whether the installation instructions are provided in this guide or another manual.

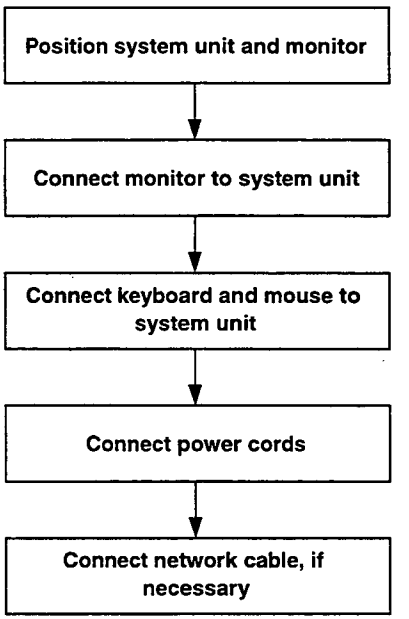
Figure 1-15 Installation Task Map



2 *Installing the UltraStation 1E+*

This chapter covers installation of the standard UltraStation 1E+ hardware. It may be helpful to read through this chapter before you start the installation. Hardware installation requires these tasks:

Figure 2-1 Hardware Installation Task Map



Before You Start

To prepare for system installation, position the system unit in the workspace and place the monitor on top of the system unit.

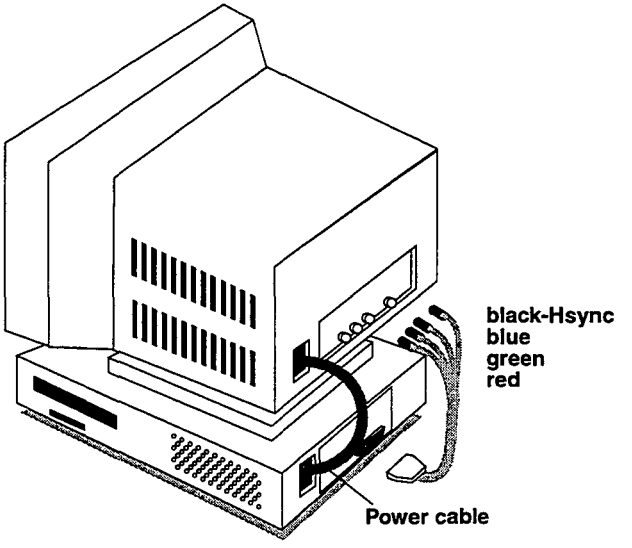
Tools Required

The procedures in this chapter do not require any tools. However, if you are connecting the system to a network, you will need to obtain an Ethernet cable from your system administrator.

Installing the Color Monitor

This section contains instructions for installing a color monitor. The rear panel of the color monitor is shown in Figure 2-2 for reference during the installation.

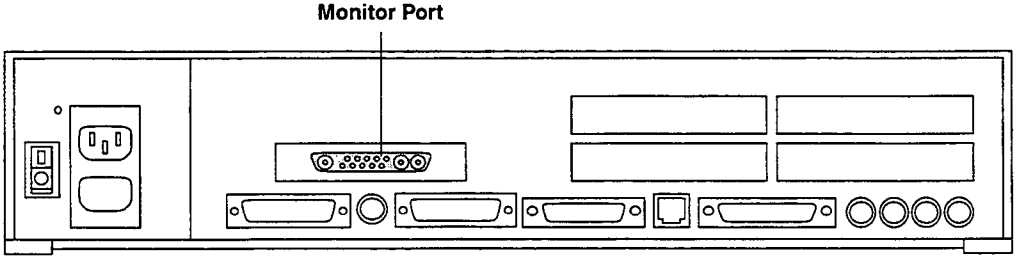
Figure 2-2 Color Monitor Cabling



▼ To install the color monitor:

1. **Connect the cable with the four BNC connectors to the connectors on the monitor rear panel labelled Red, Green, Blue, and Sync.**
2. **Turn the BNC connectors one-quarter turn clockwise to tighten.**
3. **Connect the other end of this cable to the connector port on the system unit rear panel and tighten the thumbscrews.**
4. **Connect the monitor power cord to the connector on the monitor rear panel and the outlet of your UltraStation 1E+ as in Figure 2-2.**

Figure 2-3 Installing the Color Monitor on UltraStation 1E+ with Creator



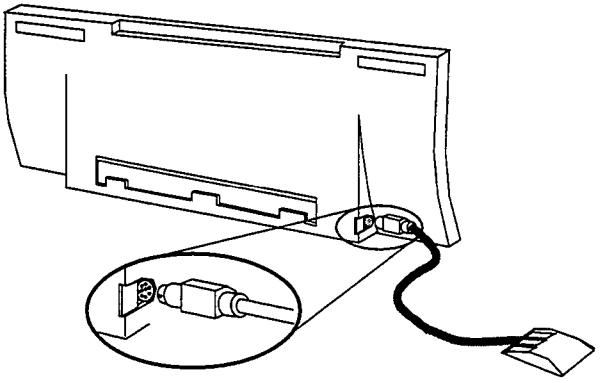
Connecting the Mouse and Keyboard

In this procedure, you will connect the mouse to the keyboard, then connect the keyboard to the system unit.

▼ To install the mouse and keyboard:

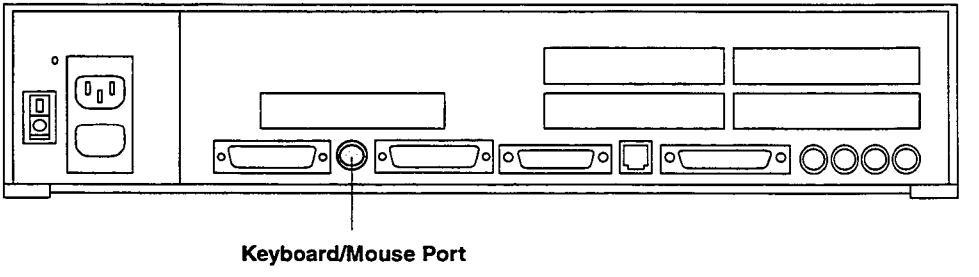
1. **Connect the mouse cable into one of the keyboard jacks, depending on where you want to locate the mouse on your desktop. See Figure 2-4.**
   - To use your right hand to move the mouse, connect the mouse cable into the jack on the right side of the keyboard.
   - To use your left hand to move the mouse, connect the mouse cable into the jack on the left side of the keyboard.

Figure 2-4 Connecting the Mouse Cable



2. **Press the loose cable into the groove underneath the keyboard, as shown in Figure 2-4.**
3. **Connect one end of the keyboard cable into the free keyboard jack.**
4. **For example, if you connected the mouse into the right keyboard jack, use the left keyboard jack for the keyboard cable.**
5. **Connect the keyboard cable into the keyboard port on the rear panel, shown Figure 2-5.**
6. **Align the key groove on the cable connector with the slot on the port and push the connector firmly into the port.**

Figure 2-5 Connecting the Keyboard Cable



Connecting the Power Cords

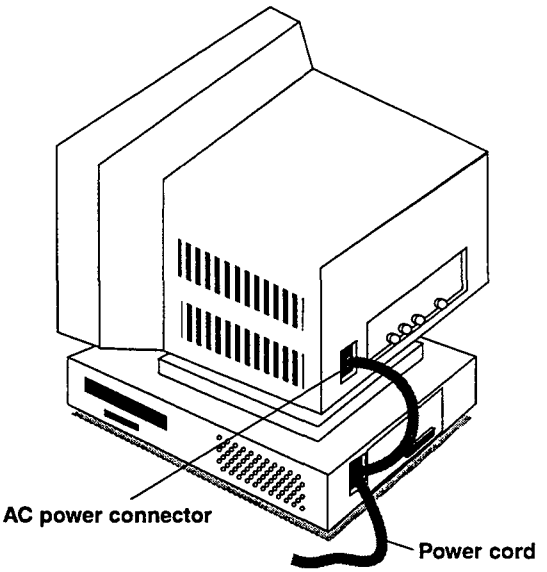
In this procedure, you will connect the monitor and system unit power cords.

▼ To connect the power cords:

1. **Connect the female end of the power cord into the power connector on the monitor rear panel, shown in Figure 2-6.**

Note – Make sure the monitor power switch is in the OFF position. The switch can be located in different places depending on the monitor, but the most common locations are on front or rear panels.

Figure 2-6 Monitor Power Connector



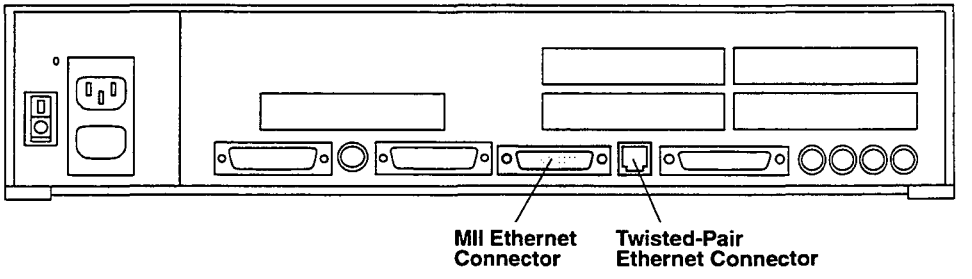
2. **Connect the male end of the power cord into the power outlet.**
3. **Plug the female end of another power cord into the power connector on the system unit rear panel.**
4. **Plug the male end of the system unit power cord into a power outlet.**

Connecting the Network Cable

If the system is being connected to a network, you will need an Ethernet transceiver cable. This cable is not supplied with your system, but can be obtained from the person in charge of the network.

The rear panel has two Ethernet ports, the MII and twisted-pair Ethernet (TPE) which are shown in Figure 2-7.
Only one of the two interfaces can be used at the same time. If only one interface is connected, software determines automatically which one is to be used.

Figure 2-7 Ethernet Ports



▼ To connect to a Twisted-pair Ethernet (TPE) network:

- Connect the twisted-pair Ethernet cable to the twisted-pair Ethernet port. You need a one to one cable.

▼ To connect to an AUI Ethernet or BNC Ethernet network:

- Use a special converter which is available as an option. The converter comes with a twisted-pair cable and is connected to the twisted-pair Ethernet connector.

Powering On the UltraStation 1E+

This chapter gives instructions on powering on your system for the first time and how to set up your system configuration.

Before You Start

The system should be at room temperature before you power it up. If the equipment was shipped when outdoor temperatures were significantly above or below room temperature, it is best to wait several hours before powering on the system.

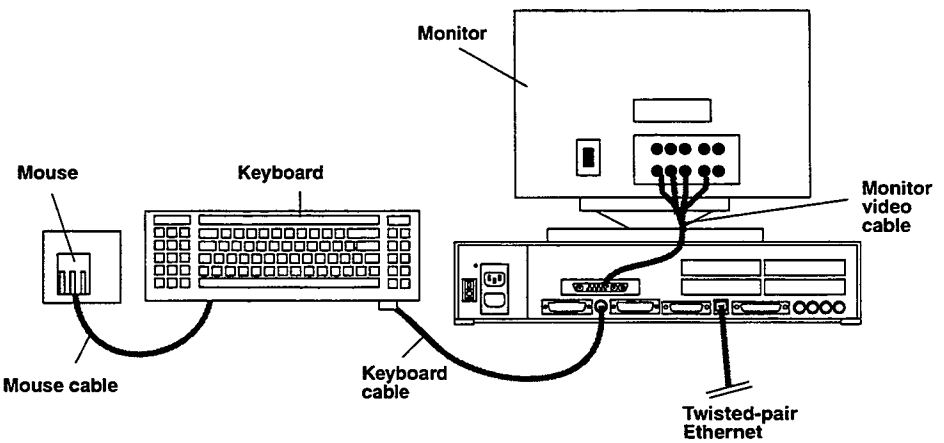
Tools Required

The procedure in this chapter do not require any tools.

Confirming the System Installation

Before powering on your system for the first time, check that all the parts of the system have been connected properly. Loose cables are a common source of failures. The rear panel connections of an UltraStation 1E+ are shown in a network set up in Figure 2-8.

Figure 2-8 Network System Set Up for UltraStation 1E+ with Creator Graphics



Powering On the System

This procedure explains how to power on the UltraStation 1E+ for the first time.

▼ To power on the system for the first time:

1. **Turn on the monitor power switch.**
2. **Turn on the power switch on the system unit rear panel.**
3. **The LED on the front panel of the system unit will light and the monitor LED as well. The system will then run power-on tests. While the tests are running, additional messages will display on the screen. If you do not see the banner screen within 40 seconds when you turn on the power, the system may have failed a power-on test. Call your authorized service representative for assistance.**

Note – When the system fails a power-on test, it sends failure messages to serial port A on the back panel. If you have a terminal connected to serial port A, test failure messages display on the terminal screen. A monitor is different from a terminal, and is not connected to port A.

Warning – Don't attempt to switch off before reading the paragraph "Powering Off the System" in this chapter. To do so without taking care will destroy your installed operating system

---

▼ To power on the system after the first time:

1. **Turn on power to any external SCSI devices connected to the system.** When you have multiple external SCSI devices in a daisy-chain, begin with the last device in the daisy-chain.
2. **Press the power on button of your system keyboard (upper right button).**
3. **See step 3 above.**

Testing the System

The previous chapter explained how to switch on your system and boot. Now during the booting procedure the Solaris operating system should display several messages on the screen. The last one is a login prompt. Log in as root, no password is set by default.

```
login: root <RETURN>
```

The system is configured to start the Open Windows automatically. If Open Windows is up, you should see the console window, the filemanager and command tool. At this point you can be sure that your workstation is free of any major problems. No further testing is necessary.

Note – If your system is networked and you haven't already set your correct IP address, warning messages concerning the network will be displayed during boot. Contact your system administrator to get a correct IP address.

For further information how to configure your workspace, see the Solaris End User answer book.

Powering Off the System

This section explains how to safely power off your system. The UltraStation 1E+ is designed to be left running continuously, but energy can be saved by using the Power Management Tool of Solaris.

▼ When turning the Power Off

▼ Turn off the power only if you want to:

- Remove or install a part inside the system unit.
- Install an external drive unit.
- Unplug the system unit power cord, for example, when moving the system to a new location.
- Recover from a "hung" or "frozen" system that does not respond to the keyboard or the mouse.
- Prepare for an expected power outage in your building.
- Save energy

Note – You cannot plan for unexpected power outages. When one occurs, turn off the power switches on all equipment. Doing this protects your equipment from possible power surge damage when power is restored to the building.

▼ Powering Off Procedures

▼ To power off when the system is working normally:

1. **Save all your work.**
2. **Open a shelltool and, at the system prompt. If you are superuser, go to step 4., otherwise type:**
   `/bin/su <RETURN>`
3. **Enter your superuser password.**

4. **At the system prompt, type:**
   `/usr/etc/halt <RETURN>`

   The system responds with the following message:

```
Syncing file systems ...      done
Halted

ok
```

5. **When this appears, you can either type: power-off <RETURN>**
   or press **<shift power key>**

   and the power supply will switch off your system or you can safely turn off the power of the system unit. Turn off the power in the following sequence:

   - External drive units (if any)
   - System unit
   - Monitor

Need more information? – For additional information about superuser passwords, see "Working with User Accounts", in *Getting Started with Solaris.*

▼ To power off when the system doesn't respond to the mouse:

1. **Press `<L1>` `<a>` at the same time.**
   The ok prompt will appear.

2. **Type: `sync <RETURN>`**
   The sync command will attempt to save your data.
   When the ok prompt returns, you can turn off the power as described in step 5 above.

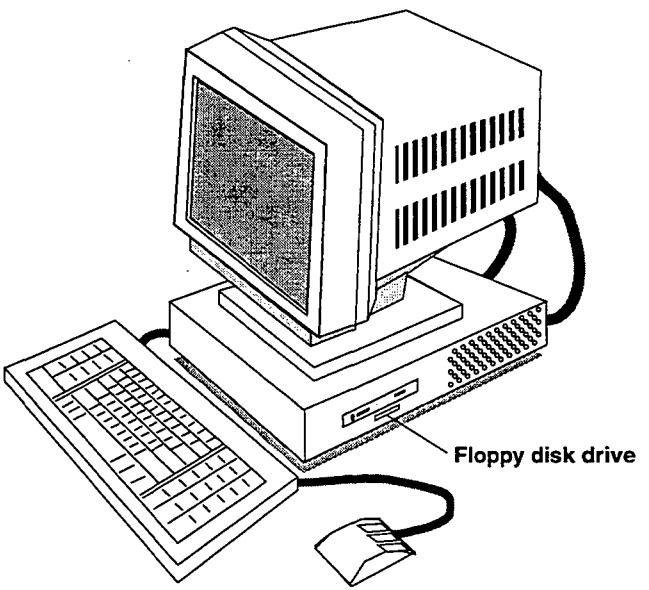
Need more information? – For more details, see "Power Management Tool" in the Open Windows User Manual.

---

3 *Using Diskettes*

This chapter discusses the use of diskettes with the floppy disk drive on your UltraStation 1E+. The format for diskettes used with the system is 3.5-inch, 1.44 MB. The floppy disk drive is located on the UltraStation 1E+ side panel, shown in Figure 3-1.

Figure 3-1 Floppy Disk Drive Location



Handling Diskettes

Use the following guidelines when handling and storing diskettes:

- Store the diskettes in a clean, dry environment
- Keep diskettes away from direct sunlight and extremes of hot or cold
- Keep diskettes away from magnetic sources

Inserting and Ejecting Diskettes

The steps for inserting and ejecting diskettes from the floppy disk drive are given below.

Need more information? – Before using a new diskette, it must be formatted using Solaris commands. For more information on formatting diskettes and using other Solaris commands, refer to *Getting Started with Solaris.*

▼ To insert a diskette into the floppy disk drive:

- With the label side up, insert the diskette into the drive.
  You will feel some resistance when the diskette is about to lock into place. Push firmly yet gently until you hear the diskette click into the correct position.

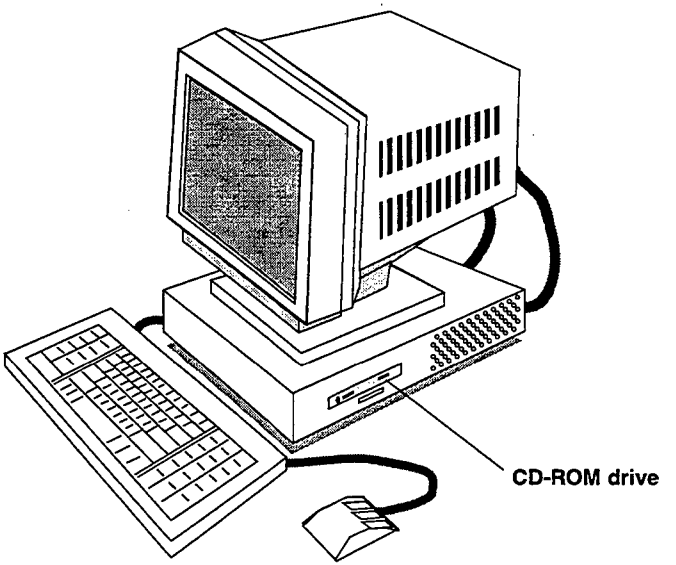
▼ To eject a diskette using the floppy disk drive:

- Type the `eject` command at the system prompt shelltool:
  `eject`

4 Using CD-ROM

This chapter discusses the use of the CD-ROM drive on your UltraStation 1E+. The optional available CD-ROM drive operates on the industry standard SCSI-2 interface. The CD-ROM drive uses 4.76-inch (120-millimeter), 644 MB compact discs. It is located on the UltraStation 1E+ side panel, shown in Figure 4-1.

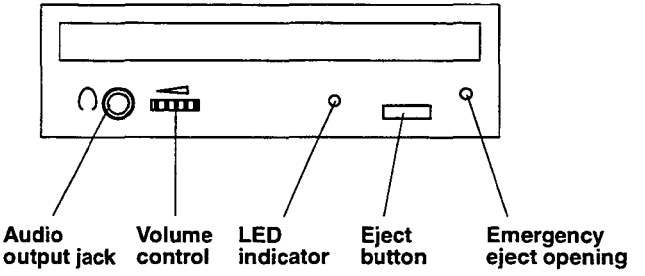
Figure 4-1 CD-ROM Drive Location



The CD-ROM Front Panel

The front panel connections and controls of the CD-ROM are shown in Figure 4-2.

Figure 4-2 CD-ROM Front Panel



- Audio output jack - used with speakers or headphones when playing CD.
- Volume control - adjusts sound level for the audio output jack
- LED indicator - shows the CD drive operative status
- Eject button - allows manual ejection of a loaded disc
- Emergency eject opening - allows a disc to be ejected in an emergency (if software or manual ejection fails)

Audio Output Jack

You can plug the following devices into the miniature audio output jack:

- Headphones (30 ohms to 100 ohms impedance)
- External amplifier and loudspeaker

Caution – Prolonged exposure to high audio signal levels can be harmful to human hearing and can result in permanent and irreversible hearing loss!

5 Internal Extensions

Planning your Internal Extensions

The UltraStation 1E+ allows for many internal extensions i.e. SBus boards, harddisks, etc.. Not all of these extensions can be mounted at the same time due to power supply limitations and overtemperature problems.

The following table allows you to check for the extension which can be used at the same time inside of the workstation. The total internal power consumption allowed is 180 W. The motherboard itself uses max. 100 W including DRAM, floppy, mouse and keyboard. The remaining 80 W can be distributed by the following devices. All values shown are max. values for typical devices.

Table 5-1 Power Consumption of Internal Extensions

Device	Power Consumption
Fast Frame Buffer (2D) Creator	15 W
SBus boards	10 W/slot
CD ROM	10 W
DAT Tape	10 W
Harddisk 1G	typ. 8 W
Harddisk 2G	typ. 16 W
Harddisk 4G	typ. 16 W
Harddisk 4G Baracuda	typ. 18 W

For example	1x Creator	15 W
	1x Harddisk 4G	16W
	3x SBus	30 W
		--------
		61 W

Since 61 W is less than 80 W this is a valid configuration.

Opening and Closing the System Unit

To install SBus cards, DSIMMs, or an internal disk drive; or to change the serial port jumper settings on the main logic board, you must open the system unit.

Opening the System Unit

The top cover of the system unit attaches to the chassis at the back with two screws. Shift the cover approximately 5 cm to the front and remove the cover (see Figure 5-1).

▼ To remove the cover from the system unit:

1. **Place the system unit on a work table.**
2. **Remove the top cover from the system unit.**

- Use a screwdriver to fully loosen the screws holding the cover to the back panel.
  The captive screw will remain attached to the back panel after it is fully loosened from the cover.

Figure 5-1 Screw Location, Back Panel

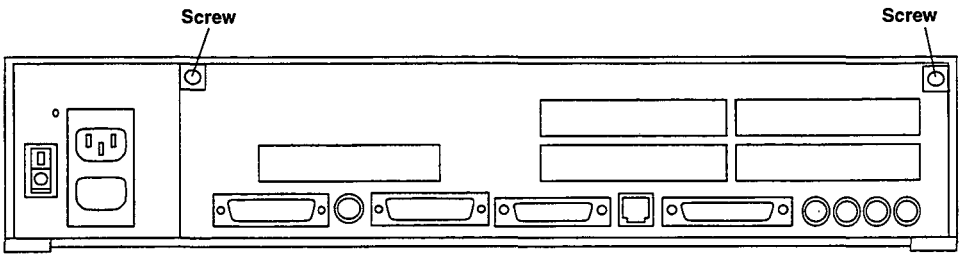
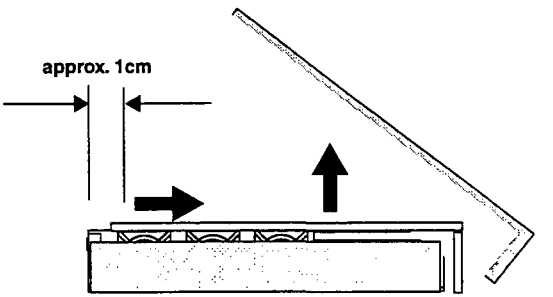


Figure 5-2 Removing the System Unit Cover, Side View



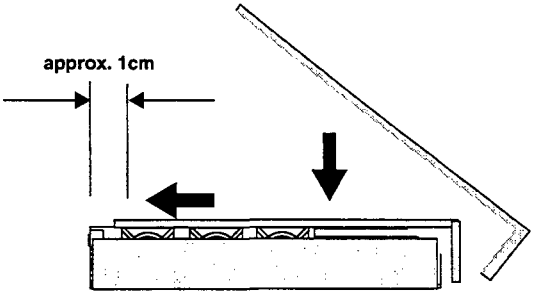
Warning – Before powering up your system again, be sure to replace the cover using the procedure in the next section. It is not safe to operate the UltraStation 1E+ without its top cover in place.

Closing the System Unit

▼ To replace the system unit cover:

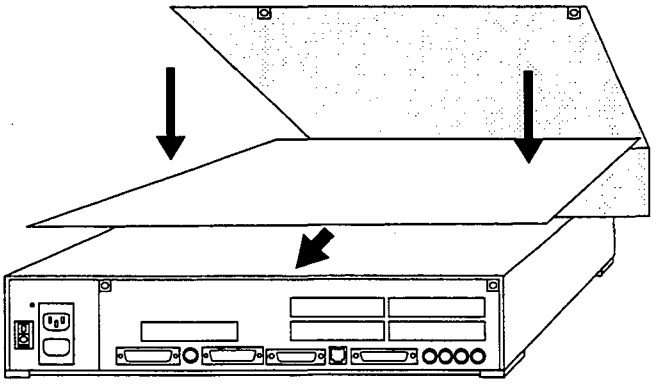
1. **Hold the cover at a 60 degree angle in relation to the system unit, and gently guide the hinge hooks on the cover into the tab slots on the front of the system unit. Continue to hold the cover with your hands.**

Figure 5-3 Replacing the System Unit Cover, Side View



2. **Slowly lower the cover onto the system unit.**
3. **Push on the cover's left and right sides.**

Figure 5-4 Pushing Down on the Cover's Sides, Back Panel View



4. **Guide the cover downwards so that the plastic tab snaps the cover to the back panel.**

5. **Using a screwdriver, tighten the screw on the back panel to the cover.**

Installing Memory Modules

About UltraStation 1E+ DSIMMs Memory Module Installation

UltraStation 1E+ system units are equipped with a minimum of 32 MB of random access memory (RAM). Physically, RAM chips are grouped together in single inline memory modules. The acronym "DSIMM" refers to the type of memory module used with the UltraStation 1E+ and stands for:

- Dynamic random access memory (DRAM)
- Single
- Inline
- Memory
- Module

Each DSIMM contains 16, 32 or 64 MB of memory and plugs into a memory slot located on the main-logic board of the system unit. Always two modules at adjacent locations have to be installed. Additional DSIMMs may be added to your system unit as needed in 32 (2x16), 64 (2x32) or 128 (2x64) MB increments, up to a maximum of 8 DSIMMs (512 MB).

DSIMMs installed in your UltraStation 1E+ must have been specifically designed to operate it. Do not remove DSIMMs from a different workstation except SPARC Station 20 compatible ones and install them in a UltraStation 1E+.

How to Turn the Power Off

To turn the power off to your system:

1. **Save all your work.**
   See your software documentation for instructions on ending a work session and saving your files. If you do not save your work, you could lose it when you switch off the power.

2. **Return to the operating system environment.**
   If you are in a windowing environment, exit from it and wait for the system prompt to appear. See the paragraph "Powering Off the System" in Chapter 2 "Installing the UltraStation 1E+".

3. **Turn off the power in sequence to:**

   a. **Monitor**

   b. **External drive unit (if any)**

   c. **UltraStation 1E+ system unit**

Caution – Do not disconnect the power cord from the power outlet on your system or from the wall outlet. This connection provides the ground path necessary to remove and install the printed circuit board and components without damaging them with static electricity.

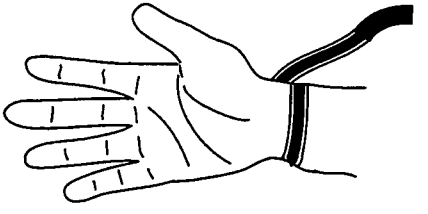
▼ Opening the System Unit

Refer to the the paragraph "Opening and Closing the System Unit" in this chapter for more information.

Attaching the Wrist Strap

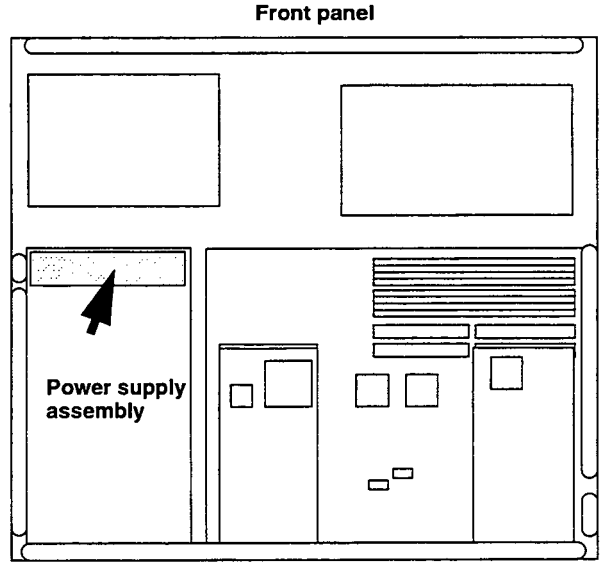
To attach the wrist strap, follow these steps:

1. **Unwrap the first two folds of the wrist strap. Wrap the adhesive side firmly against your wrist.**



2. **Peel the linter from the copper foil at the opposite end of the wrist strap.**

3. **Attach the copper end of the wrist strap to the top of the metal casing of the power supply.**



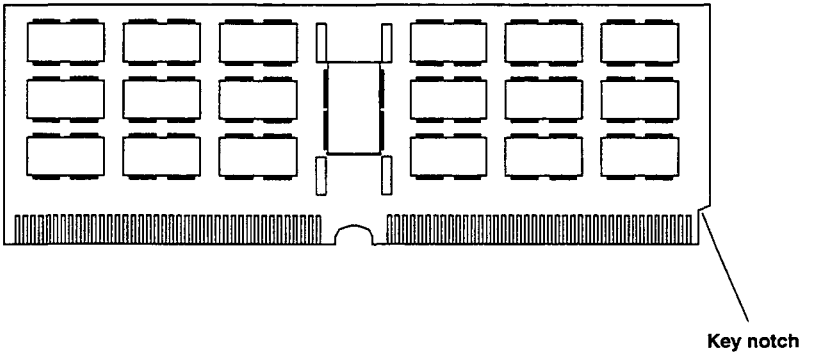
Identifying DSIMMs

A DSIMM comes in special packaging to protect it from harmful electrical charges.

Before you attempt to install a new DSIMM or replace a defective one, make sure that you have the right item. Each DSIMM consists of a small card mounted with 18 horizontally-mounted chips on each side (36 chips, total). The part of the card that plugs into the memory slot has "gold fingers" - a scalloped edge with a conductive surface.

Figure 5-5 shows an UltraStation 1E+ DSIMM module. Watch the key notch when installing the DSIMM module.

Figure 5-5 UltraStation 1E+ DSIMM, Back Panel View

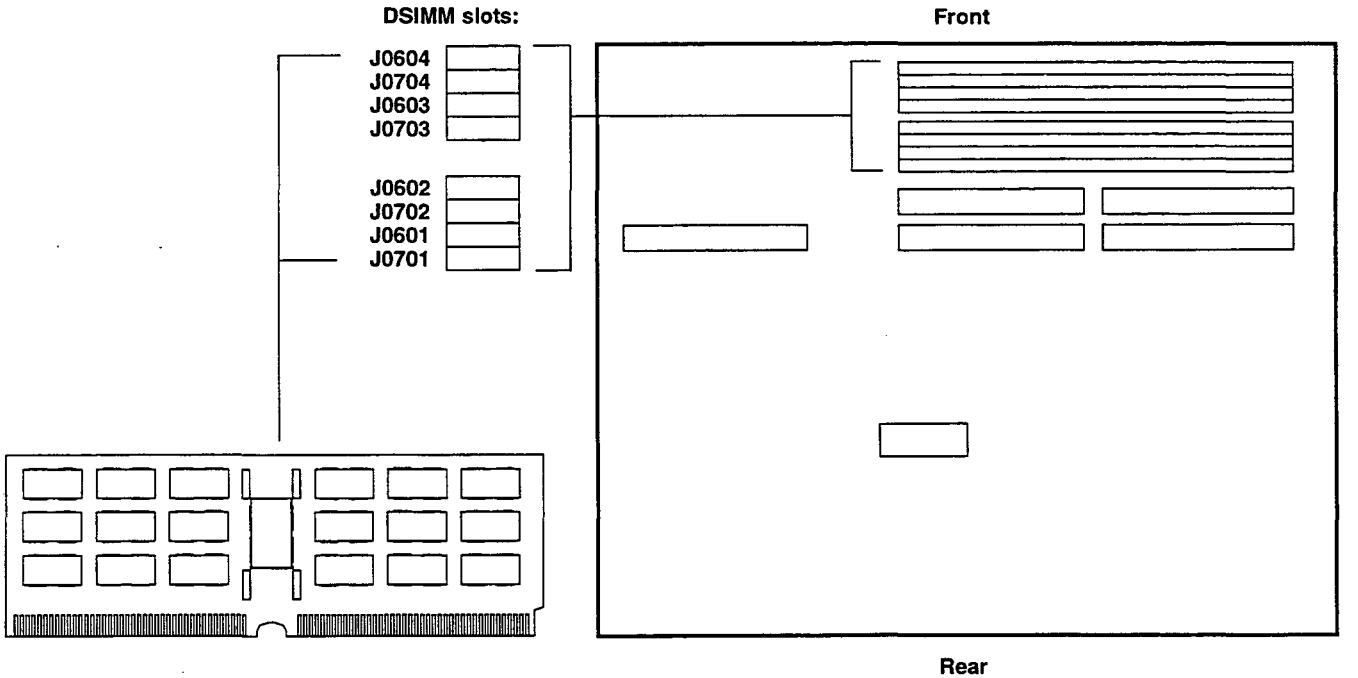


Inserting a DSIMM

▼ To install a DSIMM Module:

1. **Locate the DSIMM module slots on the main-logic board.**

Figure 5-6 DSIMM Slot Locations on Main-Logic Board



2. **Open the protective packaging and take out the DSIMM.**
3. **Place the DSIMM on the static shielding bag.**
4. **See Table 5-1 for the proper sequence.**

Table 5-1 DSIMM Arrangement

Bank	Slot
1	J0701
1	J0601
2	J0702
2	J0602
3	J0703
3	J0603
4	J0704
4	J0604

Note – Always two slots of a bank must be used.
Both slots of a bank must be the same size (16 MB, 32 MB, 64 MB) SIMMs.

5. **Holding a DSIMM at its edges the key notch must point to the lever, place it into the DSIMM plastic guides. See Figure 5-5 for proper DSIMM orientation. Be sure that the key notch is as shown in Figure 5-6.**

6. **Place the heel of each hand on each side of the DSIMM, and press firmly with both hands on the module until the DSIMM snaps into place.**

Figure 5-7 Heel of Each Hand

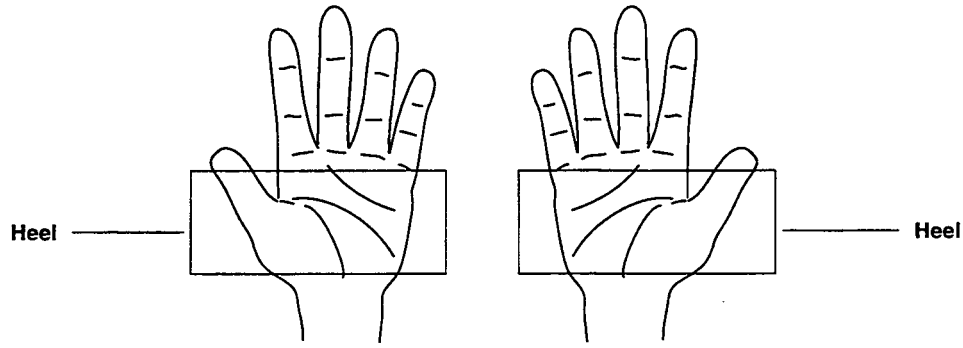
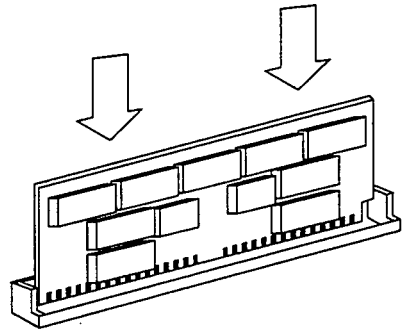


Figure 5-8 Inserting the Module



Warning – Before powering on your system again, be sure to replace the top cover using the procedure described in the paragraph "Opening and Closing the System Unit". It is not safe to operate the UltraStation 1E+ without its top cover in place.

Removing DSIMMs

Perform the following procedures before removing a DSIMM:

- Halting the System
- Opening the System Unit
- Attaching the Wrist Wrap

▼ Removal Procedure

Each DSIMM is mechanically removed by first pulling on an ejector lever, lifting one corner of the DSIMM and then the other, until the DSIMM is completely removed. To remove a DSIMM from a UltraStation 1E+:

1. **Inspect both ends of the DSIMM socket.**
   You will find a small ejector lever on the side towards to power supply assembly. Pull the lever in the opposite direction of the DSIMM you wish to remove.

Figure 5-9 Using the DSIMM Ejector Lever

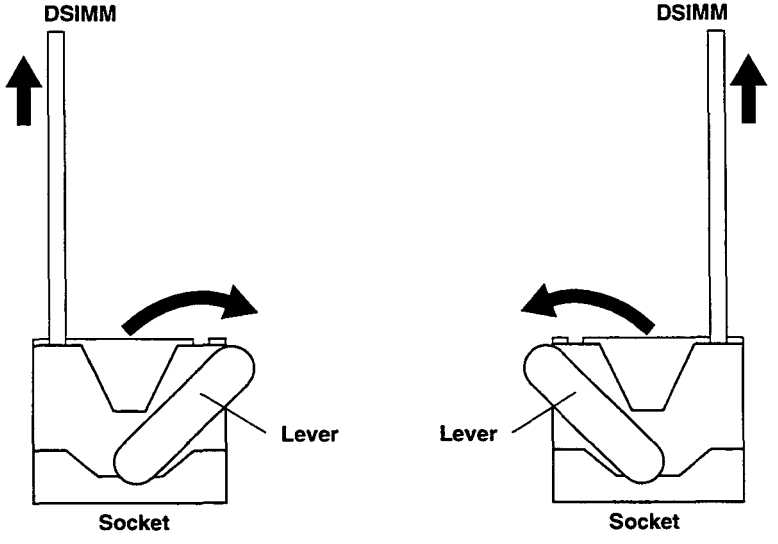
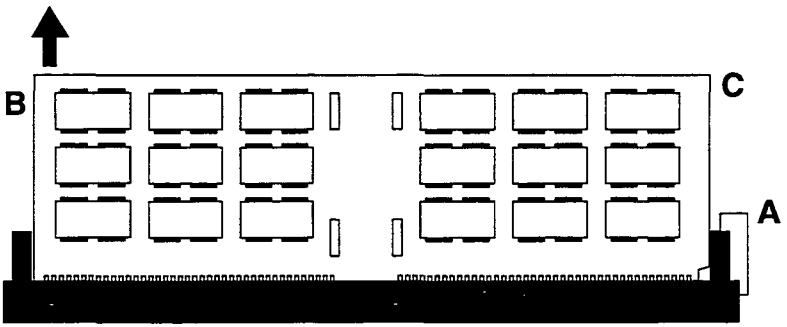


Figure 5-10 Removing a DSIMM



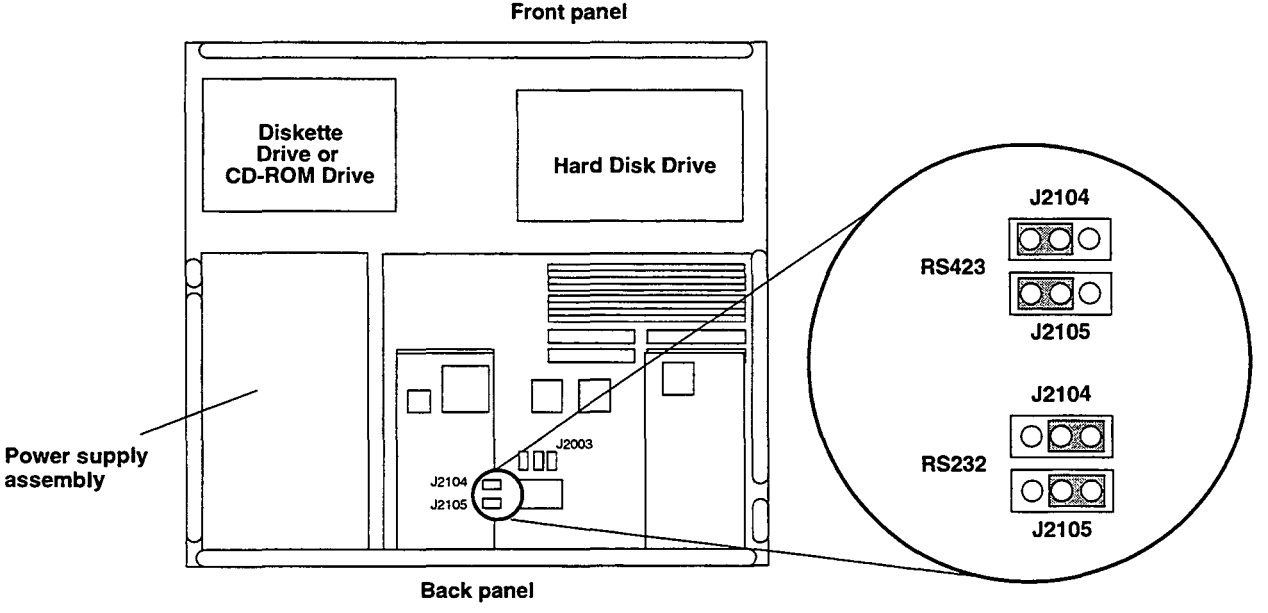
2. **Pull the ejection lever (A) in the opposite direction of the DSIMM you want to eject.**
3. **Pull up on the other side (B) of the DSIMM.**
4. **Pull up on both corners (B and C) of the DSIMM until the board clears the socket.**
5. **Close the system unit using the procedure described in the paragraph "Opening and Closing the System Unit".**

Changing the Serial Port Jumpers

▼ To change the serial port mode jumpers for both ports A and B on the main logic board to RS232 mode:

1. Open the system unit.
2. Locate the jumpers on the main logic board.

Figure 5-11 Locating the Jumpers



3. Change the jumpers on both J2104 and J2105.
4. Close the system unit (refer to the paragraph "Opening and Closing the System Unit" in this chapter).

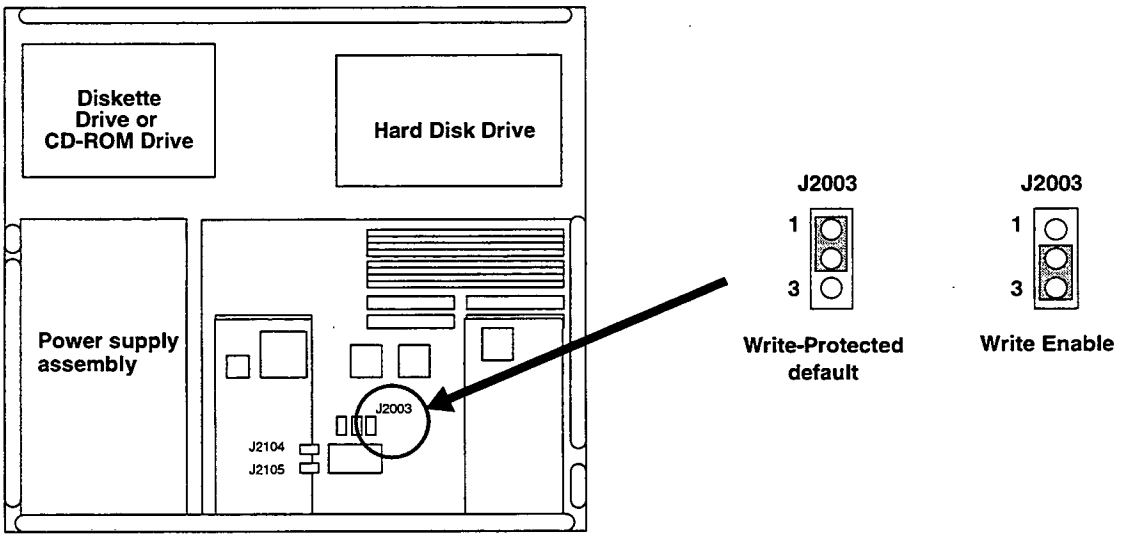
Updating Open Boot Prom (OBP)

The UltraStation 1E+ is equipped with an Electrically Erasable EPROM (EEPROM). This allows you to update the Open Boot PROM software.

In order to do so you need to have access to a new revision of the Open Boot PROM via a CD-ROM or network and you have to enable writing to the EEPROM.

▼ Enable writing to the EEPROM

1. **Open the system unit.**
2. **Locate the jumper on the main logic board.**



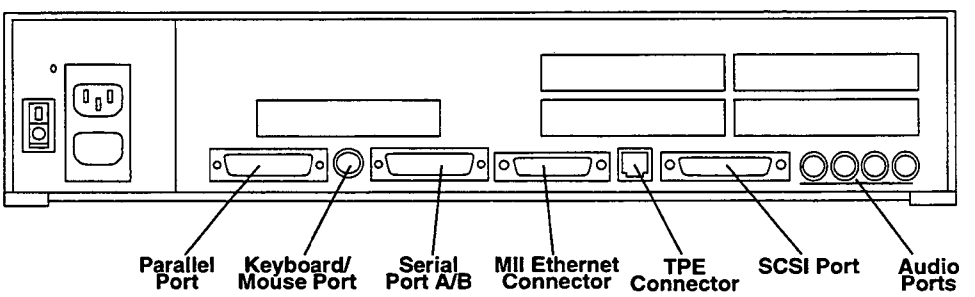
3. **Change the position of jumper J2003.**
4. **Update the software according to the manual.**
   To update the software, follow instructions of the manual that comes with the new OBP revision CD-ROM.
5. **Change the position of jumper J2003 back to the write-protected position.**
6. **Close the system unit.**

6 *Installing External Devices*

This chapter describes the I/O (input/output) ports contained in the UltraStation 1E+ rear panel. For specific instructions for installing an external device, such as a printer, terminal, or external storage device, refer to the owner's manual for the device. The rear panel I/O ports covered in this chapter include:

- Audio ports
- Bidirectional parallel port (BPP)
- AUI or twisted-pair Ethernet ports
- Serial port for serial A / B cable
- SCSI port
- Keyboard and mouse port

Figure 6-1 UltraStation 1E+ I/O Ports



Audio Ports

System will include the Codec required for audio functionality. A total of four external connectors are supplied: line input connector, line output connector, a headphone connector, and a stereo microphone connector. All connectors are 35 mm mini-stereo connectors. Line in and line out support 16 bit CD quality stereo.

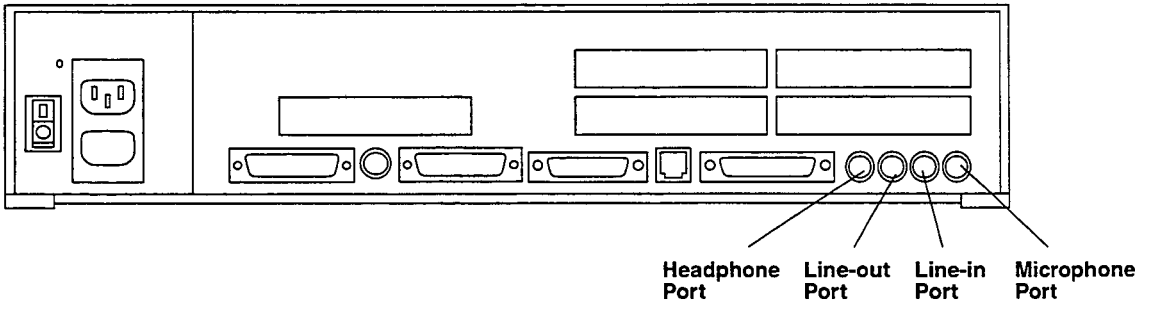
Audio sources can be: line-in connector, (stereo/mono) microphone, digital audio (disk/network).

Audio can be output to: speaker, headphones, line-out or digital audio (to disk/network).

Powered external speakers are required to interface with line-out.
Specs are:

- Line-in: 10.2 Kohm input impedance
- Line-out: 10 Kohm minimum recommended
- Microphone: Electric (power through connector) stereo or mono
- Headphone: 16 ohms minimum, 600 ohms recommended

Figure 6-2 Audio Ports



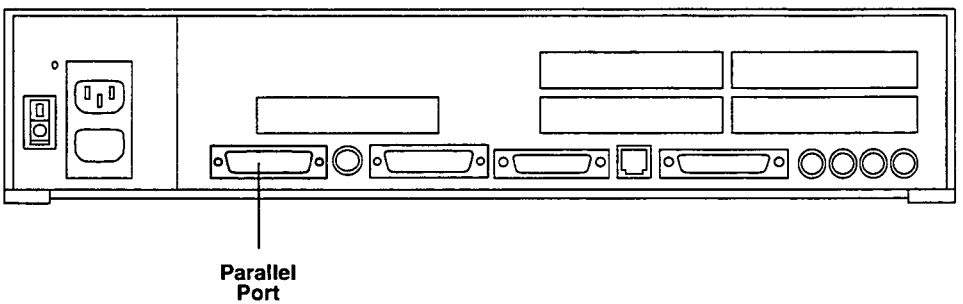
Need more information? – For more details, see "Audio Tool" in the Open Windows User Manual.

Bidirectional Parallel Port

The parallel port on the UltraStation 1E+ rear panel is bidirectional and, therefore, supports standard external parallel devices, such as a printer (an output device) or a scanner (an input device). This interface will support up to 4 MB/s and is "Centronics compatible"

To connect a parallel device to the parallel port, you will need a parallel cable. Refer to the owner's manual for the device for system configuration instructions. The rear panel parallel port location is shown in Figure 6-3.

Figure 6-3 Parallel Port



▼ To connect a parallel device:

1. **Connect the DB-25 connector end of the parallel cable to the rear panel parallel port.**
2. **Connect the other end of the parallel cable to the parallel device.**
   Check the device manual for configuration instructions, if necessary.

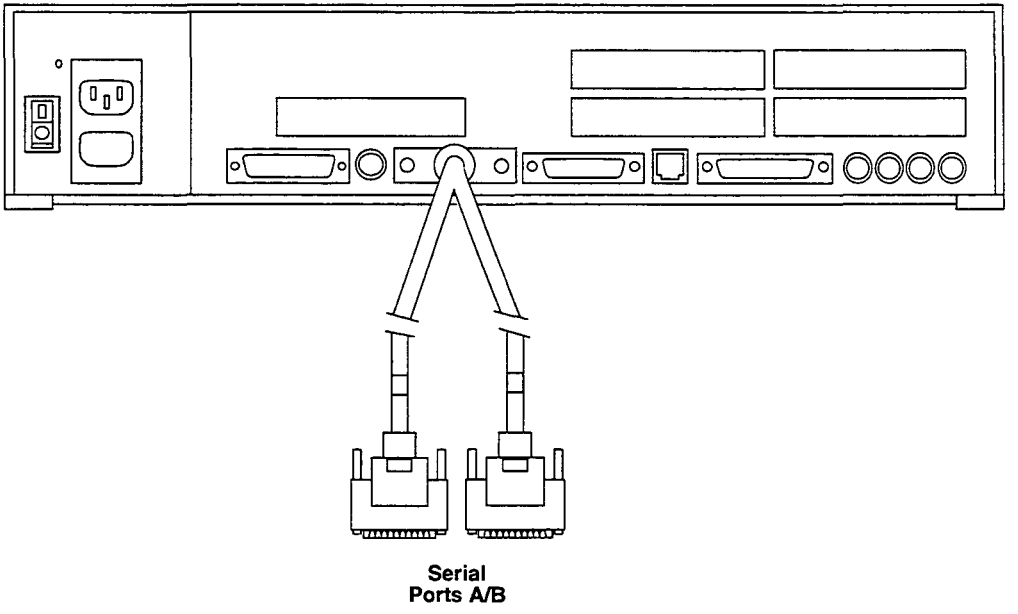
   Use device /dev/bpp0 in Solaris Admin Tool.

Serial Ports

The UltraStation 1E+ rear panel contains two serial ports The serial ports are shown in Figure 6-4.

Both serial ports support synchronous communication. The maximum baud rate is 64 Kbaud synchronous and 76.8 Kbaud asynchronous.
RS232 and RS423 standards are supported via jumper setting. Default configuration is RS423. Connection is via one DB-25 standard receptacles and a split cable which is supplied with the workstation.

Figure 6-4 Serial Ports

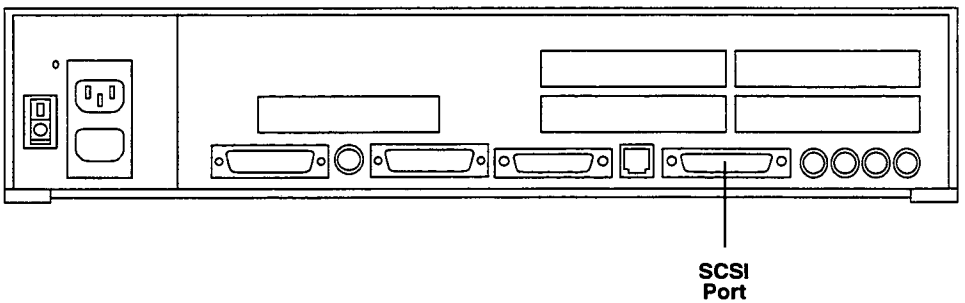


SCSI Port

The UltraStation 1E+ provides a 20 MB/s SCSI-II interface. The 16 bit single-ended SCSI-II bus uses a 68-pin high density connector. All standard external Fast-Wide (16-bit) and narrow (8-bit) SCSI-II (Small Computer System Interface) devices such as hard disk drives, tape drives and CD-ROM drives are supported.

SCSI devices connected to the UltraStation 1E+ can be daisy-chained or connected directly to the SCSI port. In a daisy-chain, a cable connects the first device to a second device and is repeated for additional devices. A maximum of twelve external SCSI devices can be connected. Always the last one in a daisy-chain has to be active terminated. The external SCSI port is internally terminated if no external SCSI cable is connected. Refer to the annex for more information.

Figure 6-5 SCSI Port



7 Configuring the System

The next step in the installation is to configure the operating system. There are two ways to set up the UltraStation 1E+ in a network or as a standalone.

Need more information? – For more information about installing a system in a network or as a standalone, see "Planning the Workstation Site" in Chapter 1.

▼ To set up a system on the network:

1. **Consult your system administrator to do the following:**
   - Set up a user account and password on the server
   - Agree on a hostname
   - Obtain an Internet address
2. **Set up your system configuration with the instructions in "Configuring Your Workstation" in *Getting Started with Solaris*.**

Need more information? – More information about network addresses domain names, and adding systems to a network can be found in "Connecting to the Network" in *Getting Started with Solaris*.

▼ To set up a standalone system:

- Set up your system configuration with the instructions in "Configuring Your Workstation" in *Getting Started with Solaris.*

A

Back Panel Connector Specification

Table A-1 Back Panel Seral Connector Specifications

Pin	Circuit	Signal	Direction	Description
1	none	none	none	Not connected
2	BA	TD	output	Transmit Data: Port A.
3	BB	RD	input	Receive Data: Port A.
4	CA	RTS	output	Request To Send: Port A.
5	CB	CTS	input	Clear To Send: Port A.
6	CC	DSR	input	Data Set Ready: Port A.
7	AB	SG	none	Signal Ground
8	CF	DCD	input/output	Data Carrier Detect: Port A.
9	none	none	none	Not connected
10	none	none	none	Not connected
11	SCD	SDTR	input	Secondary Data Terminal Ready: Port B.
12	SCF	SDCD	input	Secondary Data Carrier Detect: Port B.
13	SCB	SCTS	input	Secondary Clear To Send: Port B.
14	SBA	STD	output	Secondary Transmit Data: Port B.
15	DB	TC	input	Transmit Clock: Port A, DCE source.
16	SBB	SRD	input	Secondary Receive Data: Port B.
17	DD	RC	input	Receive Clock: Port A.
18	SDB	STC	input	Secondary Transmit Clock: Port B.
19	SCA	SRTS	output	Secondary Request To Send: Port B.

Pin	Circuit	Signal	Direction	Description
20	CD	DTR	output	Data Terminal Ready: Port A.
21	none	none	none	Not connected
22	none	none	none	Not connected
23	none	none	none	Not connected
24	DA	TC	output	Transmit Clock: Port A, DTE source
25	DA	TC	output	Transmit Clock: Port B, DTE source

Figure A¬1 DB25 Female

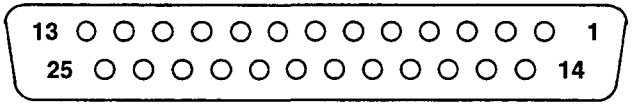


Table A-2 Parallel Port

Pin	Signal	I/O	Level	Description
1	DataStrobe*	I/O	24 ma OC	Data Valid Strobe
2	Data Bit 0	I/O	24 ma OC	Data Bit
3	Data Bit 1	I/O	24 ma OC	Data Bit
4	Data Bit 2	I/O	24 ma OC	Data Bit
5	Data Bit 3	I/O	24 ma OC	Data Bit
6	Data Bit 4	I/O	24 ma OC	Data Bit
7	Data Bit 5	I/O	24 ma OC	Data Bit
8	Data Bit 6	I/O	24 ma OC	Data Bit
9	Data Bit 7	I/O	24 ma OC	Data Bit
10	Ack*	I	TTL	Data Acknowledge
11	Busy	I	TTL	Busy
12	PE	I	TTL	Paper Error
13	Select	I	TTL	Select
14	AutoFeed*	O	24 ma TTL	Auto Feed
15	Error*	I	TTL	Error
16	Reset*	O	24 ma TTL	Initialize
17	SlctIn*	O	24 ma TTL	Select In
18 - 25	Shield		GND	

Figure A¬2 DB25 Female

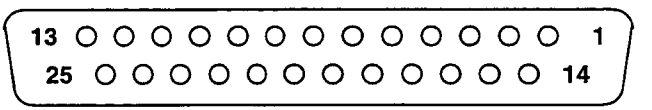


Table A-3 MII Ethernet Port

Pin	Signal	I/O	Level	Description
1	+5V	O	VCC	
2	MDIO	I/O	TTL	Management Device I/O
3	MDC	O	TTL	Management Device Clock
4	RXD3	I	TTL	Receive Data 3
5	RXD2	I	TTL	Receive Data 2
6	RXD1	I	TTL	Receive Data 1
7	RXD0	I	TTL	Receive Data 0
8	RX_DV	I	TTL	Receive Data Valid
9	RX_CLK	I	TTL	Receive Clock
10	RX_ER	I	TTL	Receive Error
11	TX_ER	I/O	TTL	Transmit Error
12	TX_CLK	I	TTL	Transmit Clock
13	TX_EN	O	TTL	Transmit Output
14	TXD0	O	TTL	Transmit Data 0
15	TXD1	O	TTL	Transmit Data 1
16	TXD2	O	TTL	Transmit Data 2
17	TXD3	O	TTL	Transmit Data 3
18	COL	I	TTL	Transmit Collision Detected
19	CRC	I	TTL	Carrier Sense
20, 21	+5V	O		
22 .. 39	GND		GND	
40	+5V	O		

Figure A¬3 DB40 Female

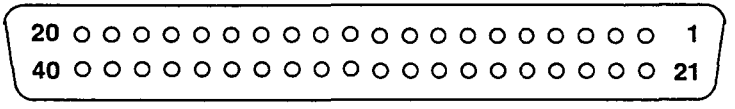


Table A-4 Twisted-Pair Ethernet

Pin	Signal	I/O	Level	Description
1	TPO+	O	Analog	Differential Twisted-Pair Transmit Data
2	TPO-	O	Analog	Differential Twisted-Pair Transmit Data
3	TPI*	I	Analog	Differential Twisted-Pair Receive Data
4-5	N.C.			
6	TPI-	I	Analog	Differential Twisted-Pair Receive Data
7-8	N.C.			

Figure A¬4 RJ45, Female

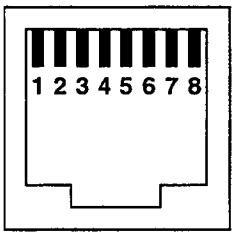


Table A-5 Keyboard/Mouse Port

Pin	Signal	I/O	Level	Description
1	Ground		GND	
2	Ground		GND	
3	+5 VDC	O	VCC	
4	Mouse In	I	TTL	Input from Mouse
5	KeyBd Out	O	TTL	Output from Keyboard
6	Keybd In	I	TTL	Input from Keyboard
7	PowerOn*	I	TTL	
8	Shield		Shield	

Figure A¬5 Keyboard/Mouse Port

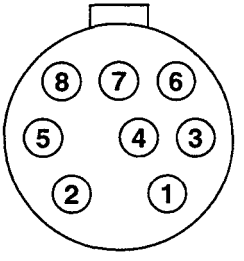
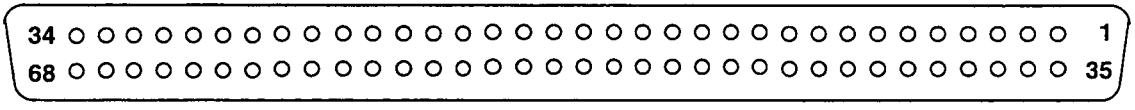


Table A-6 SCSI Connector

Pin	Signal	I/O	Level	Description
1,2	GROUND		GND	
3	TERMWDIS	I	TTL	Open: High Byte terminated GND: High Byte not terminated
4-16	GROUND		GND	
17	TERMPWR	O	+5V	Termination Voltage
18	TERMPWR	O	+5V	Termination Voltage
19				Open
20 - 34	GROUND		GND	
35	D(12)-	I/O	TTL	SCSI Data Bit 12
36	D(13)-	I/O	TTL	SCSI Data Bit 13
37	D(14)-	I/O	TTL	SCSI Data Bit 14
38	D(15)-	I/O	TTL	SCSI Data Bit 15
39	DP(1)-	I/O	TTL	SCSI Data Parity 1
40	D(0)-	I/O	TTL	SCSI Data Bit 0
41	D(1)-	I/O	TTL	SCSI Data Bit 1
42	D(2)-	I/O	TTL	SCSI Data Bit 2
43	D(3)-	I/O	TTL	SCSI Data Bit 3
44	D(4)-	I/O	TTL	SCSI Data Bit 4
45	D(5)-	I/O	TTL	SCSI Data Bit 5
46	D(6)-	I/O	TTL	SCSI Data Bit 6
47	D(7)-	I/O	TTL	SCSI Data Bit 7
48	DP	I/O	TTL	SCSI Data Parity
49	GROUND		GND	
50	TERM_DIS	I	TTL	Open: Low Byte terminated GND: Low Byte not terminated
51	TERMPWR	O	+5V	Termination Voltage
52	TERMPWR		+5V	Termination Voltage
53				Open
54	GROUND		GND	
55	ATN-	I/O	TTL	Attention

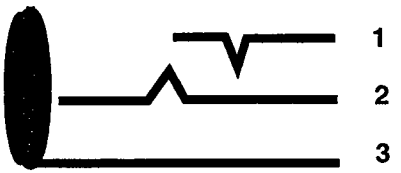
Pin	Signal	I/O	Level	Description
56	GROUND		GND	
57	BSY-	I/O	TTL	Busy
58	ACK-	I/O	TTL	Acknowledge
59	RST-	I/O	TTL	Reset
60	MSG-	I/O	TTL	Message
61	SEL-	I/O	TTL	Select
62	C/D-	I/O	TTL	Control/Data
63	REQ-	I/O	TTL	Request
64	I/O-	I/O	TTL	Input/Output
65	D(8)-	I/O	TTL	SCSI Data Bit 8
66	D(9)-	I/O	TTL	SCSI Data Bit 9
67	D(10)-	I/O	TTL	SCSI Data Bit 10
68	D(11)-	I/O	TTL	SCSI Data Bit 11

Figure A¬6 SCSI Port



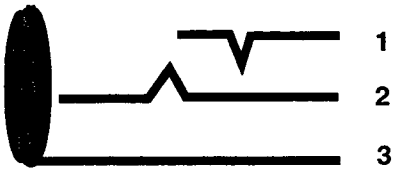
Audio Connector Specification

Table A-7 Line Input



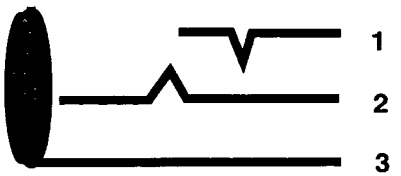
1. GND
2. Audio Input (Left)
3. Audio Input (Right)

Table A-8 Line Output



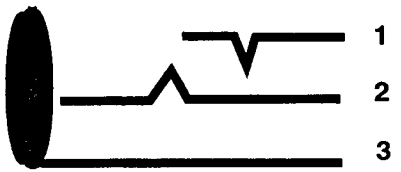
1. Audio Output (Left)
2. Audio Output (Right)
3. GND

Table A-9 Microphone Input



1. Mic Input (Left)
2. Mic Input (Right)
3. GND

Table A-10 Headphone Output



1. Line Output(Left)
2. Line Output(Right)
3. GND

B

Back Panel Connector Specification

The UltraStation 1E+ has one wide-SCSI-2 interface on the motherboard with an internal and an external connector .

Internally

Internally a maximum of two Wide-SCSI harddisks and a narrow CD-ROM (DAT) drive can be mounted, depending on the workstation you ordered.

In any case there is an internal SCSI termination at one end of the SCSI bus cable. All internally installed devices (harddisks, CD-ROM, etc.) must not be terminated.

Externally

The external 68-pin HD SCSI-2 connector is internally terminated. The termination is disabled when a SCSI cable is plugged into the connector. When a narrow SCSI (50-pin) cable is connected, the upper 8 data bits will stay terminated internally. When a Wide SCSI (68-pin) cable is connected, the internal termination is completely disabled. If the SCSI bus is not properly terminated with an active terminator at the very end of the external SCSI bus, the workstation will not boot at all.

The SCSI IDs are used as follows:

Table B-1 SCSI IDs

ID	narrow/wide	Reserved for	Location
15	wide	-	internal/external
14 .. 8	wide	-	internal/external
7	wide/narrow	Motherboard	internal
6	wide/narrow	CD ROM	internal (external)
5	wide/narrow	-	internal/external
4	wide/narrow	-	internal/external
3	wide/narrow	-	internal/external
2	wide/narrow	-	internal/external
1	wide/narrow	-	internal/external
0	wide	default boot disk	internal

If devices do not appear on the SCSI bus after a reboot with the `boot -r` command, it is possible to test the SCSI devices. Shut down the system and use the Open Boot-Prom command:

```
ok    probe-scsi <return>
```

You should now see all connected devices with their target ID number.