Netra™ t1
User and Administration Guide

Sun Microsystems, Inc.
901 San Antonio Road
Palo Alto, CA 94303
U.S.A. 650-960-1300

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Preface

This manual tells you how to install, maintain and manage a Netra t1 Model 100/105 server.

How This Book Is Organized

Part I "Installation and Configuration"

Chapter 1 "Before You Begin"
Introduces the Netra t1 Model 100/105 server and tells you what tools to use to install the system. It also describes the equipment's tolerance of different environmental conditions.

Chapter 2 "Operating Power and Cooling"
Provides information about the power and cooling requirements for the Netra t1.

Chapter 3 "Using DC Power"
Tells you the site requirements for using DC power, and also tells you how to assemble the DC input power cable.

Chapter 4 "Installing Hardware Option Modules"
Tells you how to install optional (hot-pluggable) hard disk drives. The chapter also tells you how to open the Netra t1, how to identify its component parts, and how to install a CD-ROM drive.

Chapter 5 "Installing the Netra t1 into a Rack"
Tells you how to install the Netra t1 into different types of rack.

Chapter 6 "Connecting the Cables"
Tells you how to cable up and set up serial connections to the Netra t1.

Chapter 7 “Powering Up the Netra t1”
Tells you how to perform the initial power up and configuration of the Netra t1.

Chapter 8 “Using Different Versions of Solaris”
Tells you how to install different versions of Solaris.

Part II “Maintenance and Management”

Chapter 9 “Monitoring and Managing the System”
Tells you how to use the ‘Lights-Out’ Management (LOM) facility to power the system on and off or reset it remotely and how to inspect status information about the system’s fans and power supply. The chapter also tells you how to configure the LOM facility to restart the system automatically in the event of a lock-up.

Chapter 10 “Maintaining the System”
Lists the Field Replaceable Units and optional accessories that you might want to order for the Netra t1 during its life-time. If you ever need to replace an entire Netra t1 system, the chapter also tells you how to retain the configuration information for one system so that it can be transferred to another.

Chapter 11 “Troubleshooting”
Lists some problems that you might encounter setting up or using the Netra t1 system and tells you how to solve them.

Part III “Appendices”

Appendix A “Installing Additional Memory”
Tells you how to install more memory into the Netra t1.

Appendix B “Installing a PCI Card”
Tells you now to install a PCI card into the Netra t1.

Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- AnswerBook™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

Typographic Conventions

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

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#
LOM shell	lom>

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Safety Precautions

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

- Follow all cautions and instructions marked on the equipment.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects can produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this manual:

Caution – There is a risk of personal injury and equipment damage. Follow the instructions.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for the regulatory compliance of a modified product.

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

Caution – If your Netra t1 system is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may exceed the room ambient temperature. Ensure that rack environment ambient temperature does not exceed 40 degrees. The system will tolerate ambient temperatures of up to 55 degrees, but these temperatures must not persist for more than 96 hours.

Caution – Mounting of the equipment in a rack or cabinet should be such that a hazardous condition is not created due to uneven mechanical loading or weight distribution.

Caution – Ensure that the connection of multiple system units to the circuit does not overload the the supply overcurrent protection or supply wiring. Consider the Sun agency label electrical ratings when determining the correct branch circuit rating for your installation.

Caution – All supply connections, wiring, wire protection, and wire routing must be made in accordance with applicable sections and requirements of national electrical code and local electrical authorities.

PART I Installation and Configuration

CHAPTER 1

Before You Begin

This chapter contains the following sections:

- "The Netra t1 Model 100/105 System" on page 2
- "The Contents of the Ship Kit" on page 3
- "Netra t1 Option Modules Available" on page 3
- "The Tools You Need for Installation" on page 4
- "Your Operating Environment" on page 4
- "Choosing Between a Rack and a Cabinet" on page 5

What's Next?

When you have read this chapter introducing the Netra t1, go to Chapter 2 to find out how to calculate the power and cooling requirements for your system.

The Netra t1 Model 100/105 System

The Netra t1 Model 100/105 computer system is a single-processor server designed primarily for use by telecommunications carriers and internet service providers.

The Model 100 is powered by –48VDC/–60VDC supplies. The Model 105 is powered by an AC supply. This is the only difference between the two models.

The Netra t1 has the following features:

- Rack-mounting enclosure with single –48VDC/–60VDC (Netra t1 Model 100) or AC (Netra t1 Model 105) power supply
- Support for UltraSPARCIIi 360 MHz processor with 1Mbyte cache or UltraSPARCIIi 440 MHz processor with 2 Mbyte cache
- Sockets accepting 64, 256 and 512 Mbyte memory cards in single-board, 2-stack, or 4-stack configurations (giving a maximum of 1 Gbyte of memory)
- One short (176 mm) 33 MHz, 32 bit, 5VDC PCI card slot
- Two 10/100 Mbps RJ-45 Ethernet ports
- Console/Lights Out Management RJ-45 serial port
- Second RJ-45 serial port
- Support for up to two low-profile, 3.5 inch Fast-20 (UltraSCSI) disks
- Low-profile ATAPI CD-ROM drive (this is an orderable hardware option, part number: 595-5317-01)
- External Fast-20 (UltraSCSI) 68-pin port

The Netra t1 is designed for rack mounting. Its components are housed in a casing with the following dimensions:

- Height: 44 mm (1.73 inches)
- Width: 440 mm (17.3 inches)
- Depth: 488.95 mm (19.25 inches)
- Weight (when all option modules are installed): 10 kg (22 lb)

The Contents of the Ship Kit

TABLE 1-1 Contents of the Ship Kit

Part Number	Item	Quantity
340-5819-02	19-inch rack mounting brackets	4
340-6151-01	Cable management bracket	1
540-4362-01	Sun slide rail	2
530-2093-01	RJ45-RJ45 patch cable for Ethernet or serial connection	2
530-2889-02	RJ45-DB25 adapter	1
565-1644-01	DC connector kit	1
565-1645-01	10-32 UNF Sun rack mounting screw kit	1
704-6914-10	Solaris Operating Environment Installation CD (9/99 or later)	1
704-7081-10	Bonus CD	1
704-7088-10	iPlanet Web CD	1
806-3947-10	iPlanet manual	1
806-4707-10	Netra t1 System User and Administration Guide	1
806-2274-15	Release Notes	1

Netra t1 Option Modules Available

Sun offer a range of hard disk drives, PCI network interface cards, CD-ROM drives, and memory cards for the Netra t1 Model 100/105. For a full list of the option modules available, see Chapter 10.

The Tools You Need for Installation

- An 8mm wrench (for assembling the rack mounting)
- A small flat-head screwdriver (for installing hard disks)
- An ESD pad and an anti-static wrist strap and earthing point (to protect the components of the system if you need to install any hardware options)
- A No 2 Phillips screwdriver (and a No. 1 Phillips screwdriver if you are installing additional memory)
- A Thomas & Betts two-hole lug (part number: 54204-UB) and a Thomas & Betts crimping tool (part number: TBM 5-S) (you will need these tools if you need to use a two-hole ground connection; see Chapter 3)

Your Operating Environment

The System's Tolerance of Different Environmental Conditions

You can operate and store the system safely in the following conditions:

- Ambient temperature
  - Operating: 0˚C to 40˚C (temporary operation outside these limits is permitted for a maximum of 96 hours within the range –5˚C to 55˚C)
  - Storage: –40˚C to 70˚C
- Temperature variation
  - Operating: 30˚C/hr maximum
  - Storage: 30˚C/hr maximum
- Relative humidity
  - Operating: 5% to 85% (non-condensing)
  - Storage: 10% to 95% (non-condensing)
- Altitude
  - Operating: –300 m to +3000 m
  - Storage: –300 m to +12000 m
- Earthquake
  The system conforms to the NEBS requirements for earthquake zone 4

Acoustic Noise Generated by the Netra t1

The system generates less than 60 dBA at a distance of 600 mm and a height of 1500 mm (operating in an ambient temperature of 25˚C).

Environmental Compliance Information

- NEBS environmental criteria
  The system conforms to GR-63-CORE issue 1, October 1995
- Electro-magnetic compatibility
  - Immunity: The system conforms to GR-1089-CORE and EN50082-1
  - Emissions: The system conforms to GR-1089-CORE, EN55022 Class A and FCC Class A
- Safety
  The system conforms to UL 1950 (3rd edition), EN60950, GR-1089-CORE

Choosing Between a Rack and a Cabinet

Netra t1 servers can be installed in either racks or cabinets. Factors that may influence your decision include:

- Security
  If other people have access to the room in which your Netra systems are located, you can increase security by locking the systems in a cabinet.
- Thermal issues
  Cabinets often require additional fans, because the systems you install in them are generating heat in an enclosed space. Two-post racks, however, may require no special cooling systems.
- Flooring
  Two-post telco relay racks are designed so that cables can be run overhead. Cabinets often require cables to be run under the floor.

What's Next?

When you have read this chapter, go to Chapter 2 to find out how to calculate the power and cooling requirements for your system.

CHAPTER 2

Operating Power and Cooling

The chapter contains the following sections:

- "Operating Power Statistics" on page 8
- "Calculating the Power Requirements for your Netra t1" on page 9
- "Calculating the Heat To Be Dissipated" on page 10

What's Next?

When you have used this chapter to calculate the power and cooling requirements for your Netra t1 system, go to Chapter 3 which tells you how to assemble the DC input power cables for the Netra t1 Model 100, or, if you are installing a Model 105 system, go straight to Chapter 4 to find out how to install the optional hardware modules available for the Netra t1.

Operating Power Statistics

TABLE 2-1 Operating Power Statistics for the Netra t1 Model 100 and Model 105

Description	Netra t1 Model 100 (DC power)	Netra t1 Model 105 (AC power)
Maximum Operating Current	4A @ (–40VDC)	2A @ 90 VAC
Typical Operating Current	See “Calculating the Power Requirements for your Netra t1” on page 9	See “Calculating the Power Requirements for your Netra t1” on page 9
Maximum In-rush Current	20A peak (upon a hot or cold start*)	100A peak (upon a cold start*)
Operating Input Voltage Range	–40 to –75 VDC	90-264 V_{rms}
Voltage Frequency Range	DC	47-63 Hz
Power Factor	Not Applicable	0.9 to 0.99
Maximum Volt-Ampere Rating	120 VA	120 VA
BTU rating	368 BTU**	368 BTU**

* For both models, the in-rush current decays to the normal operating current in less than 200 msecs. For the AC model, the in-rush current of 100 A lasts for 2 msecs during a cold start or during a warm start performed 60 seconds (or longer) after the AC was removed.
** This BTU assumes a system fully loaded with hardware option modules.

Caution – The power supply on the Model 105 continues to regulate all outputs for at least 20 msecs after AC power is removed. On the Model 100, the power supply continues to regulate all outputs for at least 5 msecs after DC power is removed.

Note – Logic ground and chassis ground are connected together internally within the system.

Note – Power from the standby output is available whenever input power is connected.

Calculating the Power Requirements for your Netra t1

A Netra t1 system containing two disk drives has an estimated power requirement of approximately 1 amp.

TABLE 2-2 shows the estimated power consumed by the individual components in a fully powered system (that is, in a system with a Power Supply Unit (PSU) operating at 100% efficiency). However, when you are calculating the power requirements for your system, you must allow for 65% PSU efficiency. To perform this calculation, add the figures (from the third column of TABLE 2-2) for each component installed in the system. Then divide the result by 0.65. Below are two examples.

TABLE 2-2 Estimated Power Consumption of the Components of the Netra t1

Component		Estimated Power Consumption (at 100% PSU efficiency)
Base system	360 MHz	34.3 W
	440 MHz	36.3 W
Memory (per DIMM)		0.21 W per 64 Mbyte
Disk drive	9 Gbyte / 7200 rpm	11.0 W
	18 Gbyte / 10000 rpm	13.8 W
CD-ROM		3.2 W
PCI card		Variable (max 25 W)

Example A

The power requirement for a Netra t1 system operating at 65% PSU efficiency and containing:

- the 440 MHz CPU
- 512 Mbyte RAM
- two 9 Gbyte disk drives

is calculated as follows:

$$\frac{36.3 + (0.21 \times 8) + (11.0 \times 2)}{0.65} = 92.28 W$$

Example B

The power requirement for a Netra t1 system operating at 65% PSU efficiency and containing:

- 440 MHz CPU
- 1Gbyte RAM
- Two 18 Gbyte disk drives
- CD-ROM drive

is calculated as follows:

$$\frac{36.3 + (0.21 \times 16) + (13.8 \times 2) + 3.2}{0.65} = 108.4W$$

Note – To calculate the total power requirement for several Netra t1 systems installed in a single rack or cabinet, add together the individual power requirement figure (TABLE 2-2) for each Netra t1 you have installed.

Calculating the Heat To Be Dissipated

To calculate the heat generated by a Netra t1 system so that you can estimate the heat your cooling system must dissipate, convert the figure for the system's power requirement (see "Calculating the Power Requirements for your Netra t1" on page 9) from watts to BTU/hr. A general formula for doing this is to multiply the figure for the power requirement by 3.415. For example, the heat that must be dissipated for the system in:

- Example A is 92.28 x 3.415=315.14 BTU/hr
- Example B is 108.4 x 3.415=370.19 BTU/hr

What's Next?

When you have used this chapter to calculate the power and cooling requirements for your Netra t1 system, go to Chapter 3 which tells you how to assemble the DC input power cables for the Netra t1 Model 100, or, if you are installing a Model 105 system, go straight to Chapter 4 to find out how to install the optional hardware modules available for the Netra t1.

CHAPTER 3

Using DC Power

This chapter applies only to the Netra t1 Model 100. If you have purchased a Netra t1 Model 105, skip this chapter and go to Chapter 4 on installing the optional hardware modules available for the Netra t1.

This chapter contains the following sections:

- "DC Source Site Requirements" on page 12
- "DC Connection Materials" on page 14
- "Assembling the DC Input Power Cable" on page 15

What's Next?

When you have followed the instructions in this chapter to assemble the DC input power cables, go to Chapter 4 for information about installing any optional hardware modules you need. Do not power up the system (see Chapter 7) until you have installed the Netra t1 into a rack (see Chapter 5), connected up the cables and set up serial connections to the system (see Chapter 6).

DC Source Site Requirements

The Netra t1 Model 100 has a pair of 3-position Wago connectors.

The product is suitable for use in –48 VDC (classified SELV) nominal or –60 VDC nominal systems.

The DC source must be:

- Electrically isolated by double or reinforced insulation from any hazardous AC or DC source
- Reliably connected to earth
- Capable of providing up to 150 W of continuous power per feed pair.

Note – The Netra t1 Model 100 must be installed in a restricted access location. As defined by the National Electrical Code, this is an area intended for qualified or trained personnel only, access to which is controlled by a locking mechanism (for example, a key lock or an access card system).

Overcurrent Protection Requirements

- Overcurrent protection devices must be provided as part of each host equipment rack.
- The supply source must be electrically isolated from any AC source or other voltages by double or reinforced insulation.
- Circuit breakers meeting the requirements shown in TABLE 3-1 must be fitted between the DC source and the Netra t1, and they must be ON when in the UP position.

TABLE 3-1 Overcurrent Protection Requirements

Description	Requirement
Current rating	7.5A maximum
Voltage	Maximum 60 VDC rated in –48 VDC power systems Maximum 75 VDC rated in –60 VDC power systems
Type	Fast trip
Protection	EITHER: Double pole breaking (both grounded and ungrounded conductor to open on fault) OR: Single pole breaking ungrounded conductor (–48V) to open on fault.
Contact gap	Minimum 3 mm
Nuisance tripping	Circuit breaker must not operate when presented with an in-rush current of 27 amps and a duration of 2.5 microseconds
Quantity	One per feed, up to 2 per system

Note – Overcurrent devices must meet applicable national and local electrical safety codes and be approved for the intended application.

DC Connection Materials

Grounding

- One Thomas & Betts two-hole lug (part number: 54204-UB) suitable for 8 AWG conductor or UL / CSA approved equivalent having 5 / 8 inch pitch. Torque value: 3.5 Nm maximum. Two M5 studs and cupwasher nuts are supplied on the rear of the chassis for connection.
- A Thomas & Betts crimping tool (part number: TBM 5-S), or approved equivalent, is required to secure the lug onto the cable.
- An earthing bus bar that is near the equipment and easily accessible.

Caution – External filtering and / or surge suppression devices may be required on the power feeds where branch circuit electromagnetic characteristics are unknown.

DC Supply and Ground Conductor

The requirements are:

- Suitable conductor material: tinned copper (stranded) only
- Conductors: 12 AWG maximum (between the Netra t1 Model 100 and the circuit breaker). There are three conductors:
  - –48 VDC / –60 VDC Supply (pin 1) (12 AWG)
  - Ground connection to power supply (pin 2) (12 AWG)
  - –48 VDC / –60 VDC Return (pin 3) (12 AWG)
- Cable insulation rating: minimum 75˚C, low smoke fume (LSF), flame retardant
- Cable must conform to GR63-CORE fire resistance requirements
- Branch circuit cable insulation color: per applicable National Electrical Codes
- Grounding cable insulation color: green / yellow

Assembling the DC Input Power Cable

▼ To Assemble the DC Input Power Cable

1. **Determine how many DC input power cables you will need from each DC power source.**

2. **Turn off power to the DC power source through the circuit breakers.**

Caution – Do *not* proceed with these instructions until you have turned off the power to the DC power source through the circuit breakers.

3. **Take a DC connector from the ship kit.**

4. **Locate the three wires coming from the DC power source that will be used in the connection to your unit:**
   - –48V Supply
   - Chassis ground
   - –48V Return

5. **Strip 8mm (0.31 inches) of insulation from each of the wires coming from the DC power source (see** FIGURE 3-1**).**

   Do not strip more than 8mm (0.31 inches) from each wire. Doing so will leave uninsulated wire exposed from the DC connector after the assembly is complete.

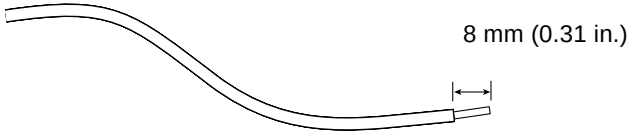

FIGURE 3-1 Stripping the Insulation From the Wire

6. **Insert the tip of the cage clamp operating lever into the rectangular hole directly above the hole in the DC connector where you want to insert the first wire and press down on the cage clamp operating lever (see** FIGURE 3-2**).**

   This opens the cage clamp for this section of the DC connector.

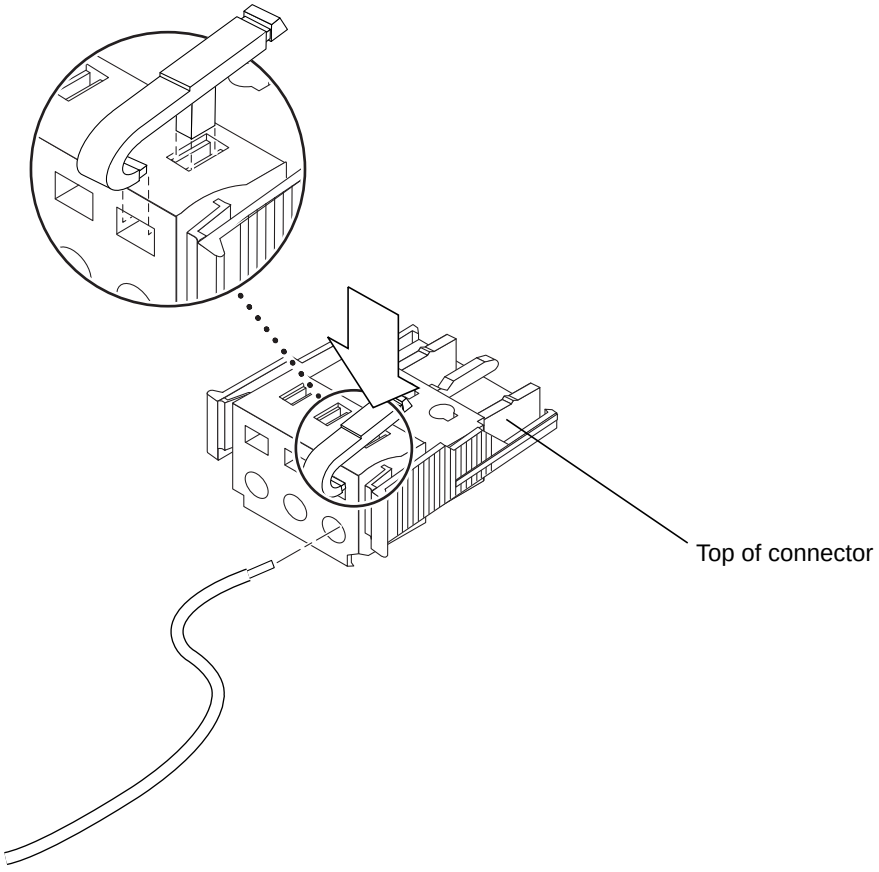

FIGURE 3-2 Opening the DC Connector Cage Clamp (Lever Method)

You can also open the DC connector cage clamp by inserting a small slotted screwdriver into the rectangular hole directly above the hole in the DC connector where you want to insert the first wire, and pressing down on the screwdriver (see FIGURE 3-3).

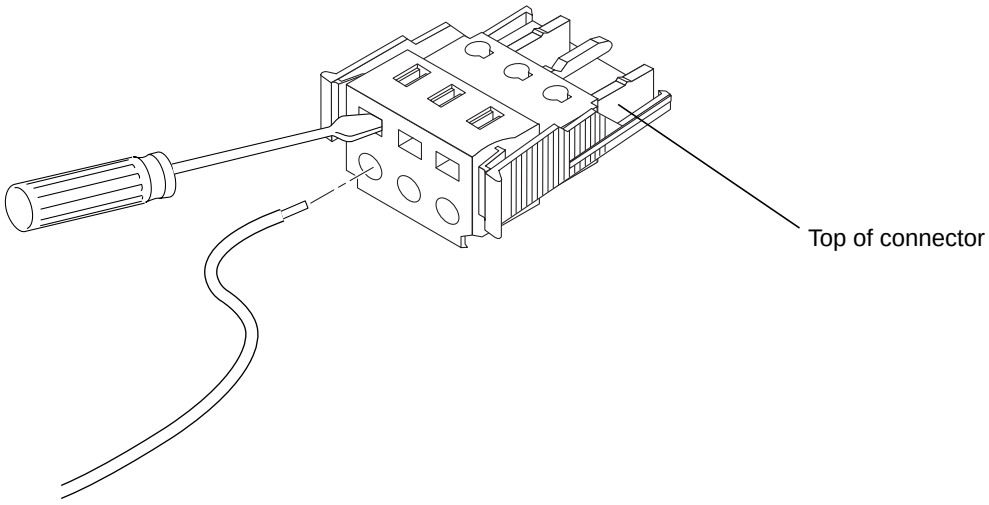

FIGURE 3-3 Opening the DC Connector Cage Clamp (Screwdriver Method)

7. Feed the exposed section of the appropriate wire into that hole in the DC connector.

FIGURE 3-4 shows which wires should be inserted into each hole in the DC connector.

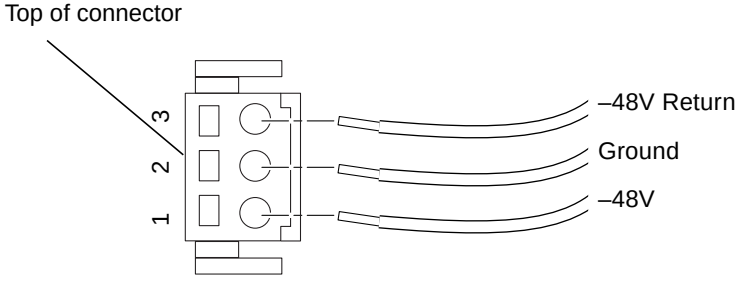

FIGURE 3-4 Assembling the DC Input Power Cable

8. Repeat Step 6 and Step 7 for the other two wires to complete the assembly of the DC input power cable.

9. Repeat Step 4 through Step 8 to create as many DC input power cables as you need.

If you need to remove a wire from the DC connector, insert the cage clamp operating lever or a small screwdriver into the slot directly above the wire and press down (FIGURE 3-2 and FIGURE 3-3).

▼ To Install the Strain Relief Housings

1. **Take the DC connector and insert the bottom portion of the strain relief housing into the notch on the DC connector until it snaps into place (see** FIGURE 3-5**).**

   Make sure the strain relief housing snaps into place on the DC connector; you will not be able to complete the assembly correctly if the strain relief housing is not snapped into place.

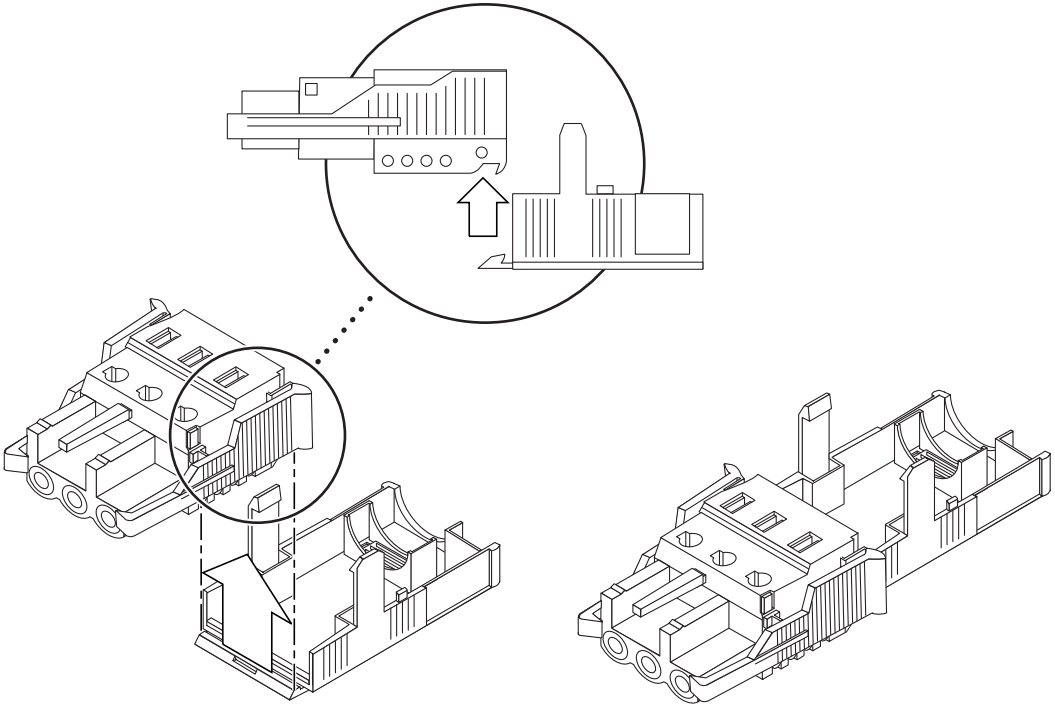

FIGURE 3-5 Inserting the Bottom Portion of the Strain Relief Housing

2. **Route the three wires coming from the DC power source through the opening at the end of the bottom portion of the strain relief housing (see** FIGURE 3-6**).**

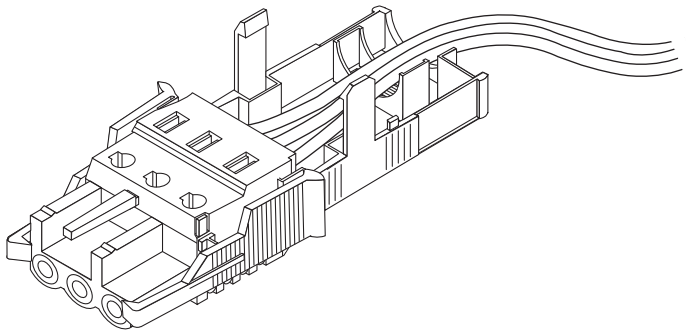

FIGURE 3-6 Routing the Wires Out of the Strain Relief Housing

3. **Get the tie wrap and insert it into the bottom portion of the strain relief housing (see** FIGURE 3-7**).**

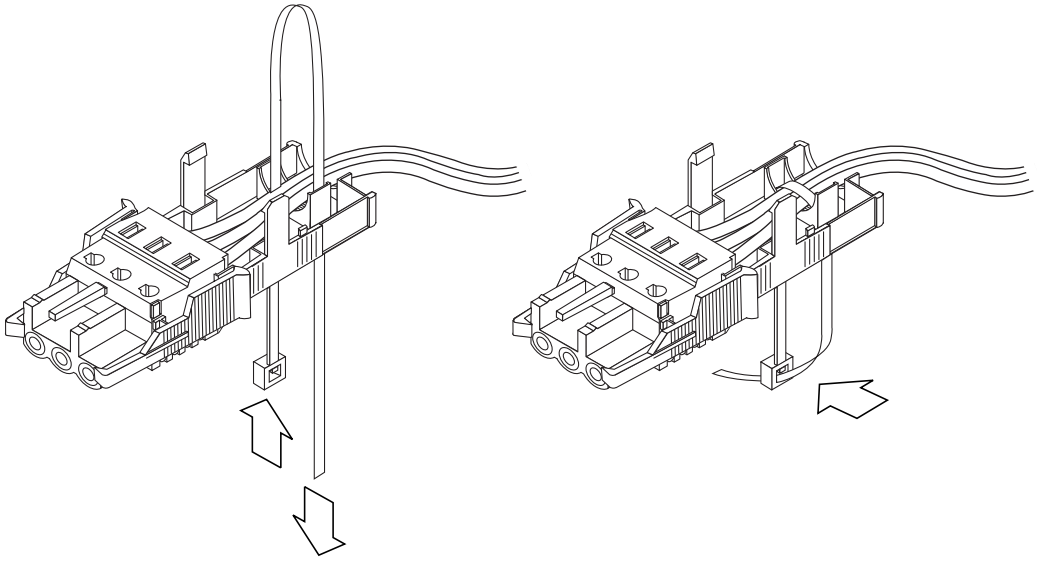

FIGURE 3-7 Securing the Wires to the Strain Relief Housing

4. **Loop the tie wrap over the wires and back out of the strain relief housing and tighten the tie wrap to secure the wires to the strain relief housing (see** FIGURE 3-7**).**

5. **Lower the top portion of the strain relief housing so that the three prongs on the top portion insert into the openings in the DC connector, and push the top and bottom portions of the strain relief housing together until they snap into place (see** FIGURE 3-8**).**

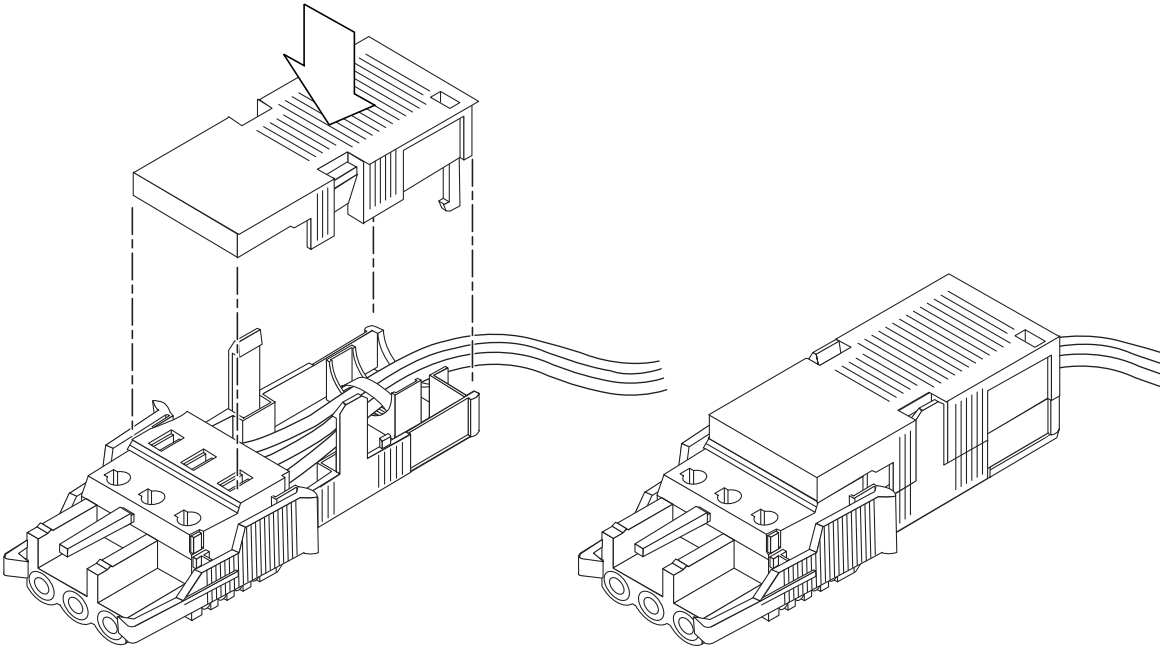

FIGURE 3-8 Assembling the Strain Relief Housing

What's Next?

The DC input power cables for your unit are now completely assembled. For information about connecting the power cords and other cables, see Chapter 6. Do not power up the system (see Chapter 7) until you have installed any optional hardware modules you need (see Chapter 4) and installed the system securely into a rack or cabinet (see Chapter 5).

CHAPTER 4

Installing Hardware Option Modules

If you do not want to install any hardware option modules, skip this chapter and go straight to Chapter 5 which tells you how to install the Netra t1 system into a rack.

This chapter tells you how to install or remove the hot-pluggable hard disk drives available for the Netra t1. To do this, you do not need to power down the system or remove it from the rack.

The chapter also tells you how to remove the cover of the Netra t1, how to identify the parts of the system, and how to install a CD-ROM drive.

For the sales part numbers of the Netra t1 hardware option modules available from your Sun Enterprise Services representative, see Chapter 10.

The chapter contains the following sections:

- "Installing or Removing Hot-Pluggable Hard Disk Drives" on page 22
- "Opening the Netra t1 System" on page 23
- "Identifying the Parts of the Netra t1" on page 26
- "Installing a CD-ROM Drive" on page 27
- "Installing Additional Memory" on page 29
- "Installing a PCI Card" on page 29

What's Next?

When you have used this chapter to install the optional hardware modules you need, go to Chapter 5 for information about installing the Netra t1 into a rack.

Installing or Removing Hot-Pluggable Hard Disk Drives

The hard disk drives are hot-pluggable modules. You do not need to power down the system or remove it from the rack to install or remove hard disk drives.

1. **Remove the front bezel by pressing the latch at either end.**

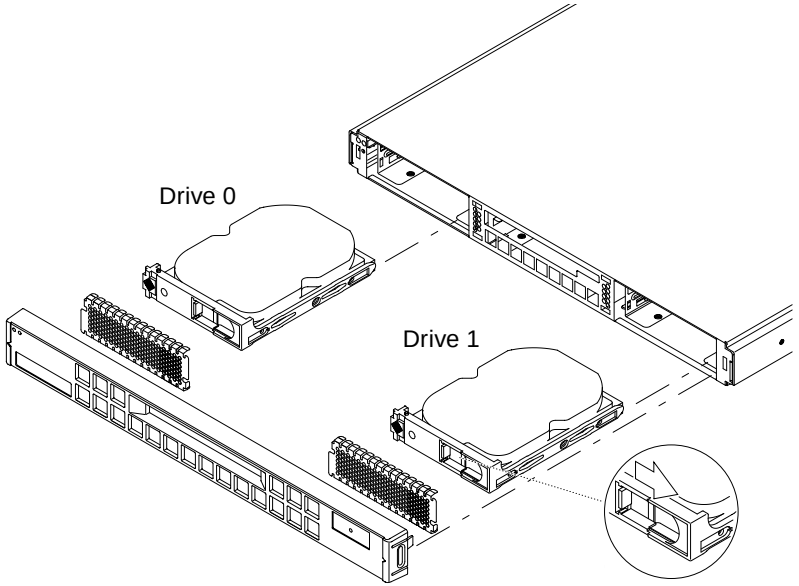

FIGURE 4-1 Inserting Hard Disks into the Drive Bays

2. **Lever out the grilles.**
3. **If you are:**
   - Installing hard disk drives, slide the disk drive(s) into their trays in the front of the system (see FIGURE 4-1). Press them firmly to ensure they are engaged with the backplane connector.
   - Removing hard disk drives, lift the ejector latch (see FIGURE 4-1) at the front of each disk drive you are removing and pull the drive out.
4. **Replace the grilles and front bezel.**

Note – The Netra t1's hard disk drives use SCSI IDs 0 and 1. If you are using an external SCSI device, make sure it does not use these SCSI IDs.

Opening the Netra t1 System

Caution – The system contains electronic parts that are extremely sensitive to static electricity. Do not touch any metal parts. Wear an anti-static wrist strap connected to an earthing point before you open the system.

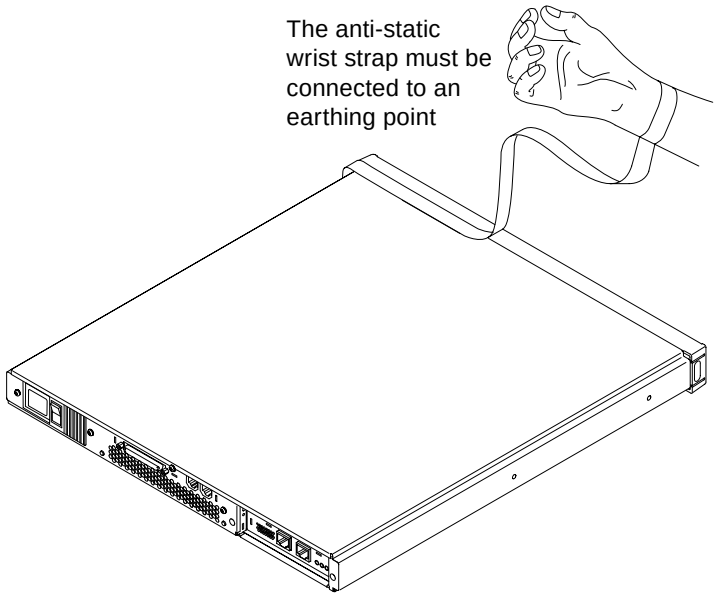

FIGURE 4-2 Using an Anti-Static Wrist Strap

Caution – Before attempting to remove the cover, make sure that all power cords and all other cables have been disconnected from the system.

1. **If your system is new and you have just removed it from its packaging, go straight to Step 3.**

   If your system is currently in use, but you need to open it to install an option module or replace a component, then:

   a. **Shut down Solaris from the console.**

   b. **Turn the power supply switch off.**

   c. **Disconnect the power cord(s).**

   d. **Disconnect all other cables.**

2. **If you have installed the system into a rack or cabinet, remove it.**

3. **Remove the rack mount brackets from the side of the system (see** FIGURE 4-3**).**

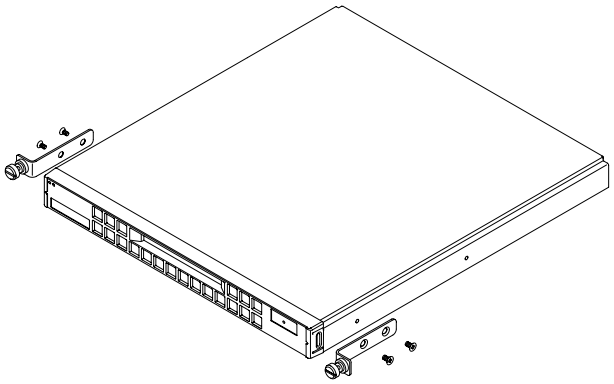

FIGURE 4-3 Removing the Rack Mount Brackets

4. **Place the unit at an ESD station and use an anti-static wrist strap.**

5. **Remove the system's top cover (see** FIGURE 4-4**).**

   a. **Remove the screw at the rear center of the unit.**

   b. **Slide the top cover back and lift it off.**

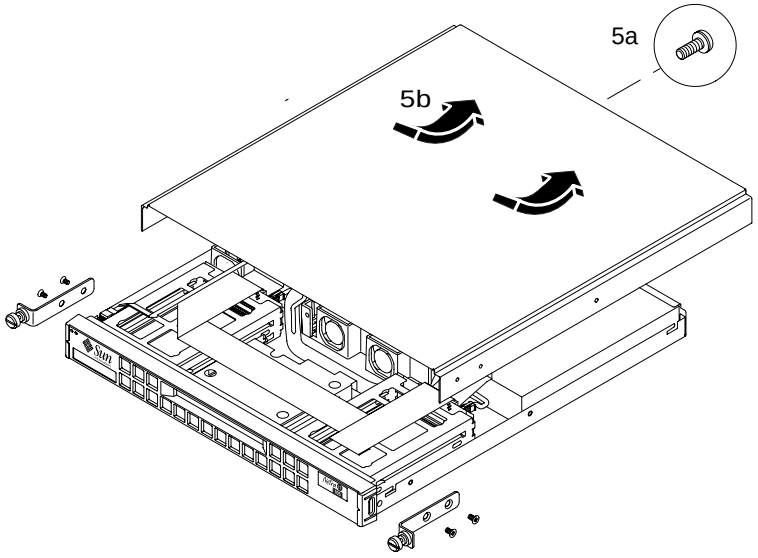

FIGURE 4-4 Removing the Top Cover

Identifying the Parts of the Netra t1

Key to FIGURE 4-1:

1. **Processor cover**
2. **PCI card**
3. **Mid baffle**
4. **CD-ROM drive board and cable**
5. **Cover**
6. **Hard disk drive**
7. **CD-ROM drive (replaces 8)**
8. **Blanking plate (replaces 7)**
9. **Front bezel**
10. **Grille**
11. **Power supply**
12. **Internal SCSI cable**
13. **Motherboard**
14. **Internal serial cable**
15. **PCI card slide retainer**

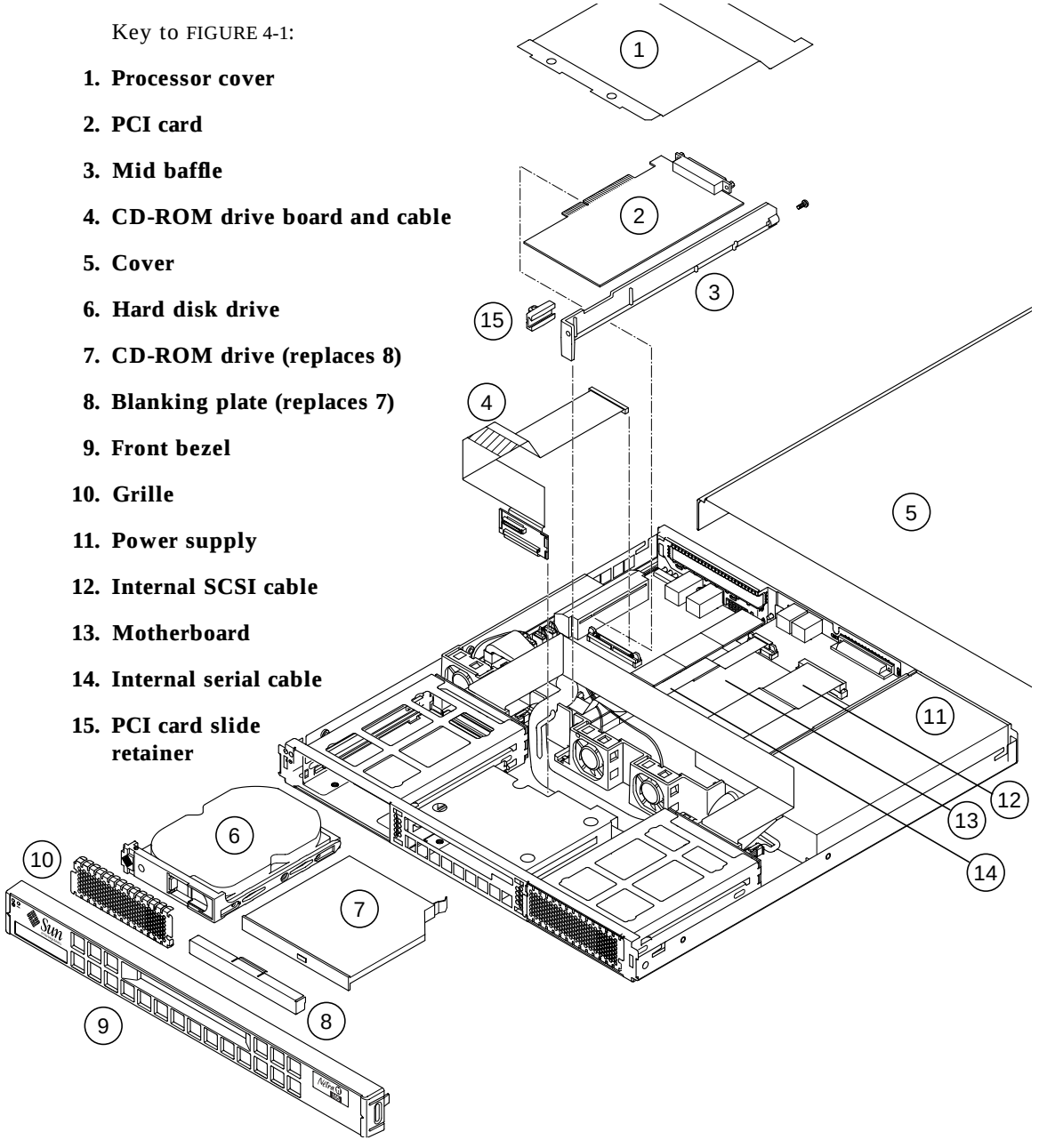

FIGURE 4-5 The Components of the Netra t1 System

Installing a CD-ROM Drive

Caution – Follow the instructions in this section carefully. Do not attempt to install a CD-ROM drive using any procedure other than the one contained in this section. If you do, you risk exposure to radiation.

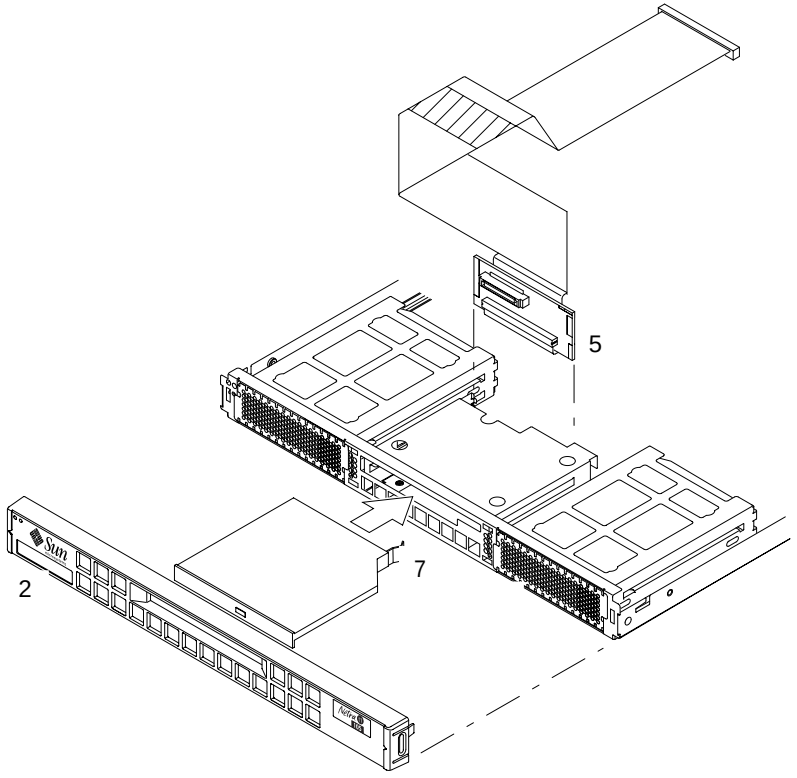

FIGURE 4-6 Installing an Internal CD-ROM Drive

Note – If you are going to install a PCI card, install the CD-ROM drive first. If you have a PCI card already installed, you will need to remove it before installing the CD-ROM drive (see Appendix B).

1. **Remove the top cover by following the procedure described in "Opening the Netra t1 System" on page 23.**
2. **Remove the front bezel by pressing the latch at each end (see** FIGURE 4-6**).**
3. **Remove any PCI card installed in the system (see** Appendix B**).**
4. **Squeeze and pull out the blanking panel.**
5. **Slide the connector card into the slot behind the CD-ROM drive bay (see** FIGURE 4-6**).**
6. **Connect the cable to the slot under the PCI card (see** FIGURE 4-6**).**
7. **Slide the CD-ROM drive into its bay until the catch clicks (see** FIGURE 4-6**).**
8. **Re-install the PCI card (if necessary) as described in "To Install the Card" on page 121 (in Appendix B).**
9. **Replace the system cover and screws.**
10. **Replace the front bezel.**

Installing Additional Memory

There are two ways of adding memory to the Netra t1. You can install:

- A 64, 256, or 512 Mbyte memory board on top of the currently installed board.
- A stack of four 256 Mbyte memory boards (these must each be of part number 370-4155).

For the sales part numbers of the different 64, 256 and 512 Mbyte memory boards available from your Sun Enterprise Services representative, see Chapter 10.

To install new memory boards, follow the instructions in Appendix A.

Installing a PCI Card

For a list of the Ethernet, Fast Ethernet, and ATM PCI cards available from your Sun Enterprise Services representative, see Chapter 10.

To install a PCI card into the Netra t1, follow the instructions in Appendix B.

What's Next?

When you have installed the optional hardware modules you need, go to Chapter 5 for information about installing the Netra t1 into a rack.

CHAPTER 5

Installing the Netra t1 into a Rack

This chapter describes how to mount a Netra t1 system in a rack.

The chapter contains the following sections:

- "Installing into a Sun 72-inch Rack" on page 32
- "Installing into a 19-inch Rack" on page 38
- "Installing into a Two-Post Relay Rack" on page 43

What's Next?

When you have installed the Netra t1 system into the rack, go to Chapter 6 for information about connecting up the cables and setting up serial connections.

Installing into a Sun 72-inch Rack

The 72-inch Expansion Rack Mounting Kit

The mounting slides can each be used on either side of the rack. The parts required are listed below:

TABLE 5-1 72-inch Expansion Rack Mounting Kit

Description	Quantity	Part No.
Front slide	2	340-6215
Rear slide	2	340-6234
Cable management bracket	1	340-6151
M4 nuts	4	240-1373
Rack Screw Kit	1	565-1645

A bracket is provided to aid cable management at the rear of the system (see FIGURE 5-1).

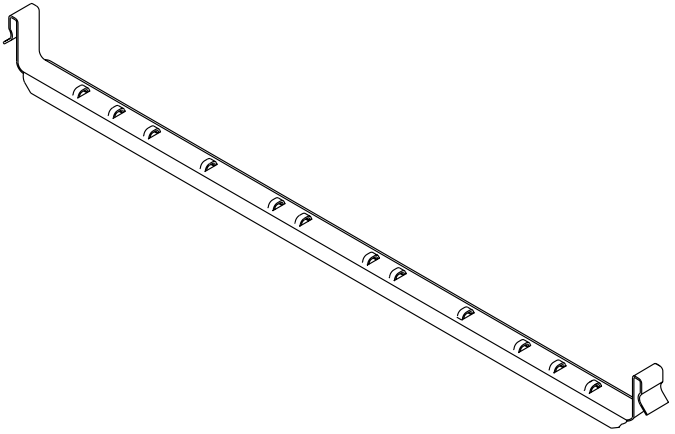

FIGURE 5-1 Cable Management Bracket

▼ To Assemble the Slides and Mount the System

1. **Position the two parts of the slide so that the double-angled ear (A) is to the rear.**
2. **Make sure that the front and rear mounting ears are the correct distance apart, and loosely secure the two parts together using the M4 nuts supplied (see** FIGURE 5-2**).**

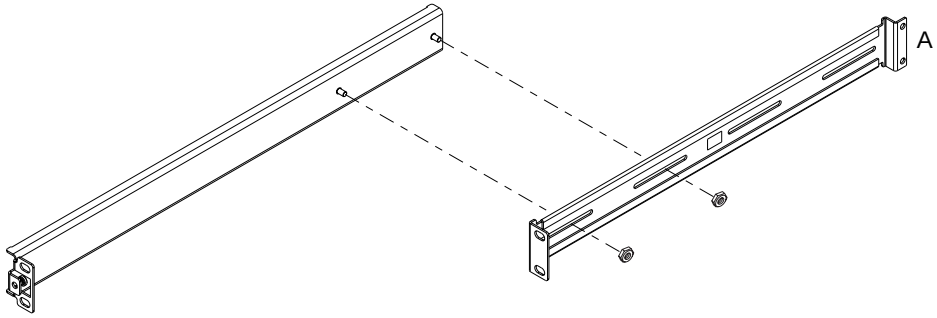

FIGURE 5-2 Slide Mounts for Sun 72-inch Expansion Rack

3. **Adjust the mount to fit the rack.**
4. **Move the brackets so that the studs are in suitable slots and tighten the nuts.**
5. **Fasten the mounting slides to the rack using the screws supplied.**

   Refer to FIGURE 5-3 and FIGURE 5-4. Leave the screws slightly loose to allow adjustment when the Netra t1 system is inserted.

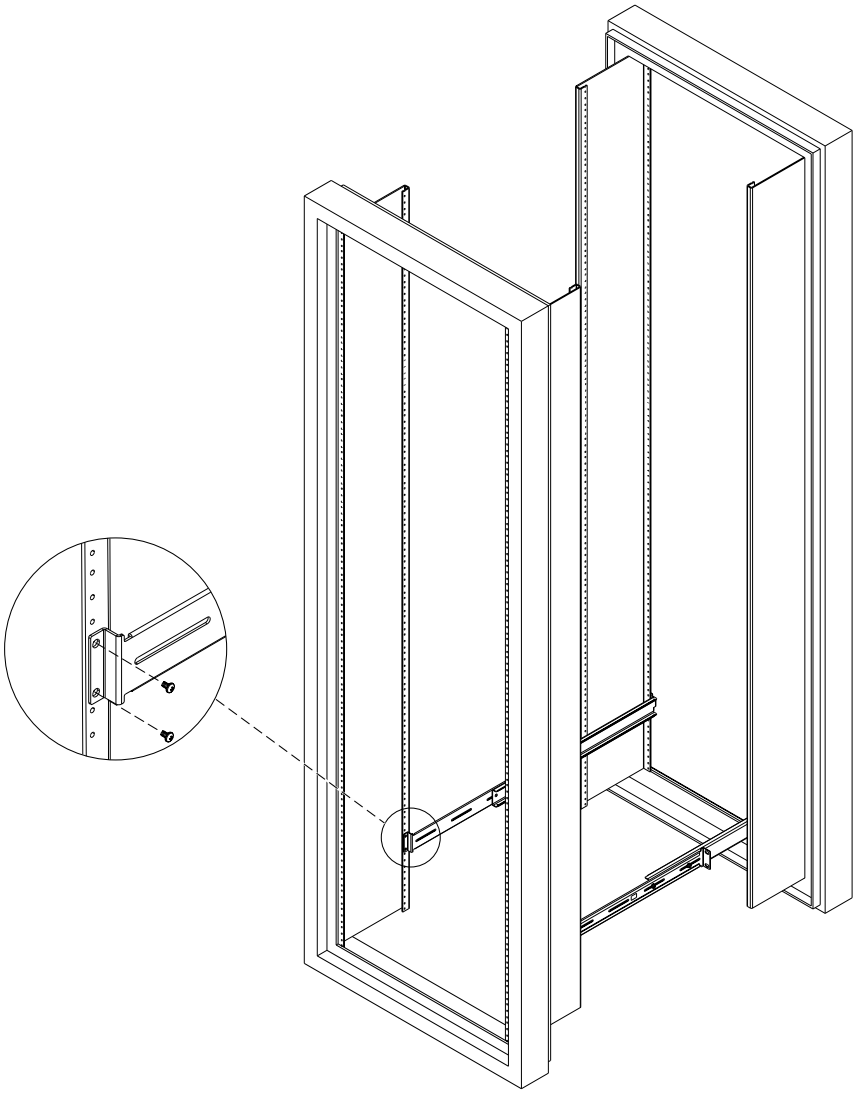

FIGURE 5-3 Fixing Slide Mounts into a Sun 72-inch Expansion Rack – Rear View (side panels removed for clarity)

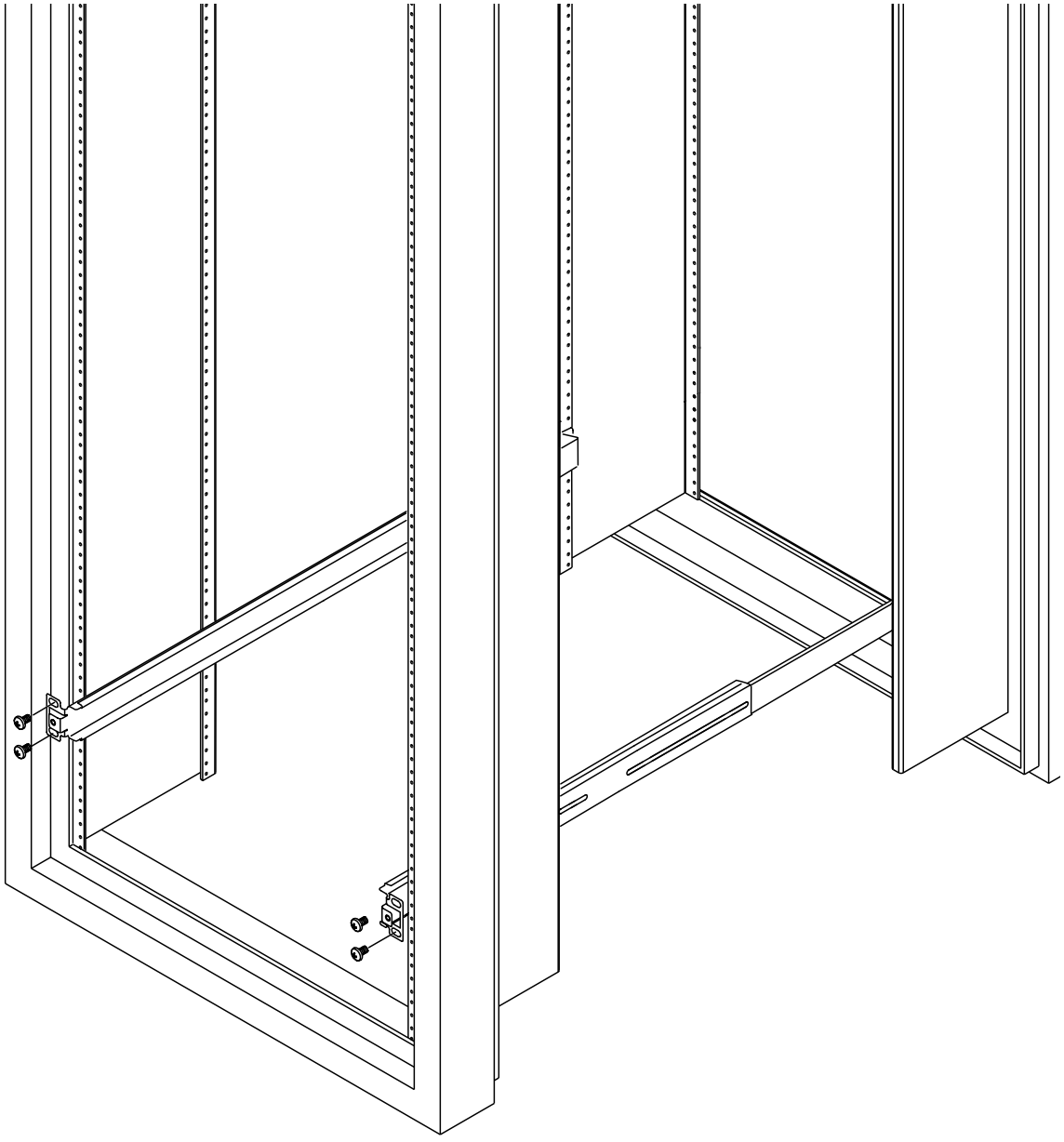

FIGURE 5-4 Fixing Slide Mounts into the Sun 72-inch Expansion Rack – Front View (side panels removed for clarity)

6. **Slide the Netra t1 system into the rack.**

7. **Check the alignment of the thumbscrews either side of the Netra t1 system (see** FIGURE 5-5**).**

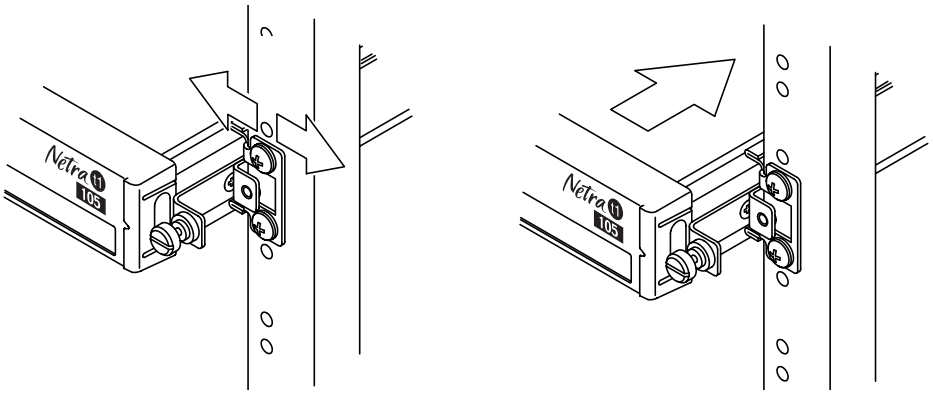

FIGURE 5-5 Adjusting the Mount and Tightening the Thumbscrew

8. **Fasten the slide mount fixing screws.**

   It may be necessary to readjust the fixings in order to align the system as required.

9. **Fasten the thumbscrews at the front of the Netra t1 system finger-tight (see** FIGURE 5-5**).**

▼ To Fit the Cable Management Bracket

Hook the bracket over the slide mounts at the rear of the system.

You can use the loops in the bracket to secure the cables with cable ties.

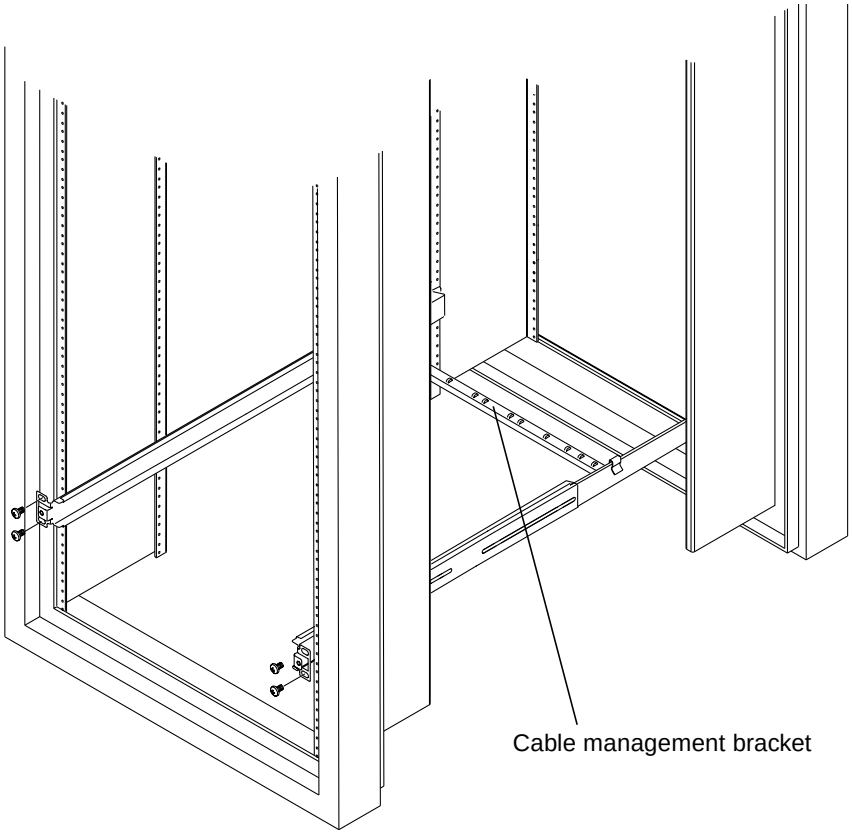

FIGURE 5-6 The Cable Management Bracket Installed in a Sun 72-inch Expansion Rack

What's Next?

When you have installed the Netra t1 system into the rack, go to Chapter 6 for information about connecting up the cables and setting up serial connections.

Installing into a 19-inch Rack

The 19-inch Rack Mounting Kit

The mounting slides can each be used on either side of the rack.

The parts required are listed below:

TABLE 5-2 19-inch Rack Mounting Kit

Description	Quantity	Part No.
Front slide	2	340-6215
Rear slide	2	340-6234
Cable management bracket	1	340-6151
M4 nuts	4	240-1373
Rack Screw Kit	1	565-1645

A bracket is provided to aid cable management at the rear of the system (see FIGURE 5-7).

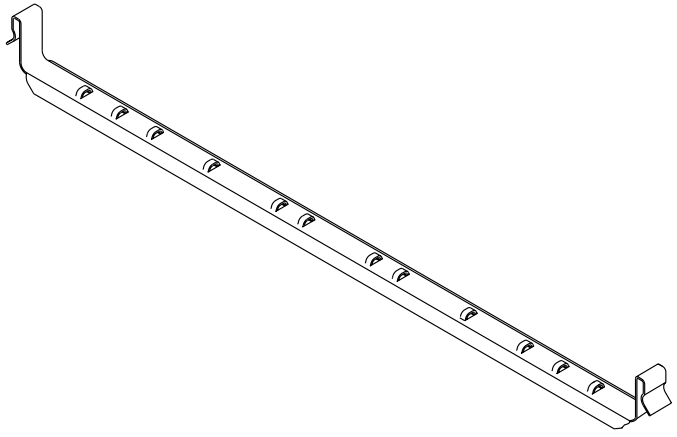

FIGURE 5-7 The Cable Management Bracket

▼ To Assemble the Slides and Mount the System

1. **Position the two parts of the slide so that the double-angled ear (A) is to the front (see** FIGURE 5-8**).**

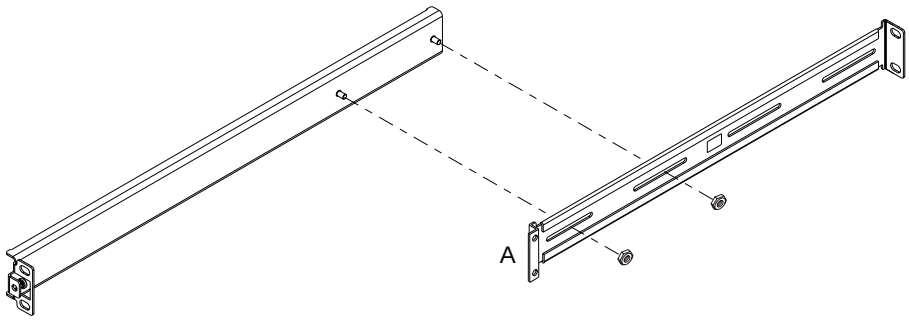

FIGURE 5-8 19-inch Rack Slide Mounts

2. **Make sure that the front and rear mounting ears are the correct distance apart, then loosely secure the two parts together using the M4 nuts supplied.**
3. **Adjust the mount to fit the rack.**

   The ears must be outside the rack.
4. **Move the brackets so that the studs are in suitable slots and tighten the nuts.**
5. **Fasten the mounting slides to the rack using the screws supplied (see** FIGURE 5-9**).**

   Leave the screws slightly loose to allow adjustment when the Netra t1 system is inserted.

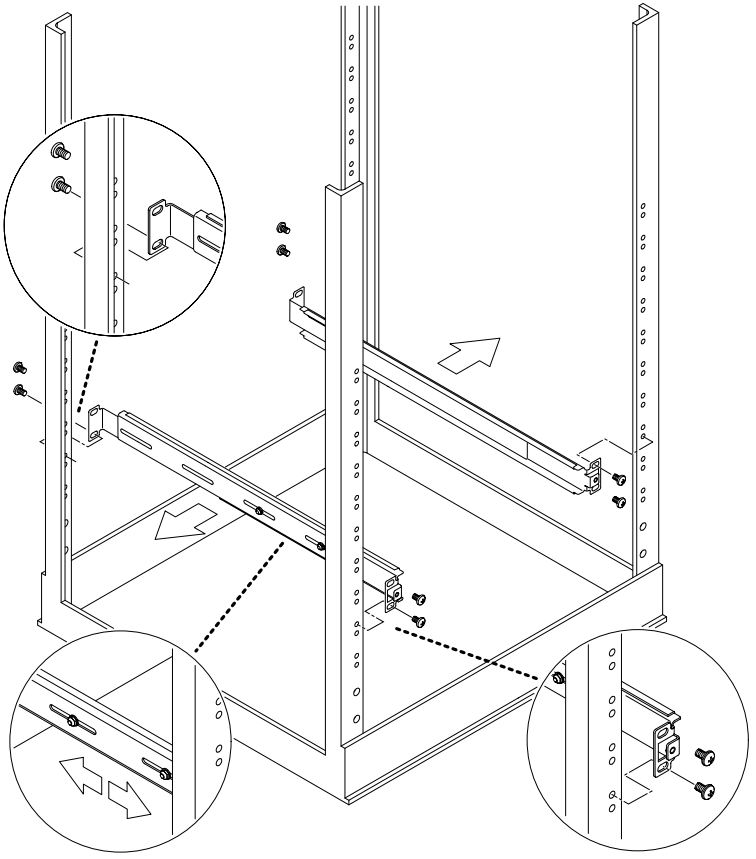

FIGURE 5-9 Fitting 19-inch Slide Mounts to the Rack

6. **Slide the Netra t1 system into the rack (see** FIGURE 5-10**).**
7. **Check the alignment of the thumbscrews either side of the Netra t1 system (see** FIGURE 5-10**).**
8. **Fasten the slide mount fixing screws (see** FIGURE 5-10**).**

   It may be necessary to readjust the fixings in order to align the system as required.
9. **Fasten the thumbscrews at the front of the Netra t1 until they are finger-tight (see** FIGURE 5-10**).**

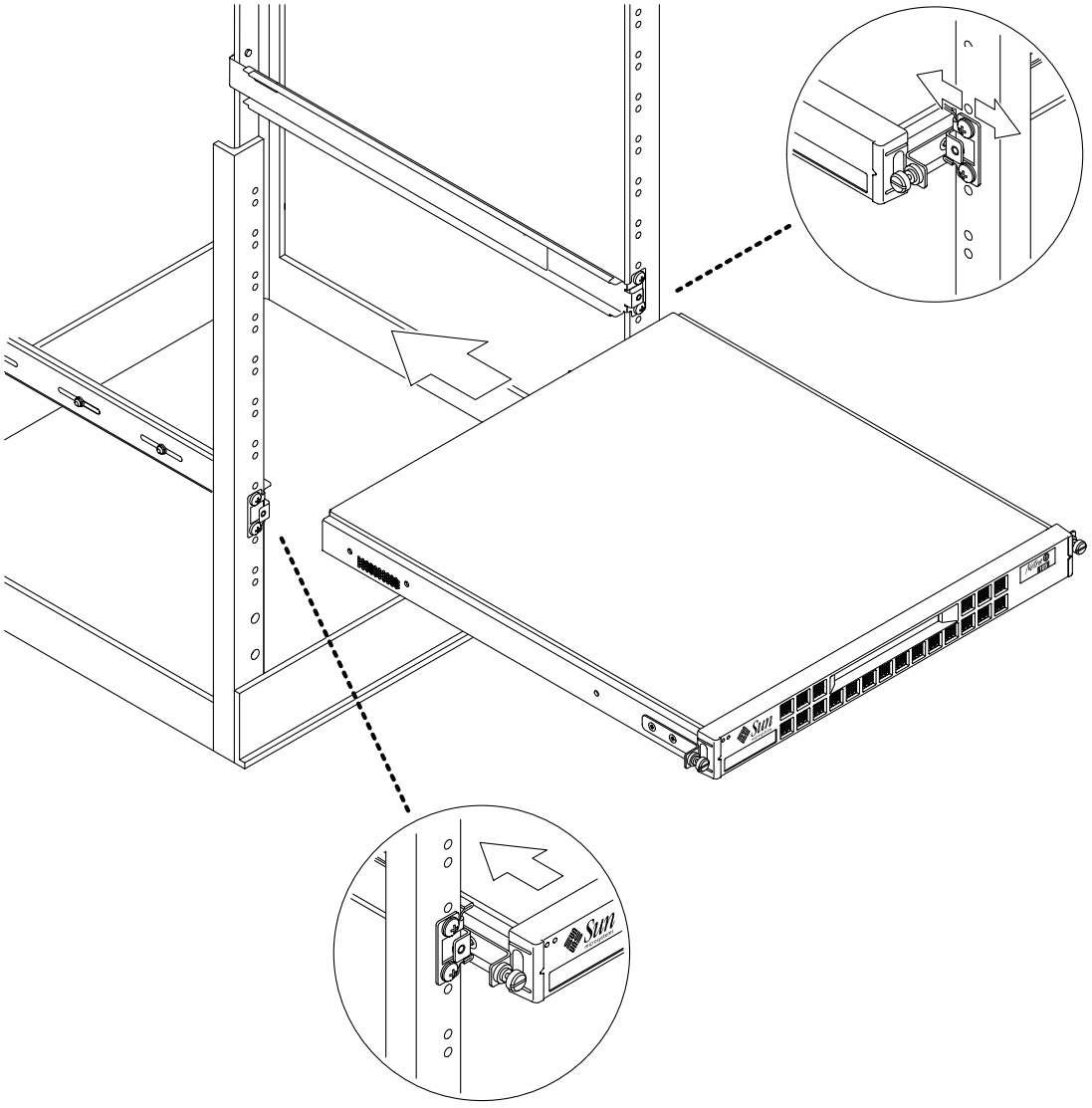

FIGURE 5-10 Fitting the Netra t1 into a 19-inch Rack

▼ To Fit the Cable Management Bracket

Hook the bracket over the slide mounts at the rear of the system.

You can use the loops in the bracket to secure the cables with cable ties.

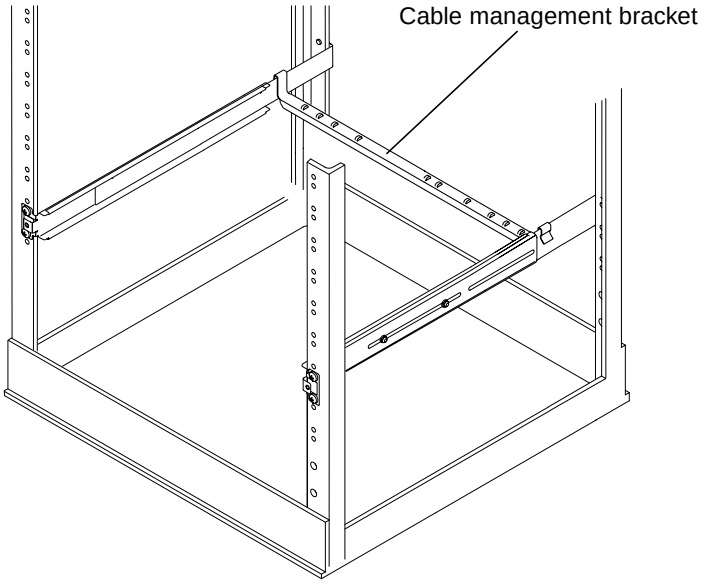

FIGURE 5-11 The Cable Management Bracket Installed in a 19-inch Rack

What's Next?

When you have installed the Netra t1 system into the rack, go to Chapter 6 for information about connecting up the cables and setting up serial connections.

Installing into a Two-Post Relay Rack

The Fixed Mounting Bracket Kit

The parts you require are listed in TABLE 5-3.

TABLE 5-3 Fixed Bracket Mounting Kit

Description	Quantity	Part No.
Brackets	4	340-5819
M4 x 8mm countersunk Phillips screw kit	1	565-1654

▼ To Fit the Fixed Mounting Brackets

1. **Remove the thumbscrew rack mounting brackets from either side of the system (see** FIGURE 5-12**).**

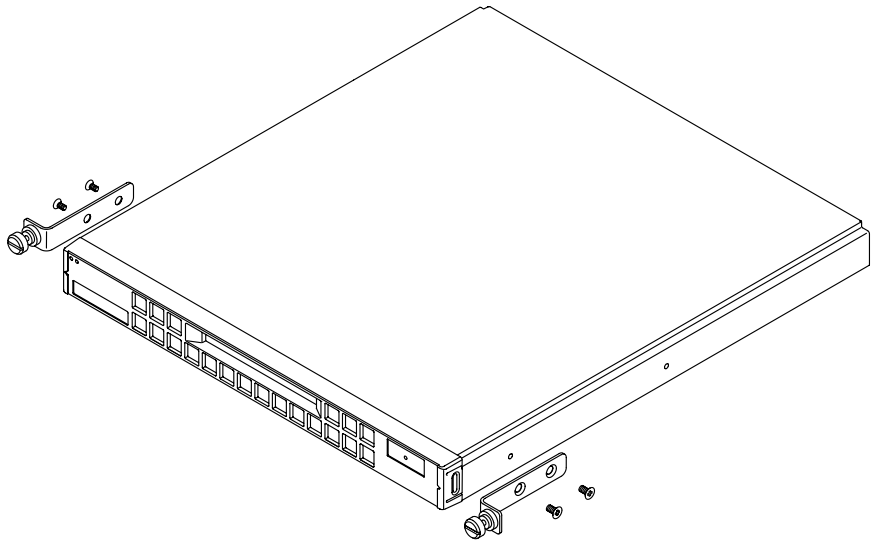

FIGURE 5-12 Removing the Thumbscrew Brackets

2. **Fit the two front fixed brackets to the rearmost two of the three tapped holes at the front of the system.**

   Use the Phillips-head countersunk screws provided (see FIGURE 5-13, but do NOT fit the rear brackets yet).

Note – Do not fit the rear brackets until Step 4.

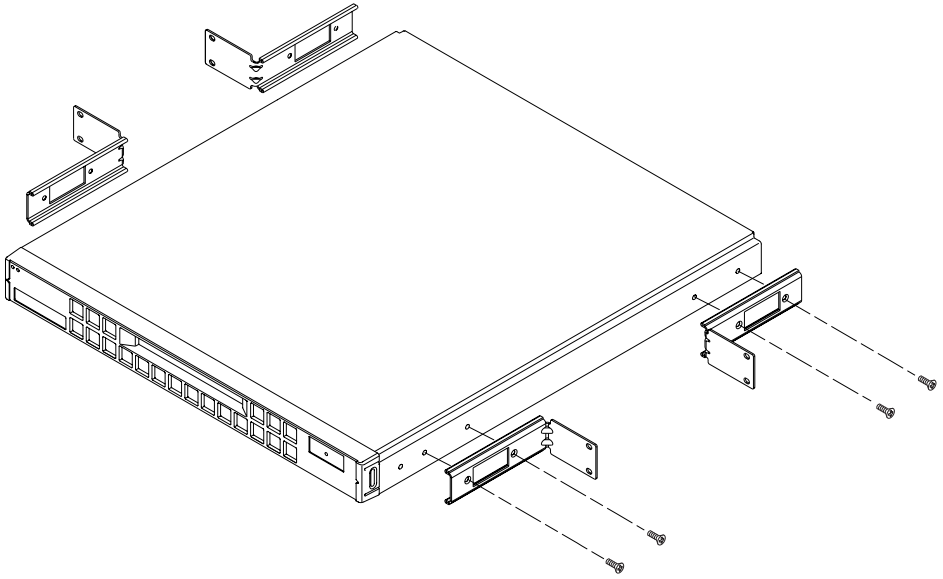

FIGURE 5-13 Fitting the Fixed Mounting Brackets

3. **Now secure the system to the rack using just the front brackets, but do not fully tighten the screws yet.**
4. **Fit the two rear fixed brackets to the two tapped holes at the rear of the system on each side, using the Phillips-head countersunk screws provided.**
5. **Secure the rear brackets to the rack in the appropriate place (see** FIGURE 5-14**).**
6. **Once you are certain that all the rack fixing screws are correctly aligned, they can be fully tightened.**

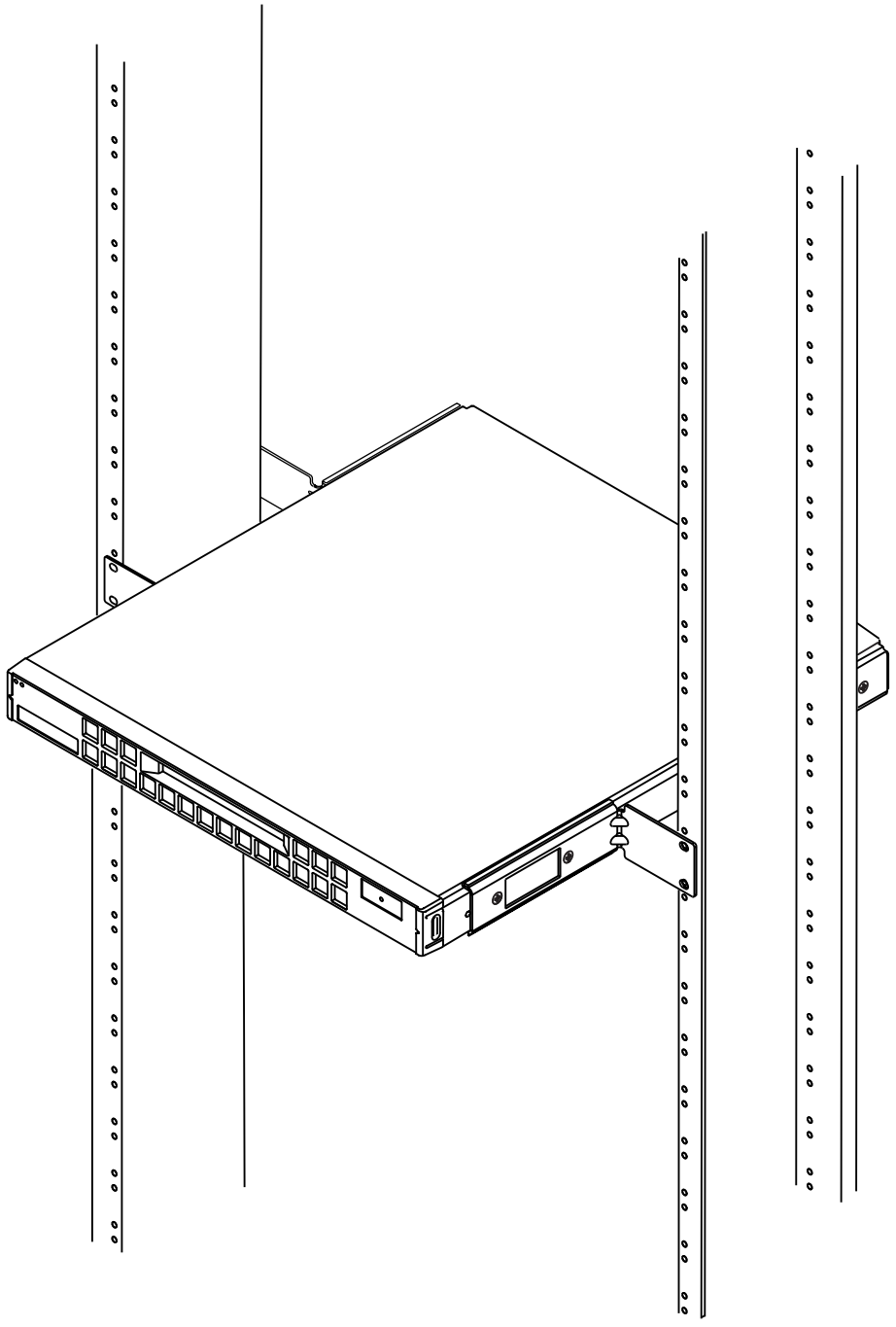

FIGURE 5-14 The Netra t1 Installed in a Two-Post Rack

What's Next?

When you have installed the Netra t1 system into the rack, go to Chapter 6 for information about connecting up the cables and setting up serial connections.

CHAPTER 6

Connecting the Cables

This chapter tells you how to connect the power cables and the Ethernet and serial cables to the Netra t1 system. It also tells you how to set up the serial connections you need.

Make sure you have installed the Netra t1 system into a rack or cabinet (see Chapter 5) before following the instructions in this chapter.

The chapter contains the following sections:

- "Connecting the Cables to the Netra t1" on page 48
- "Connecting the Power Cord(s)" on page 50
- "Setting up Serial Connections" on page 52

What's Next?

When you have followed the instructions in this chapter telling you how to connect up the cables and set up serial connections to the Netra t1, you are ready to power up the system. For information about powering up the system, see Chapter 7.

Connecting the Cables to the Netra t1

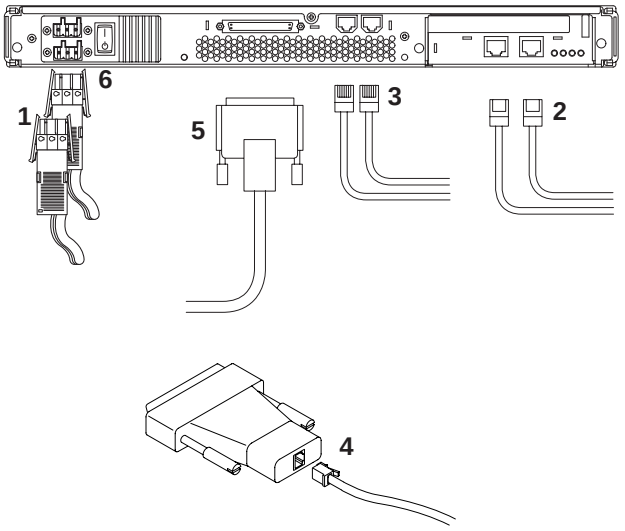

FIGURE 6-1 Connecting the Netra t1 Model 100 System

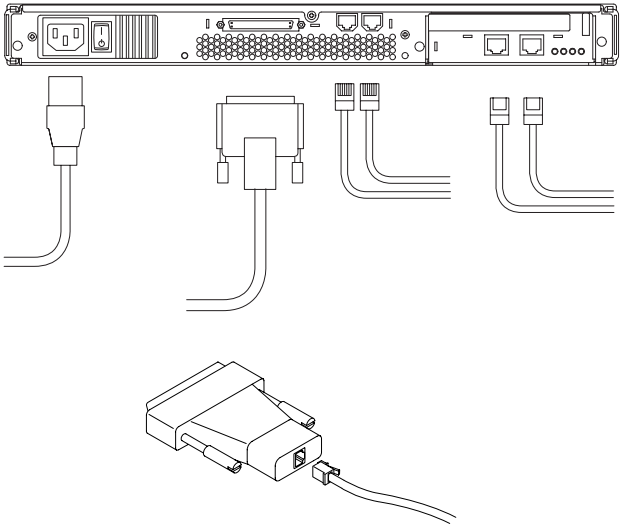

FIGURE 6-2 Connecting the Netra t1 Model 105 System

Before following the instructions in this section, make sure you have installed the Netra t1 system into a rack or cabinet (see Chapter 5).

1. **Connect the power cord or cords (see also** FIGURE 6-3 **and** FIGURE 6-4 **in the next section, “Connecting the Power Cord(s)” on page 50).**

2. **Connect the system to at least one Ethernet hub. You can connect to a maximum of two.**

3. **Connect at least one serial device. For more information, see “Setting up Serial Connections” on page 52.**

   If you want to use the Netra t1’s remote monitoring and management facilities, make sure you use the port labeled Serial A/LOM. For more information about remote monitoring and management, see Chapter 9.

4. **If you intend to configure the Netra t1 system directly from a dumb terminal or a Sun workstation, insert the serial cable into the DB25 adapter supplied (see** FIGURE 6-1 **and** FIGURE 6-2**).**

   When you have done this, plug the adapter into the DB25 serial connector on the terminal or Sun workstation.

5. **If you need to connect the Netra t1 system to an external SCSI device, you will need to use the SCSI cable supplied with that device.**

   The Netra t1’s external SCSI bus is compatible with narrow (8-bit) or wide (16-bit) single-ended SCSI devices.

Note – If you are connecting an external SCSI device, make sure that its SCSI ID is not 0 or 1. The Netra t1’s hard disk drives use these SCSI IDs.

---

6. **Go to Chapter 7 which tells you how to power the system up.**

7. **For information about the patches you need to apply, see Chapter 8.**

Connecting the Power Cord(s)

This section contains diagrams showing how the DC connectors for the Model 100 and the AC connector for the Model 105 connect to the system.

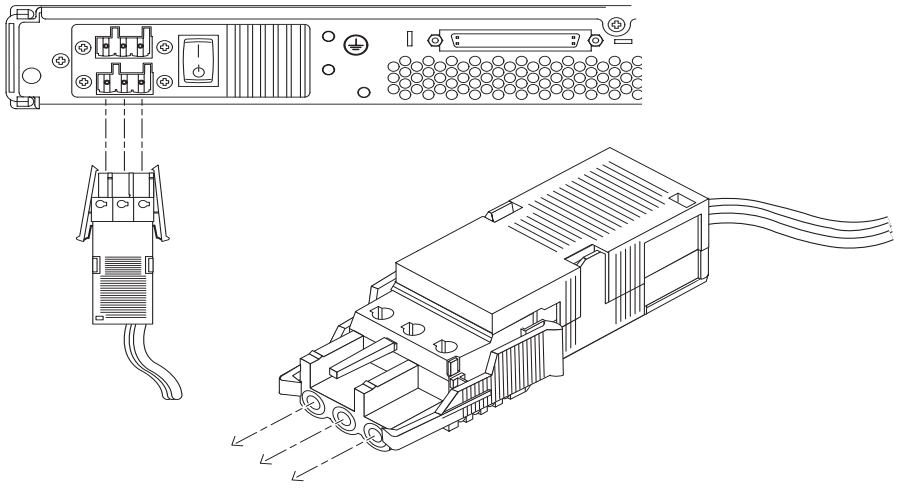

FIGURE 6-3 Model 100: Connecting a DC Power Cord

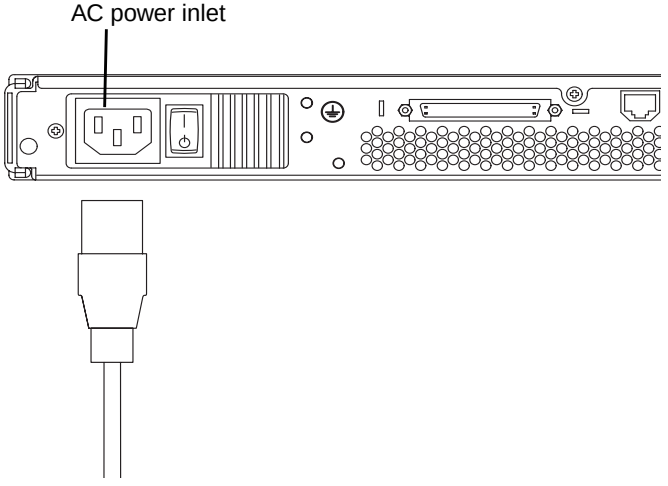

FIGURE 6-4 Model 105: Connecting the AC Power Cord

Caution – AC-powered Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Your AC-powered Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded outlet.

Setting up Serial Connections

To perform the inital configuration when you install the Netra t1 system, and also for on-going monitoring and management of the system, you will need to use at least one of the serial ports on the system's rear panel. You can connect either or both serial ports to any of the following devices:

- A dumb terminal.
  For this connection, you can use the standard RJ45 patch cable supplied with the Netra t1 Model 100/105, but you need to insert one end into the DB25 adapter also supplied with the Netra t1 system.
- A Sun workstation.
  For this connection, you can use the standard RJ45 patch cable supplied with the Netra t1 Model 100/105, but you need to insert one end into the DB25 adapter also supplied with the Netra t1 system.
- A Terminal Server (or patch panel connected to a Terminal Server).
  The pinouts for the Netra t1 system's serial ports correspond with the pinouts for the RJ45 ports on the Asynchronous Serial Interface Breakout Cable supplied by Cisco for use with the Cisco L2511 Terminal Server. For terminals from other manufacturers, you may need to make your own cross-over (null-modem) cable (see "Cross-overs for Connecting to a Terminal Server" on page 53).
- A modem.
  For this connection, you can use the standard RJ45 patch cable supplied with the Netra t1 Model 100/105, but you need to insert one end into the DB25 adapter also supplied with the system. Do not connect a modem to the Serial A/LOM port; use the Serial B port. The DTR signal asserted on the Serial A/LOM port changes to DCD during booting or when control of the port is taken over by the LOM device, and this can cause modem connections to be lost.

Note – The Serial A/LOM port cannot be used for binary data transfers. To perform anything other than ASCII transfers, use the port labeled Serial B.

Cross-overs for Connecting to a Terminal Server

The serial ports on the Netra t1 are DTE ports. If you are connecting them to other DTE ports, then the cabling between the devices you are connecting to each other needs to perform a cross-over.

Note – Do not use the Serial A/LOM port for modem connections. The DTE signal on this port changes temporarily to DCD when the Netra t1's LOM (Lights-Out Management) device reports an event on the serial port. This can result in the loss of a modem connection. If you are connecting the Serial A/LOM port to a Terminal Server, disable modem control on the Terminal Server port.

The pinouts for the Netra t1's serial ports correspond with the pinouts for the RJ45 ports on Cisco Terminal Servers. This means, for example, that if you are using a Cisco L2511 Terminal Server (and you are connecting the Netra t1 system to it using the Cisco Asynchronous Serial Interface Breakout Cable), you can either:

- connect the Breakout Cable directly to the Netra t1, or you can
- connect the Breakout Cable to a patch panel and use the straight-through patch cable (supplied by Sun) to connect the patch panel to the Netra t1 (see FIGURE 6-5).

Note – You do not have to use the Netra t1 with a Cisco Terminal Server. For other Terminal Servers, check the manufacturer's documentation to see if the pinouts of the serial ports on the Terminal Server match the pinouts of the Netra t1's serial ports. If they do not, you need to make a cable that takes each pin on one of the Netra t1's serial ports to the corresponding pin in the Terminal Server's serial port.

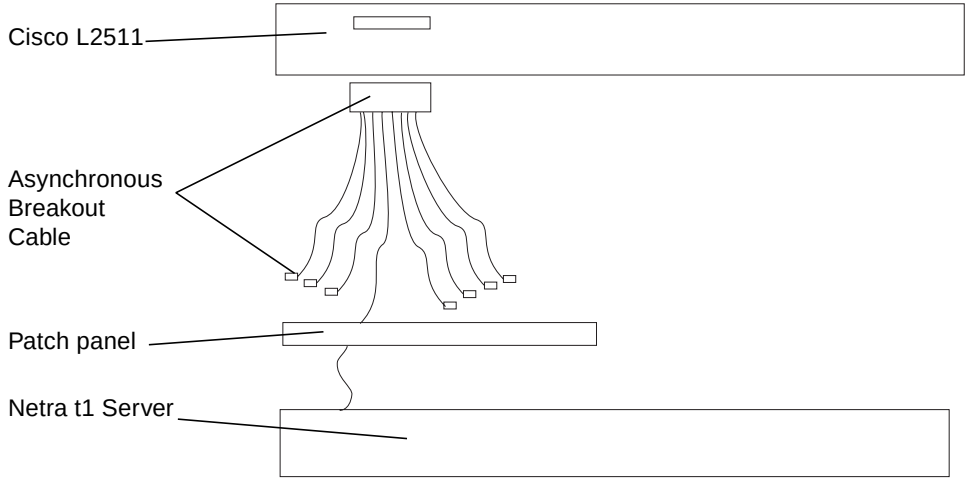

FIGURE 6-5 Patch Panel Connection Between a Cisco L2511 and a Netra t1 System

Note – When viewed from the rear of the Netra t1 system, pin 1 of the RJ45 serial port is on the left, pin 8 on the right.

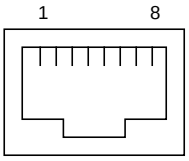

FIGURE 6-6 Serial Port Pins 1 to 8

TABLE 6-1 Pin Cross-overs for Connecting to a Typical Terminal Server

Netra t1 Serial Port (RJ45 Connector) Pin	Terminal Server Serial Port Pin
Pin 1 (RTS)	Pin 1 (CTS)
Pin 2 (DTR)	Pin 2 (DSR)
Pin 3 (TXD)	Pin 3 (RXD)
Pin 4 (Signal Ground)	Pin 4 (Signal Ground)
Pin 5 (Signal Ground)	Pin 5 (Signal Ground)
Pin 6 (RXD)	Pin 6 (TXD)
Pin 7 (DSR)	Pin 7 (DTR)
Pin 8 (CTS)	Pin 8 (RTS)

Using a DB25 Adapter for Your Serial Link

The pinouts are identical for both of the RJ45 serial ports on the Netra t1 system. To connect to a UNIX `tip` session or a vt100 terminal, you need to use either the DB25 (25-Pin DSUB Male to 8-POS RJ45 Female) adapter that is supplied by Sun (part no. 530-2889) with your system, or an alternative adapter that performs the same pin cross-overs. The Sun-supplied DB25 adapter enables you to connect to any Sun system. The cross-overs it performs are listed in TABLE 6-2.

Note – If you need to set up a modem connection to the Netra t1 system, you must use the port labeled Serial B. The Serial A / LOM port does not assert the required constant DTR signal.

Note – When viewed from the rear of the Netra t1 system, pin 1 of the RJ45 serial port is on the left, pin 8 on the right.

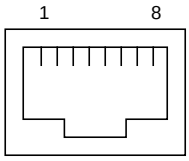

FIGURE 6-7 Pins 1 to 8 on the Serial Ports

TABLE 6-2 Pin Cross-overs in the Sun DB25 (25-pin) Adapter

Serial Port (RJ45 Connector) Pin	25-pin Connecter
Pin 1 (RTS)	Pin 5 (CTS)
Pin 2 (DTR)	Pin 6 (DSR)
Pin 3 (TXD)	Pin 3 (RXD)
Pin 4 (Signal Ground)	Pin 7 (Signal Ground)
Pin 5 (Signal Ground)	Pin 7 (Signal Ground)
Pin 6 (RXD)	Pin 2 (TXD)
Pin 7 (DSR)	Pin 20 (DTR)
Pin 8 (CTS)	Pin 4 (RTS)

Using a DB9 Adapter for Your Serial Link

To connect to a terminal that has a 9-pin serial connector, connect one of the Netra t1's serial ports to a DB9 (9-pin) adapter that performs the pin cross-overs listed in TABLE 6-3.

Note – When viewed from the rear of the Netra t1 system, pin 1 of the RJ45 serial port is on the left, pin 8 on the right.

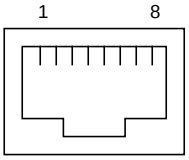

FIGURE 6-8 Pins 1 to 8 on the Serial Ports

TABLE 6-3 Pin Cross-overs for a DB9 (9-pin) Adapter

Serial Port (RJ45 Connector) Pin	9-pin Connector
Pin 1 (RTS)	Pin 8 (CTS)
Pin 2 (DTR)	Pin 6 (DSR)
Pin 3 (TXD)	Pin 2 (RXD)
Pin 4 (Signal Ground)	Pin 5 (Signal Ground)
Pin 5 (Signal Ground)	Pin 5 (Signal Ground)
Pin 6 (RXD)	Pin 3 (TXD)
Pin 7 (DSR)	Pin 4 (DTR)
Pin 8 (CTS)	Pin 7 (RTS)

Settings for the Serial Connections

The settings you need to use for a serial connection are listed in TABLE 6-4. If you need to perform binary data transfers (that is, transfers of anything more than simple ASCII character streams), use the Serial B port. Communication on the Serial A/LOM port is subject to interruption by the 'Lights-Out' Management (LOM) device (see Chapter 9).

TABLE 6-4 Settings for Connecting to the Serial A/LOM or Serial B Port

Parameter	Setting
Connector:	Serial A/LOM or Serial B (use Serial B for binary data transfers)
Rate:	9600 baud
Parity:	No
Stop bits:	1
Data bits:	8

What's Next?

When you have connected up the cables and set up serial connections to the Netra t1, you are ready to power up the system. For information about powering up the system, see Chapter 7.

CHAPTER 7

Powering Up the Netra t1

This chapter tells you how to power up the Netra t1 system.

The chapter contains the following sections:

- "Powering Up and Configuring for the First Time" on page 60
- "Using the Power (On/Standby) Switch" on page 63

What's Next?

When you have followed the instructions in this chapter telling you how to power on the system, and when you have booted and logged in, go to Chapter 8 for information about using different versions of Solaris.

For information about monitoring and managing the Netra t1, see Chapter 9.

For information about Troubleshooting, see Chapter 11.

Powering Up and Configuring for the First Time

To perform the initial configuration of the Netra t1 system, set up a serial connection via the port labeled Serial A/LOM on the Netra t1 (see Chapter 6).

Make sure you have the Netra t1's power cord or cords connected (see Chapter 6).

Configuring via a Terminal Server

To access the Netra t1 system from a Sun workstation via a Terminal Server, open a Terminal Session on the Sun workstation, and type:

```
# telnet <IP address of Terminal Server> <port number>
```

For example, for a Netra t1 system connected to port 10000 on a Terminal Server whose IP address is 192.20.30.10, you would type:

```
# telnet 192.20.30.10 10000
```

Configuring from a Terminal or Workstation

To access the Netra t1 system from a dumb terminal just set up a connection between the terminal and the Netra t1 system.

To access the Netra t1 system from a Sun workstation directly connected to the system, set up the connections between the devices and run a terminal session. Note, however, that before you can connect to the Netra t1 system's Serial A/LOM port from a Sun workstation, you must edit the `hardwire:` line in your `/etc/remote` file. By default, this line looks as follows:

```
hardwire:\:dv=/dev/term/b:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D
```

You must replace the letter b (after term/ and before the third colon) with the letter a, so that the line looks as follows:

```
hardwire:\:dv=/dev/term/a:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D
```

▼ To Power the System Up for the First Time

Before following the instructions in this section, read them to find out what information the system prompts you for when you start it for the first time.

With the system connected to the power supply but not powered up, and with a serial connection to the Serial A/LOM port and a connection to at least one Ethernet hub (as described in Chapter 6), follow the instructions below:

1. **At the lom> prompt which automatically appears in your Terminal screen, type the following command to power on the system:**

```
lom> poweron
```

   For more information about the lom> prompt and the commands that are available from it, see Chapter 9.

2. **During booting you will be prompted for certain information.**

   The first question the system asks you is what language you want it to use when it prompts you for the information it needs. Specify a language.

3. **Next specify your locale.**

4. **Specify the type of terminal you are using to communicate with the Netra t1.**

5. **Specify a Host Name for the system.**

6. **When asked if you are connected to the network by a Solaris-supported Ethernet card, answer Yes.**

7. **Specify which of the Ethernet ports you intend to use as the primary Ethernet connection.**

   For the port labeled Net0, specify hme0. For the port labeled Net1, specify hme1.

8. **Specify a valid IP address for the system.**

9. **Specify the Name Service you want the system to use.**

10. **Specify the name of the Domain that the system will be a part of.**

11. **Specify whether you want the system to search the network for a Name Server or whether you want it to use a particular Name Server.**

12. **If you chose to use a particular Name Server, specify the Host Name and IP address of the Name Server.**

13. **Specify whether the Netra t1 system is to be part of a subnet.**

14. **Specify a Netmask for the system.**

15. **Confirm the information you have typed in and, when prompted, provide the time and date information the system needs.**

16. **When prompted, give a password (if any) for users logging in as root.**

17. **When asked if you want the sytem to perform Automatic Power Saving Shutdown, answer No.**

Note – If you answer Yes, the system will automatically put itself into Standby mode after a period of idleness.

---

18. **When you have provided the information the system needs, it will boot.**

What's Next?

When you have powered on the system and booted and logged in, go to Chapter 8 for information about using different versions of Solaris.

For information about monitoring and managing the Netra t1, see Chapter 9.

For information about Troubleshooting, see Chapter 11.

Using the Power (On / Standby) Switch

Caution – The power switch (on the rear panel of the Netra t1 system) is not an On / Off switch, it is an On / Standby switch. It does not isolate the equipment.

The power (On / Standby) switch of the Netra t1 system is a rocker, momentary switch. It controls only low voltage signals; no high-voltage circuits pass through it. This means that the main method of connecting or disconnecting power is by inserting or removing the power supply cord(s). The system contains no integral circuit breakers. To isolate it, you must break all connections to it. If you do not do this by removing the power supply cord(s), you must instead open all external circuit breakers.

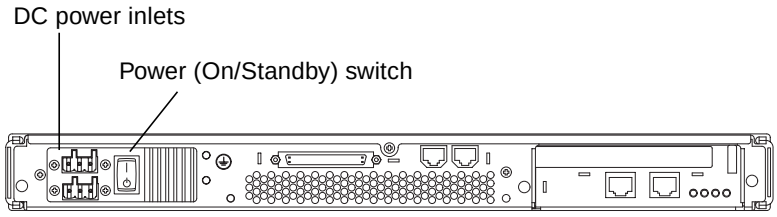

FIGURE 7-1 Model 100 System Switch

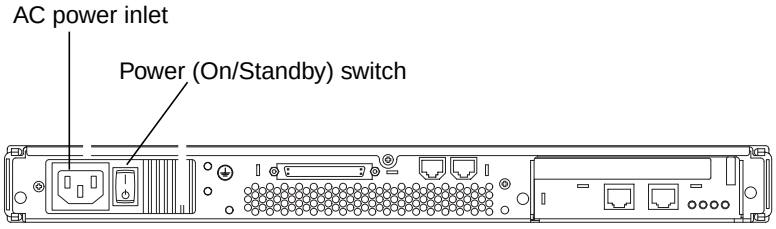

FIGURE 7-2 Model 105 System Switch

The symbols on the switch are as follows:

On – Press this to apply power to the system.

Standby – Press this to put the system into *Standby* mode.

CHAPTER 8

Using Different Versions of Solaris

Note – The Netra t1 ships with Solaris 7 (11/99) pre-installed and fully patched. If you do not intend to alter this configuration of the Netra t1, skip this chapter.

This chapter tells you how to install Solaris 2.6 onto a Netra t1. The instructions require you to use the bootable Solaris Operating Environment Installation CD 9/99 (part no. 704-6914-10) supplied with the Netra t1.

Although the Netra t1 ships with Solaris 7 pre-installed and patched, this chapter refers you to the documentation supplied with Solaris 7 and Solaris 8 if you need to install either of those operating systems yourself (for example, if you install Solaris 2.6 but then decide to upgrade to Solaris 7 or 8). The Solaris 7 and 8 installations are standard procedures involving no supplementary CD. We recommend you install Solaris 7 (11/99 or later).

The chapter goes on to tell you which patches you need to apply if you install Solaris 2.6, 7 or 8 yourself (instead of using the system as configured and patched by Sun during manufacturing).

The chapter contains the following sections:

- "Installing Solaris release 2.6" on page 66
- "Installing Solaris release 7 or 8" on page 68
- "The Patches You Need" on page 68

Installing Solaris release 2.6

This section tells you how to install release 2.6 of the Solaris operating environment onto a Netra t1 Model 100/105 system.

Note – The Netra t1's factory-installed software includes the 'Lights-Out' Management software. If you install a new operating system and you want to use the 'Lights-Out' Management facilities described in Chapter 9, you must re-install the 'Lights-Out' Management software. This is available on a CD (part number: X6972A) from your Sun Enterprise Services representative.

▼ To Install Solaris 2.6 from the CDs

Before you begin the installation process, make sure you have the:

- Two Solaris 2.6 (5/98) CDs (part no. 704-6220-10)
- Solaris Operating Environment Installation CD 9/99. This CD is supplied with the Netra t1 (part no. 704-6914-10). It includes the kernel update patch (105181-xx) you need for running Solaris 2.6 on a Netra t1 system.

For information about what to type when you want to boot from the CD, see "Patch 108620-04: How to Boot from a CD" on page 69.

Note – To make sure all the most recent patches on the Solaris 2.6 (5/98) CDs are applied, install the entire distribution plus OEM support.

---

1. **Insert the Solaris Operating Environment Installation CD into the CD-ROM drive and, at the** `ok` **prompt, type the following (but refer to the section called "Patch 108620-04: How to Boot from a CD" on page 69):**

```
ok boot cdrom
```

2. **Follow the instructions displayed on the console.**

   These tell you when to insert the Solaris 2.6 (5/98) CDs.

▼ To Install Solaris 2.6 from the Network

Note – To make sure all the most recent patches on the Solaris 2.6 (5/98) CDs are applied, install the entire distribution plus OEM support.

Before following the instructions below, make a note of the MAC address of the system you are installing Solaris 2.6 onto. This is displayed on the banner that appears on your console when you boot the system.

1. **On another Solaris system, which must be on the same network as the Netra t1 system you are installing Solaris 2.6 onto, create a Solaris 2.6 (5/98) net install server. Do this by following the instructions supplied with the Solaris 2.6 (5/98) CDs.**

   Because the instructions below require you to install software from a second CD (the Solaris Operating Environment Installation CD) onto the system you are using as the net install server, you cannot leave the Solaris 2.6 (5/98) CD in the CD drive. Instead, therefore, you must copy the install image from the Solaris 2.6 (5/98) CD onto the local disk of the system you are using as the net install server.

2. **When the install server setup is complete, remove the Solaris 2.6 (5/98) CD and insert the Solaris Operating Environment Installation CD.**

3. **Run the** `modify_install_server` **script.**

   For information about running this script, refer to the documentation provided with the Solaris 2.6 (5/98) CDs. Running this script with the Solaris Operating Environment Installation CD inserted updates the net install server with the patches required for the Netra t1.

4. **Register the Netra t1 Model 100/105 with the net install server by running the** `add_install_client` **script on that server.**

   For more information about running the `add_install_client` script, refer to the documentation provided with the Solaris 2.6 (5/98) CD.

5. **On the Netra t1 Model 100/105 that you are installing Solaris 2.6 onto, make sure that the** `autoboot?` **environment variable is set to** `true`**. To do this, type:**

```
ok autoboot?=true
```

6. **Make sure the Netra t1 Model 100/105 you are installing Solaris onto does not contain a valid system disk from which to boot. Or, if it does, break to the** `ok` **prompt and type:**

```
ok boot net
```

7. **Power up the Netra t1 Model 100/105. When you do this, the system will automatically attempt to boot from the network.**

8. **Follow the instructions on the console for a standard installation.**

   For more information, refer to the documentation provided with Solaris 2.6 (5/98).

Installing Solaris release 7 or 8

The Netra t1 system is supplied with Solaris 7 (11/99) already installed and patched. To re-install Solaris 7 (for example, after having previously installed Solaris 2.6) or to install Solaris 8, follow the instructions in the documentation provided with your Solaris 7 or 8 CD. These installations are standard procedures and do not involve supplementary installation CDs.

If you are installing Solaris 7, we recommend you install the version dated 11/99 or later.

Note – The Netra t1's factory-installed software includes the 'Lights-Out' Management software. If you install a new operating system and you want to use the 'Lights-Out' Management facilities described in Chapter 9, you must re-install the 'Lights-Out' Management software. This is available on a CD (part number: X6972A) from your Sun Enterprise Services representative.

The Patches You Need

TABLE 8-1 tells you which patches you need to apply to run the different versions of Solaris on a Netra t1 Model 100/105. The latest versions of each patch are available from your local Sun Enterprise Services representative or from SunSolve:

`http://www.sun.com/sunsolve`

Note – If you are using the factory-installed system software, you do not need to apply any patches. They have been applied for you already.

TABLE 8-1 Patches Required for Solaris 2.6 (5/98), or Solaris 7 or 8

Software Affected	Number of Patch Required for Solaris 2.6 (5/98), Solaris 7 or Solaris 8
LOMlite	108146-02 (Available on SunSolve)
UserPROM	108620-04 (Available on SunSolve)
SystemPROM	108673-01 (Available on SunSolve)

Patch 108620-04: How to Boot from a CD

Booting with the Patch Applied

If you have patch 108620-04 applied, this section tells you what you need to type to boot from the CD-ROM drive you are using. (Note that the Netra t1 now ships with this patch already applied.)

If you are booting from an internal CD-ROM drive, type:

```
ok boot cdrom
```

If you are booting from an external CD-ROM drive in a Netra t1 system that does not contain an internal CD-ROM drive, type:

```
ok boot cdrom
```

If you are booting from an external CD-ROM drive and your Netra t1 system also contains an internal CD-ROM drive, type:

```
ok boot cdrom1
```

Booting Without the Patch Applied

If you are configuring an earlier Netra t1 system that does not have patch 108620-04 applied, this section tells you what you need to type to boot from the CD-ROM drive you are using.

If you are booting from an internal CD-ROM drive, type:

```
ok boot cdrom
```

If you are booting from an external CD-ROM drive, type:

```
ok boot cdrom1
```

Patch 108673-01: Setting Environment Variables

Note – If you have patch 108673-01 applied, you do not need to set any environment variables. Note that the Netra t1 now ships with this patch already applied. You only need to follow the instructions below if you do not have patch 108673-01 applied to the operating system.

Patch 108673-01 contains a version of the Sun OpenBoot™ PROM (OBP) software specifically for the Netra t1. It is required because the default parameter settings in versions of the OBP software used on other Sun platforms are not correct for the Netra t1.

This means that, if you do not have patch 108673-01 applied, you must set certain OBP parameters manually for the Netra t1. It also means that, if you use the `set-defaults` command after setting these parameters manually, you must set them manually again. (The `set-defaults` command returns the OBP parameters to their defaults. Unless you have patch 108673-01 applied, these defaults will not be correct for the Netra t1.)

The OBP parameters are stored in NVRAM on the motherboard. To make sure they are correct for a Netra t1 system that does not have patch 108673-01 applied, do the following:

1. **Return the OBP parameters to their standard settings by typing**:

```
ok set-defaults
```

2. **Type the following commands:**

```
ok setenv pcib-probe-list 1,2,3
ok setenv output-device ttya
ok setenv input-device ttya
```

Note – Whenever you use the `set-defaults` command from the `ok` prompt, make sure you afterwards set the variables listed in Step 2 above.

PART II Maintenance and Management

CHAPTER 9

Monitoring and Managing the System

This chapter describes the Netra t1 system's remote monitoring and management facility. It contains the following sections:

- "What You Can Use the 'Lights-Out' Management (LOM) Facility For" on page 76
- "How the LOM Device Sends its Event Reports" on page 77
- "Interrogating the LOM and Using it to Power Up or Reset the System" on page 79
- "Configuring the LOM to Restart the System Automatically After a Lock-up" on page 84
- "Other Ways of Configuring the LOM" on page 85
- "Utilites Associated with the LOM Device" on page 86
- "The System's Front and Back Panel LEDs" on page 87
- "The Fans Monitored by the LOM Device" on page 88

What You Can Use the ‘Lights-Out’ Management (LOM) Facility For

The Netra t1 includes a management facility which allows you to detect and respond quickly to problems with the Power Supply Unit (PSU) or fans. It is particularly useful for monitoring servers remotely that are deployed in a “lights out” environment. But you can also use it to perform quick onsite management tasks via a local serial connection.

This management facility is provided by a device on the Netra t1’s motherboard called the Lights-Out Management (LOM) device and by software that is pre-installed on your system during manufacturing.

Note – If you install new system software onto the Netra t1 and you want to continue using the Lights-Out Management facility, you must re-install the LOM software. A CD containing the software is available from your Sun Enterprise Services representative (part number: X6972A).

You can use the LOM facility to:

- Monitor the status of the power supply, fans, fault LED and alarms even when the system is powered down.
- Power the system up and down.
- Turn a Fault LED on (for example, to enable you to identify a particular system in a rack containing a number of Netra t1s).

You can also configure the LOM device on the Netra t1 to perform an automatic system restart in the event of a lock-up.

How the LOM Device Sends its Event Reports

The LOM device monitors the status of the fans and the power supply even when the system is powered down (the LOM device operates on standby power). If it detects a fault, it turns on the Fault LED on the system's front and rear panels and stores a report in an event log which resides in memory on the LOM device itself. What it does next depends on whether the operating system is running with a daemon called `lomlited` enabled:

- If your Netra t1 system is running the factory-installed system software, then the Lights-Out Management software, including the `lomlited` daemon, is fully installed and enabled.
- If you are not running the factory-installed system software (but are running another configuration of Solaris), then you need to re-install the Lights-Out Management software from a CD (part number: X6972A) that is available from your Sun Enterprise Services representative.

When the Operating System is Running and the `lomlited` Daemon is Installed and Running

When the operating system is running and the `lomlited` daemon is enabled, the LOM device is monitored by the `lomlited` daemon. This daemon sends LOM event reports to `syslogd` giving them the identifier string `lomlited`. `syslogd` handles them in the way it is configured to handle event reports (by default, it sends them to the console and stores them in `/var/adm/messages`).

The `lomlited` daemon is started by an rc script. The daemon is stored in `/etc/init.d`.

When the `lomlited` Daemon is Not Running

The `lomlited` daemon does not monitor the LOM device when:

- The operating system is not running (for example, when the `ok` prompt is displayed on your console).
- You have disabled the `lomlited` daemon.
- You have installed new operating system software (over the factory-installed system software) but have not manually re-installed the LOMlite software.

In any of these circumstances, when the `lomlited` daemon is not running and an event affecting the fans or power supply occurs, the LOM device takes control of the Serial A/LOM port and sends an event report onto that port. When it has sent the report, the LOM device relinquishes control of the serial port. Note that this can interfere with communication on the Serial A/LOM port (see note below).

Note – LOM reports that occur when the `lomlited` daemon is not running can interfere with communication on the Serial A/LOM port. If you do not have the `lomlited` daemon installed and enabled then, to prevent the LOM from interrupting serial communication, either use the Serial B port as your console port or turn off LOM event reporting (see "Stopping the LOM from Sending Reports to the Serial A Port When the Daemon is not Running" on page 78).

Capturing LOM Event Reports Passively on the Serial A/LOM Port

To monitor LOM events as they occur, keep a terminal connected to Serial Port A.

For information about setting up serial connections to the Netra t1, see Chapter 6.

For information about using LOM commands to interrogate the LOM device, see "Interrogating the LOM and Using it to Power Up or Reset the System" on page 79.

Stopping the LOM from Sending Reports to the Serial A Port When the Daemon is not Running

LOM reports that occur when the `lomlited` daemon is not running can interfere with information you are attempting to send or receive on the Serial A/LOM port.

If you do not have the LOM software installed or you have disabled the `lomlited` daemon, you might want to stop the LOM device from sending reports to the Serial A/LOM port.

To do this, use the `lomctl` utility stored in the `/usr/bin` directory.

To turn off reporting to the serial port, type:

```
# lomctl serialeventsoff
```

To turn it on again, type:

```
# lomctl serialeventson
```

Interrogating the LOM and Using it to Power Up or Reset the System

If you want to use the LOM device to power on or off or to reset the system, or if you want to view the LOM's event log, you need to connect a terminal to Serial Port A (see Chapter 6) and then put the port into LOM mode. In LOM mode, you can execute LOM commands.

For information about setting up serial connections to the Netra t1, see Chapter 6.

To use the LOM commands, type the LOM escape sequence at a console connected to the Serial A/LOM port. The escape sequence is #. (hash period):

```
# #.
```

When you type the LOM escape sequence, the LOM device takes control of the Serial A/LOM port and the `lom>` prompt appears on your terminal screen. You can type the LOM escape sequence at any time.

Powering the System Up and Down

To power up the system, type the following at the `lom>` prompt:

```
lom> poweron
```

To power down the system, type the following at the `lom>` prompt:

```
lom> poweroff
```

Resetting the System

To reset the system, type the following at the `lom>` prompt:

```
lom> reset
```

Checking the Current Status of all Components Monitored by the LOM

To see the current status of all the components monitored by the LOM, type the following at the `lom>` prompt:

```
lom> environment
```

FIGURE 9-1 shows some sample output from the `environment` command: the Fault LED is ON (because Fan 3 is running too slowly). All the Alarms are OFF. Fan 3 is faulty, and one of the DC inputs (in this case, input A) to the Power Supply Unit has failed.

```
lom>environmnet
Fault ON
Alarm 1 OFF
Alarm 2 OFF
Alarm 3 OFF

Fans:
1 OK speed 86%
2 OK speed 89%
3 FAULT speed 15%

PSUs:
1 In A failed
lom>
```

FIGURE 9-1 The `environment` Command Showing Fan 3 and DC Input Supply Faults

---

Note – If the fans or PSU fail on your Netra t1, please contact your local Sun Enterprise Services representative.

Viewing the LOM Device's Event Log

To see the event log, type the following at the `lom>` prompt:

```
lom> show eventlog
```

FIGURE 9-2 shows a sample event log display. Note that the first event is the oldest. In this example, the `show eventlog` command indicates that all the alarms have been set to OFF, that FAN 3 has failed, and that DC input supply A has failed. Also, the system has been put into and then out of standby mode by means of LOM commands, and before this it was reset by means of a LOM command (the `reset` command).

The only 'fatal error' is the fan 3 failure. No other 'fatal errors' have occurred. The PSU 'In A' failure is not fatal because it affects a component (the input supply) that is external to the system.

```
lom>show eventlog
    Alarm 1 OFF
    Alarm 3 OFF
    Alarm 2 OFF
    FAN 3 failed
    PSU 1 In A failed
    power off
    power on
    host reset
-
first fatal error
FAN 3 failed
lom>
```

FIGURE 9-2 Sample LOM Device Event Log (oldest event reported first)

Note – Note that the 'first fatal error' heading is always present even when the list of errors is empty.

Note – If the PSU or fans fail on your Netra t1, please contact your local Sun Enterprise Services representative.

Shortening the LOM Commands

For a full list of the commands associated with the LOM, see “A Listing of the LOM commands” on page 82. You can shorten these commands, but you must observe the following rules:

- The first character you type must be the first character of the full command
- You must use a minimum of two sequential characters
- The sequence of the characters must be unique to the command you intend to use

For example, for the `reset` command, you can type:

```
lom> re
```

Similarly, `co`, `con`, and `cons` are all valid abbreviations of the `console` command. But `power` is not a valid abbreviation of the `poweron` command, because the character sequence ‘`power`’ is also characteristic of the `poweroff` command. For the minimum abbreviation permissible for each command, see TABLE 9-1.

A Listing of the LOM commands

The LOM commands are listed in TABLE 9-1.

TABLE 9-1 LOM Commands

Command	Minimum Abbreviation	Effect
`alarmoff n`	`alarmof n`	Sets alarm <n> off. (Where n is 1, 2, or 3.) These three alarms are software flags. Alarm 3 is set to TRUE by the LOM to indicate a system lock-up. Alarms 1 and 2 are associated with no specific conditions but are available to be set by your own processes.
`alarmon n`	`alarmon n`	Sets alarm <n> on. See the description for the `alarmoff` command.
`check`	`ch`	Resets monitoring to report all failures. If a monitored component has failed, the LOM device will not continue to report the same failure. To check the status of the component, for example, after attempting to fix it, issue the `check` command. This updates the status of all monitored components.

TABLE 9-1 LOM Commands *(Continued)*

Command	Minimum Abbreviation	Effect
`console`	`co`	Returns control of the serial connection to the console.
`environment`	`en`	Displays the status of the fans, the power supply, the alarms, and the fault LED
`faulton`	`faulton`	Sets the Fault LED to On.
`faultoff`	`faultof`	Sets the Fault LED to Off.
`help`	`he`	Displays the list of LOM commands.
`poweron`	`poweron`	Powers the system on.
`poweroff`	`powerof`	Powers the system off.
`reset`	`re`	Resets the Netra t1 system.
`show model`	`sh mo`	Displays the system model.
`show hostname`	`sh ho`	Displays the system name (this command is equivalent to the UNIX `uname -n` command).
`show eventlog`	`sh ev`	Displays the LOM's event log. The event log is the list of the last 10 events to have been stored in the LOM device. The most recent event is the one at the bottom of the list.
`show escape`	`sh es`	Displays the current LOM escape sequence.
`show`	`sh`	Displays all the information available with the `show` command.
`version`	`ve`	Displays the version number of the LOM device.

Configuring the LOM to Restart the System Automatically After a Lock-up

The LOM software pre-installed on the Netra t1 (or available on the LOMlite CD) includes the `tsdog` utility. `tsdog` is a watchdog process. It 'pats' the LOM device at specified time intervals, and as long as it continues to do this the LOM device takes no action. If however, the system locks up and the LOM device therefore does not receive its usual 'pat' from the `tsdog` watchdog, then, after a timeout period, the LOM device lights the Fault LED, sends a LOM report, and (if configured to do so) resets the Netra t1 system.

By default, the `tsdog` watchdog pats the LOM every 10 seconds and the LOM device's watchdog timer times out after 40 seconds. When the watchdog timer times out, the LOM reports an event and lights the Fault LED, but it does not by default reset the system.

To make the LOM device reset the system when its watchdog timer has timed out (after not receiving a pat from the `tsdog` watchdog), you need to edit the LOM's configuration file. This file is called `lom.conf` and is stored in `/kernel/drv`.

To make the LOM restart the system automatically after a lock-up, edit the `wdog_reset` line to read:

```
wdog_reset=1
```

Note – An alternative is to type **`tsctl hwreset=on`** at the Solaris prompt. However, if you use this command, you will have to remember to repeat the command each time you boot the system.

By default the LOM attempts to disable its watchdog timer if it detects that a break signal has been sent to the system. This prevents it from restarting the system unnecessarily. If you do not want the LOM to attempt to disable its watchdog timer when a break has been sent to the system, edit the `disable_wdog_on_break` line to read:

```
disable_wdog_on_break=0
```

Similarly, by default, the LOM attempts to disable its watchdog timer if it detects that the system has undergone a ‘panic’. If you do not want the LOM to attempt to disable its `tsdog` watchdog timer after a panic, edit the `disable_wdog_on_panic` line to read:

```
disable_wdog_on_panic=0
```

Other Ways of Configuring the LOM

The LOM device takes its configuration from a file called `lom.conf`. This is stored in `/kernel/drv`.

The full list of parameters you can set in this file is given in TABLE 9-2.

TABLE 9-2 LOM Configuration File Parameters

Field	Format	Effect
`wdog_enabled`	Boolean	Enables the `tsdog` watchdog when the LOM driver loads.
`wdog_reset`	Boolean	Causes the LOM to reset the Netra t1 after a `tsdog` watchdog timeout.
`wdog_alarm3`	Boolean	Turns on software alarm 3 when the `tsdog` watchdog times out.
`wdog_timeout`	Integer	Sets the timeout for the `tsdog` watchdog. The value is in seconds. If the system locks up and the LOM device does not receive the expected ‘pat’ from the `tsdog` watchdog, then, after the timeout period that you specify, the LOM device reports an event, lights the Fault LED, and if configured to do so (see `wdog_reset` above) resets the Netra t1 system.
`serial_events`	Boolean	Causes the LOM to report events over the serial connection.
`disable_wdog_on_break`	Boolean	Causes the LOM to disable its `tsdog` watchdog if a break signal is detected on the Serial A/LOM port.
`disable_wdog_on_panic`	Boolean	Causes the LOM to try to disable the LOM watchdog after a system ‘panic’.

Each parameter must be on a separate line and must befollowed by an equals sign (=) and a value, without spaces. Where the format is Boolean, 1 means true and 0 means false.

Utilites Associated with the LOM Device

There are a number of utilities associated with the LOM device. They are stored in `/usr/sbin`.

For information about using these to perform more advance monitoring and configuration, refer to the manpages for `lomctl`(1M), `lominfo`(1M), `lomprog`(1M), lom(1M), `tsdog`(1M), `tsstate`(1M) and `tsunlock`(1M), `tsctl`(1M), `tsmonitor`(1M), `lomlited`(1M).

Changing the First Character of the LOM Escape Sequence

To change the first character of the LOM escape sequence, use the `lomctl` utility. Type:

```
# lomctl escape=X
```

where X is the character you want to use instead of '#'.

The System's Front and Back Panel LEDs

The Netra t1 contains two front panel LEDs:

- A power indicator (see FIGURE 9-3).
  This LED is lit when the system is powered on. It is not lit when the system is in standby mode.
- A fault indicator (see FIGURE 9-3).
  This LED is lit by the LOM device if the operating system locks up. When the operating system is running (in other words, when the operating system's watchdog is patting the LOM at regular intervals), the LOM turns the LED off. If the LED is flashing, then the LOM has detected a fault that requires you to take action, for example, to replace a fan or power supply unit that has failed. (You can use the LOM's `faulton` command to light this LED yourself; see TABLE 9-1.)

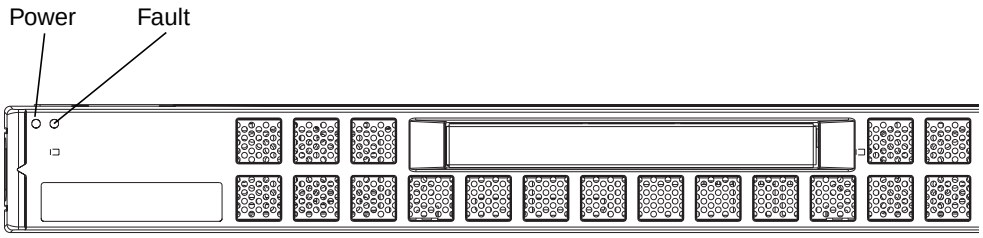

FIGURE 9-3 Front Panel Power and Fault LEDs

The Netra t1 contains four back panel LEDs (see FIGURE 9-4):

- A power indicator.
  This replicates the power indicator on the front panel.
- A fault indicator.
  This replicates the fault indicator on the front panel.
- A link indicator for each Ethernet port.
  The light comes on to indicate that a connection has been established to the hub.

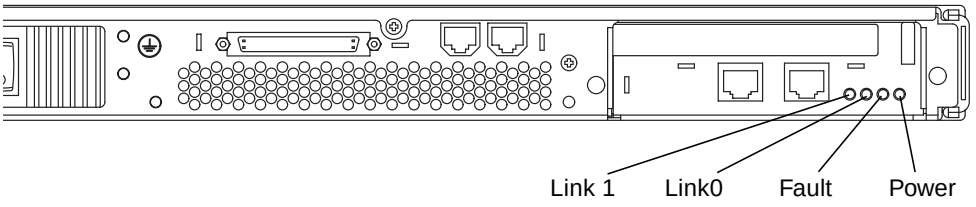

FIGURE 9-4 Back Panel Ethernet Link, Power and Fault LEDs

The Fans Monitored by the LOM Device

Event reports about the fans inside the system include the number of the fan to which they relate. Fans 1 and 2 cool the motherboard (see FIGURE 9-5), and Fan 3 cools the PCI bay. The power supply fan is monitored as part of the Power Supply Unit (PSU), therefore, if this fan fails, the LOM reports it as a PSU failure.

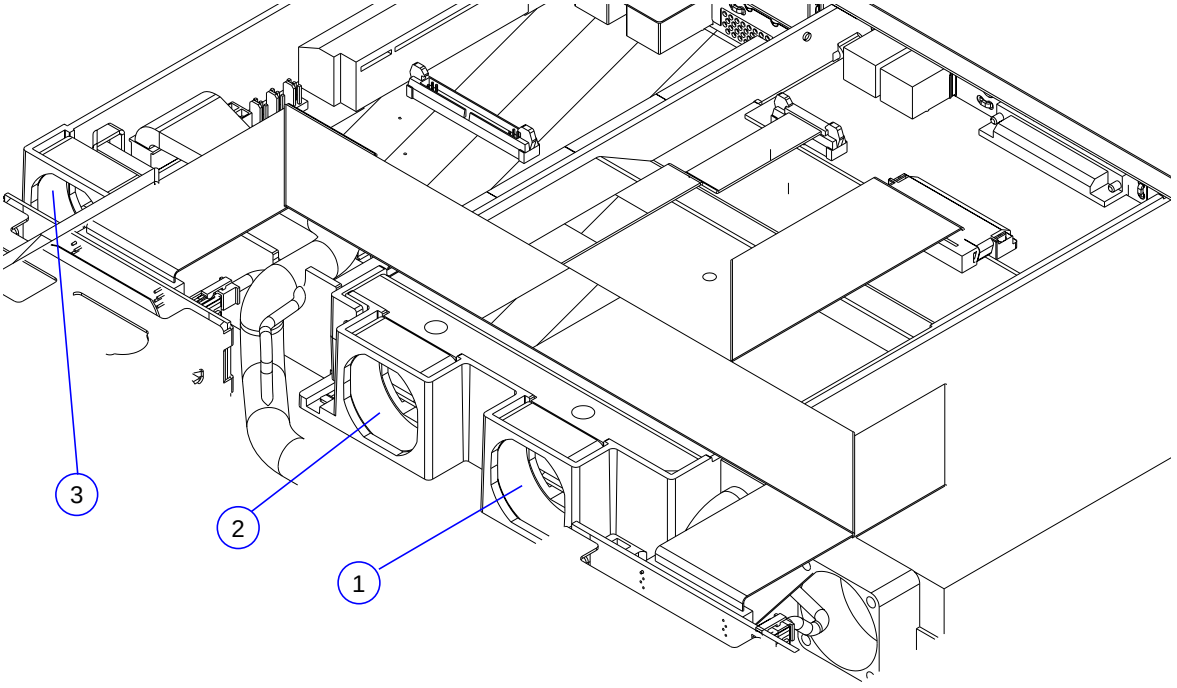

FIGURE 9-5 Locations of Fans 1, 2, and 3

To check the status of the fans:

1. **Type the LOM escape sequence (by default this is #.) to get to the `lom>` prompt.**
2. **Type the following at the `lom>` prompt:**

```
lom> environment
```

CHAPTER 10

Maintaining the System

This chapter lists the Field Replaceable Units (FRUs) and optional accessories that you might want to order for the Netra t1 during its life-time. If you ever need to replace an entire Netra t1 system, the chapter also tells you how to capture and retain the configuration information for one system and transfer it to another. (This configuration information is stored in a device on the motherboard called the Host ID chip.)

The chapter also tells you how to identify the part that needs replacing if you see a message during booting which tells you that the clock and NVRAM battery is low.

Finally, the chapter lists the settings for the jumpers on the motherboard.

The chapter contains the following sections:

- "Optional Accessories" on page 90
- "Re-using the Data in the Host ID Chip" on page 91
- "Replacing the Lithium Battery" on page 92
- "Motherboard Jumpers" on page 93

Optional Accessories

TABLE 10-1 lists the Field Replaceable Units (FRUs) and optional accessories that you might want to order for the Netra t1 during its life-time. To order any of them, contact your local Sun Enterprise Services representative.

TABLE 10-1 Orderable Options

FRUS and Optional Accessories	Sales Part Number
23-inch rack-mount kit	X6966A
24-inch rack-mount kit	X6967A
600mm rack-mount kit	X6971A
Internal CD-ROM drive	X6971A
External SCSI CD-ROM drive	X6157A
'Lights-out' Management software CD	X6972A
9 Gbyte, 7.2K RPM hard disk	X5229A
9 Gbyte, 10K RPM hard disk	X5234A
18 Gbyte, 10K RPM hard disk	X5237A
64 Mbyte memory board	X6983A
256 Mbyte memory board	X6985A
512 Mbyte memory board	X6986A
5 pack serial port adapter	X6973A
Solaris 7 media kit	XSLOMS-E1-LF
Solaris 2.6 license kit	XSOLD-E1-LF
Solaris 2.6 media kit	SOLMS-26EW999
Gigabit Ethernet card	X1141A
SunSwift Ethernet card	X1032A
Quad Fast Ethernet card	X1034A
ATM 155 MMF	X1157A
ATM 155 UTP	X1158A
PCI FC-100 FC-AL	X6729A

Re-using the Data in the Host ID Chip

If you ever need to replace an entire Netra t1, you can re-use the old system's MAC address and serial number in the new system. This information is stored on the motherboard in a removable component called the Host ID chip (see FIGURE 10-1**)**. To transfer them to a new system, do the following:

1. **Remove the Host ID chips from both the new and the old systems (to identify the chip, see** FIGURE 10-1**).**
2. **Fit the Host ID chip from the old system onto the motherboard of the new system.**

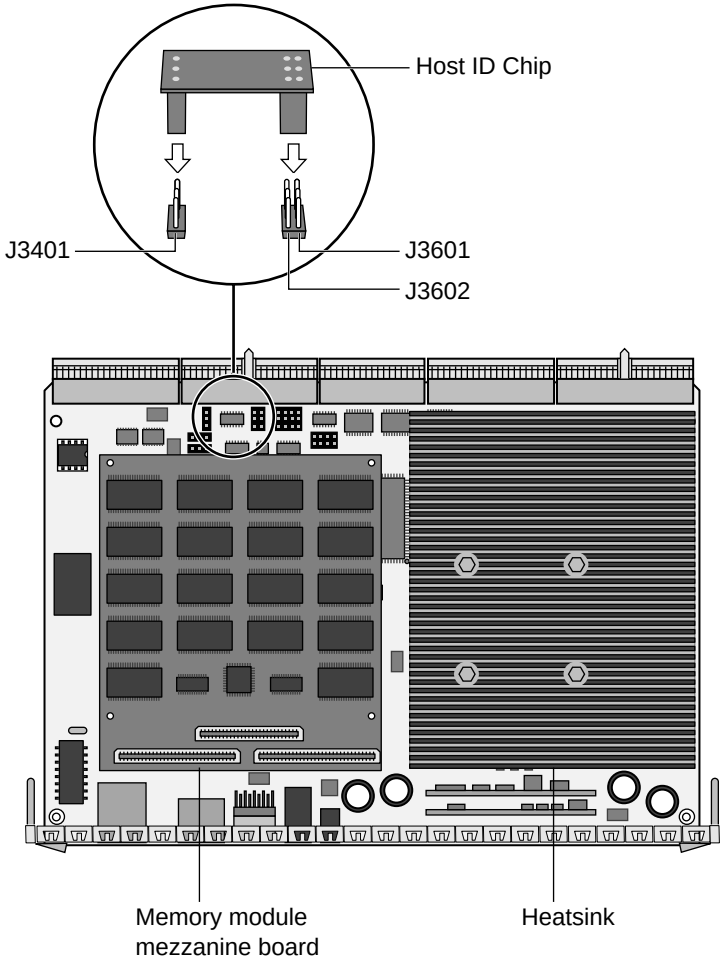

FIGURE 10-1 Location of the Host ID Chip on the Motherboard

Replacing the Lithium Battery

If you ever need to replace the lithium battery on the motherboard, you will see the following message on your console when you boot the system:

```
Warning -- Real-Time-Clock (and NVRAM) battery is low
```

If you see this message, order a new lithium battery (part number: 100-5893) from your Sun Enterprise Services representative. Take note of the caution below.

Caution – There is a danger of explosion if the lithium battery is incorrectly replaced. Replace it only with a battery of the same type as the used battery (part number: 100-5893) or with a battery of an equivalent type that has been recommended by Sun Microsystems, Inc. To replace the battery, follow the instructions supplied with the new battery. Dispose of the used battery according to the manufacturer's instructions.

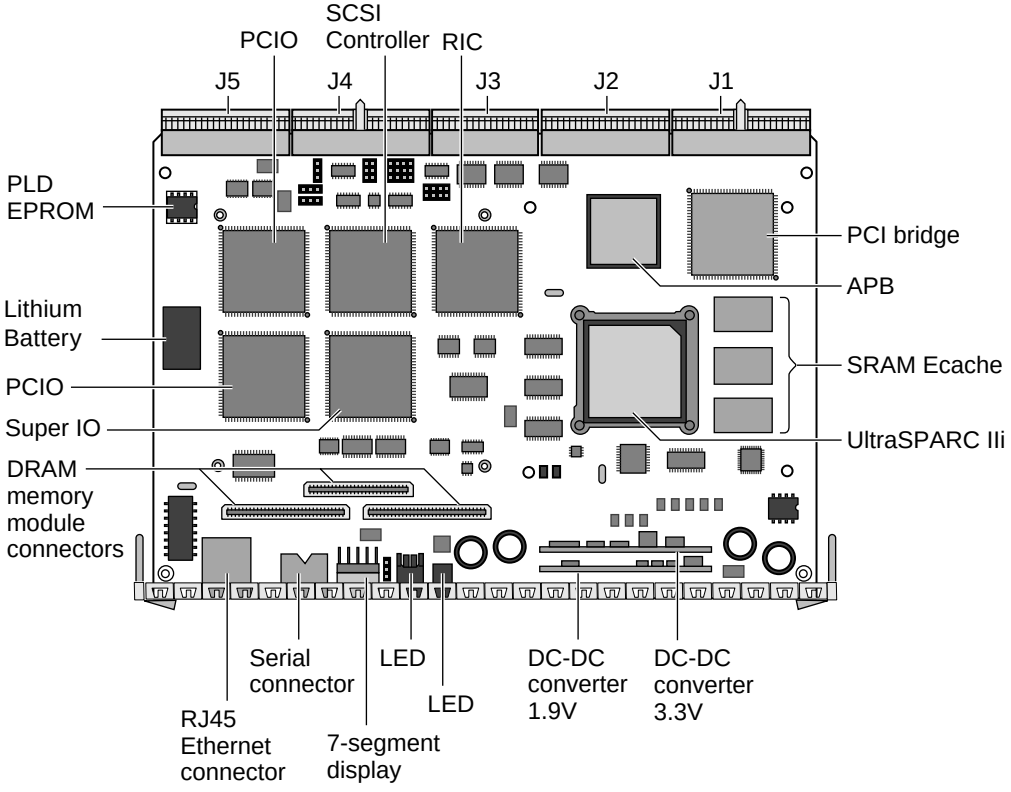

FIGURE 10-2 Motherboard Components (including the Lithium Battery)

Motherboard Jumpers

The Netra t1's motherboard contains several jumpers. We do not recommend you change any of their settings. However, for reference, the factory default settings are listed in TABLE 10-2 and the locations of the jumpers are shown in FIGURE 10-3.

TABLE 10-2 Jumper Settings

Jumper	Setting	Description	Default
J1401	2-3	Enable Flash Write	Installed
	1-2	Disable Flash Write	
J1501		Joint Test Action Group (JTAG) test header	No jumper provided*
J1502	2-3	Scan Clock	
	1-2	External Clock	Installed
J3301	2-3	Enable Loopback Reset	Installed
	1-2	Disable Loopback Reset	
J3302	2-3	Enable User Flash Write	Installed
	1-2	Disable User Flash Write	
J3303	2-3	Boot from System Flash	Installed
	1-2	Boot from ROM Emulator	
J3304	2-3	Enable Boot from User Flash	Installed
	1-2	Disable Boot from User Flash	
J3306	2-3	7-segment display bias	Installed
	1-2		
J3601 J3602 J3401		Used for Host ID PROM mounting header	
J4703	1-2 2-3	Programmable Logic Device (Test Data Out) Compact PCI (Test Data Out)	No jumper provided*
J1001	1-2	SCSI active enable terminator	Installed
	2-3	SCSI active disable terminator	
J1002	1-2	Terminator power enable	Installed
	2-3	Terminator power disable	

* Where no jumper is provided, the jumper is used only during manufacturing and is removed before shipping.

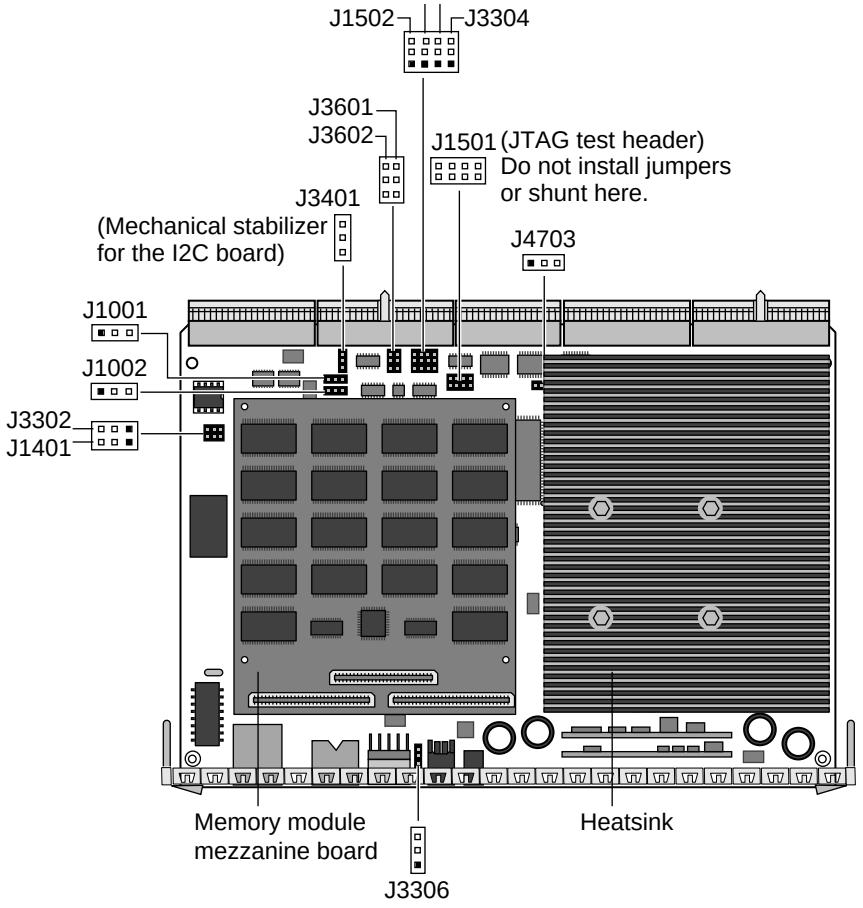

FIGURE 10-3 Motherboard Jumper Locations

CHAPTER 11

Troubleshooting

This chapter lists some problems that you might encounter setting up or using the Netra t1 system and tells you how to solve them.

Note – If you are not using the factory-configured system software (for example, because you have installed a different operating system over the pre-installed software), make sure you apply the patches listed in Chapter 8.

If you cannot find a solution to your problem in this chapter, contact your local Sun Enterprise Services representative.

The chapter contains information to help you when you:

- "Cannot Set up a Console Connection to the Netra t1" on page 96
- "Cannot Boot from the Internal CD-ROM drive" on page 96
- "Cannot Plug the Network Cable into a Port on a PCI Card" on page 96
- "Cannot Return to Solaris after a Break to the OBP Prompt" on page 97
- "Cannot Get to the lom> Prompt Using the (#.) Escape Sequence" on page 97
- "Cannot Install Solaris from the Solaris 2.6 hw3 CD" on page 97
- "Cannot Connect to the Netra t1 Using the Serial B Port" on page 97
- "Cannot Use a Terminal Window Without Seeing Interrupt 12 Messages" on page 97
- "Cannot Use a Modem Without Occasional System 'Panics'" on page 97

Cannot Set up a Console Connection to the Netra t1

The Netra t1's serial port pinouts are listed in Chapter 6. Check that they are correct for the device (that is, the terminal or terminal server) that you are connecting to the Netra t1.

Cannot Boot from the Internal CD-ROM drive

If you do not have patch 108673-04 applied and you have Solaris installed, then apply the patch and try booting again from the CD-ROM drive.

If you do not have patch 108673-04 applied but you have no operating system installed, do the following:

1. **At the ok prompt, type:**

```
ok setenv auto-boot? false
```

2. **Next, type:**

```
ok reset-all
```

3. **If you had the `auto-boot?` environment variable set to `true` originally, return it to `true` by typing:**

```
ok setenv auto-boot? true
```

4. **When the system has finished performing the reset, wait for 30 seconds, then try booting again from the CD-ROM drive.**
5. **If this was not successful, check that the CD-ROM drive and cables are properly seated (see Chapter 4).**

Cannot Plug the Network Cable into a Port on a PCI Card

Make sure that the PCI card is seated horizontally in its connector. It must not sit at an angle (see Chapter 4).

Cannot Return to Solaris after a Break to the OBP Prompt

If you experience this problem, return to Solaris by rebooting the system. Then apply patch 108620-04.

Cannot Get to the lom> *Prompt Using the (#.) Escape Sequence*

Check whether the first character of the '#.' escape sequence has been changed (this is a user-configurable value). To check the current value, type the following from the Solaris prompt:

```
# lominfo info
```

The information that this command displays includes the 'serial escape character'. If this is not '#', then try using whatever character is currently specified.

If you still cannot get to the lom> prompt, make sure you have packages SUNWlomu, SUNWlomr, and SUNWlomm loaded. If you have installed new operating system software over the software that was pre-installed on your Netra t1 system, you must re-install the LOM software from an orderable CD (part number: X6972A).

Cannot Install Solaris from the Solaris 2.6 hw3 CD

To install Solaris 2.6 on to the Netra t1, you need the supplementary Solaris Operating Environment Installation CD (part number: 704-6914-10). For more information, see Chapter 8. Note that this CD is supplied with the Netra t1.

Cannot Connect to the Netra t1 Using the Serial B Port
Cannot Use a Terminal Window Without Seeing Interrupt 12 Messages
Cannot Use a Modem Without Occasional System 'Panics'

If you experience any of these problems, please contact your local Sun Enterprise Services Representative to obtain patch 106533-xx (for Solaris 2.6) or patch 107026-xx (for Solaris 7). These patches are not available on SunSolve.

When you have applied the correct patch for your operating system, boot the system by typing:

```
ok boot -r
```

Patch 106533-xx creates new device nodes (`/dev/term/a` and `/dev/term/b`) for the Netra t1's serial ports. When you boot with the `-r` option, these new device nodes are included in the rebuilt device tree.

PART III Appendices

APPENDIX **A**

Installing Additional Memory

This appendix tells you how to add a second memory board to the current memory board installed in your system or how, alternatively, to install a stack of four 256 Mbyte memory boards into your system.

This appendix contains the following sections:

- "Installing a Second Memory Board" on page 102
- "Installing 4 x 256 Mbyte Memory Boards" on page 107

Note – Do not install memory boards in stacks of three. These boards can only be installed singly or in stacks of two or four. Only boards of part number 370-4155 can be installed in stacks of four (see "Installing 4 x 256 Mbyte Memory Boards" on page 107). In a 2-stack configuration, you can combine Netra t1 memory boards of different capacities (64, 256, or 512 Mbytes).

Caution – The components on the motherboard and memory boards are extremely sensitive to static electricity. Wear an anti-static wrist strap connected to an earthing point during installation. Failure to comply may result in damage to the equipment.

Installing a Second Memory Board

This section tells you how to install a second memory board on top of the existing memory board in your system. The boards you can install in this way are:

- 64 Mbyte memory board (part number: 595-5314; sales part number: X6983A)
- 256 Mbyte memory board (part number: 370-4155; sales part number: X6985A)
- 256 Mbyte memory board (part number: 595-5097; not available for purchase)
- 256 Mbyte memory board (part number: 370-4096; not available for purchase)
- 512 Mbyte memory board (part number: 595-5316; sales part number: X6986A)

Note – Do not install memory boards in a stack of three. These boards can only be installed singly or in twos. The 256 Mbyte board with part number 370-4155 is the only one that can be installed in a stack of four.

Materials and Tools Required

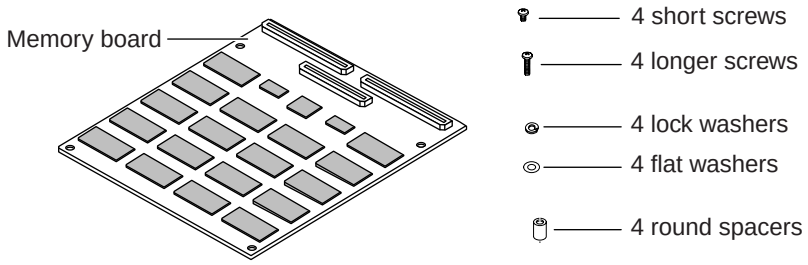

FIGURE A-1 The 2-Stackable Memory Board Kit

The packaging containing your new memory board contains the following (see FIGURE A-1):

- One memory board
- Four plastic spacers
- Four short screws
- Four longer screws
- Four lock washers
- Four flat washers

▼ To Install a Second Memory Board

Caution – The components on the motherboard and memory boards are extremely sensitive to static electricity. Wear an anti-static wrist strap connected to an earthing point during installation. Failure to comply may result in damage to the equipment.

1. **Remove the Netra t1 system cover (see “Opening the Netra t1 System” on page 23 in Chapter 4).**
2. **Lift out the processor cover located in the rear center of the unit (see** FIGURE A-2**).**

   Make sure you slide the processor cover tabs from under the rear I/O card before lifting the processor cover away from the system.

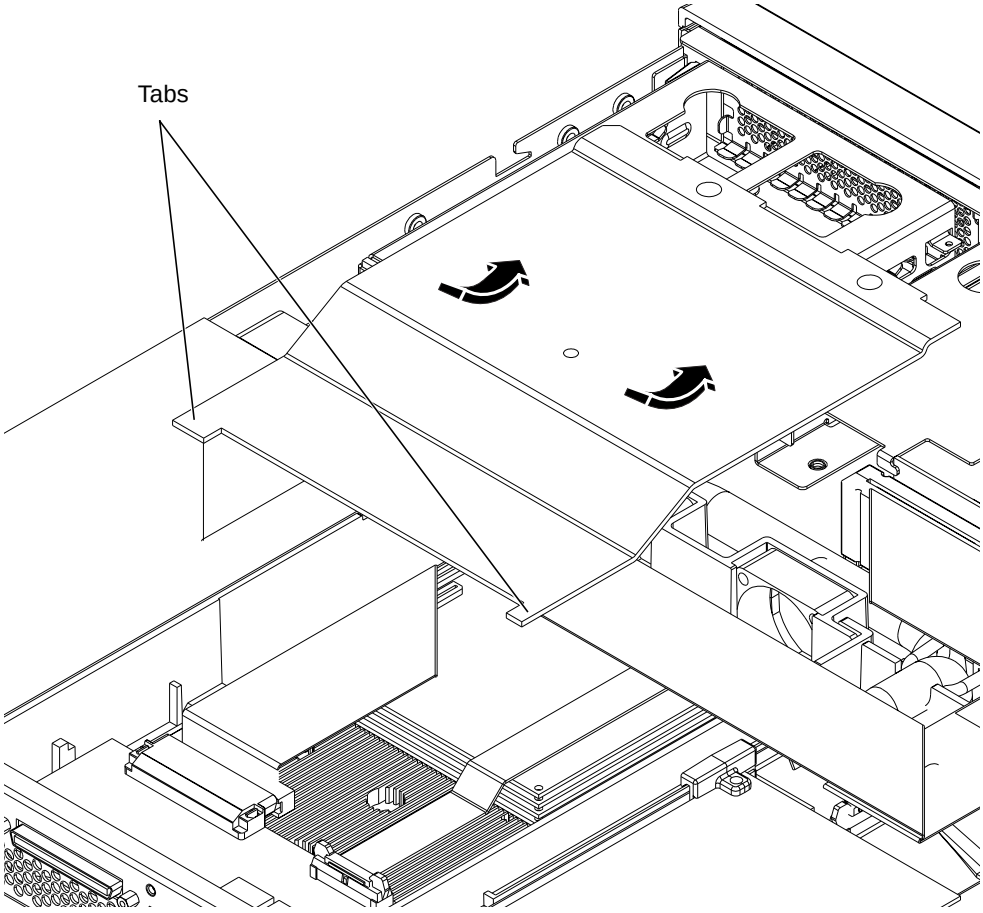

FIGURE A-2 Lifting out the Processor Cover

3. **Unplug the serial and SCSI cables from the rear I/O board.**

4. **Using a Phillips No.1 screwdriver, remove the screws and washers from the base memory board (see** FIGURE A-3 **and** FIGURE A-4**).**

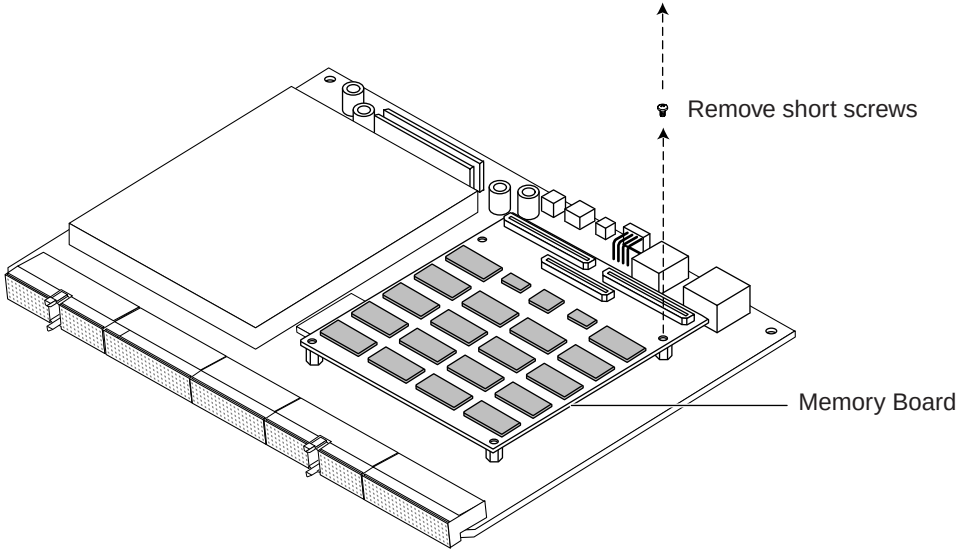

FIGURE A-3 Removing the Mounting Screws from the Currently Installed Memory Board

5. **Position the new spacers over the screw holes (see** FIGURE A-4**).**

6. **Insert the new, longer screws with their washers through the holes in the new board (see** FIGURE A-4**).**

   Place the spring washer on the screws first, and then the plain washer.

7. **Position the second memory board above the base memory board so that the connectors line up and the screws pass through the spacers (see** FIGURE A-4**).**

8. **Engage the screws in their threads to ensure the board is in the correct position.**

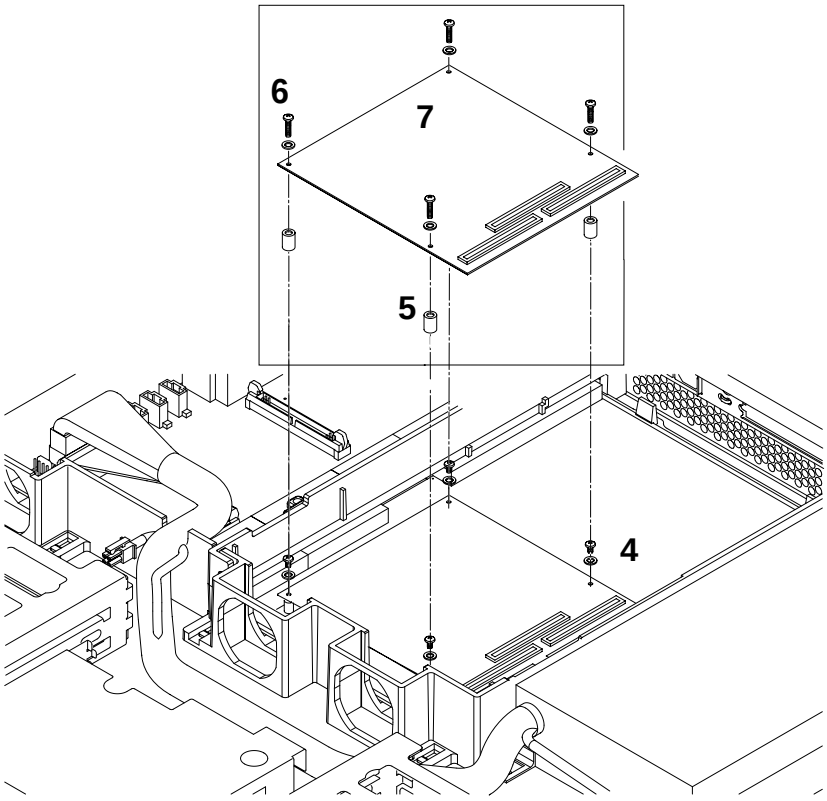

FIGURE A-4 Removing the Old Screws and Inserting the New Ones

9. Press down firmly on all three memory board connectors until they are firmly seated in the connectors on the board beneath (see FIGURE A-5**).**

You might find it helpful to seat the middle connector properly before the other two connectors. You will feel a slight click as the connectors engage.

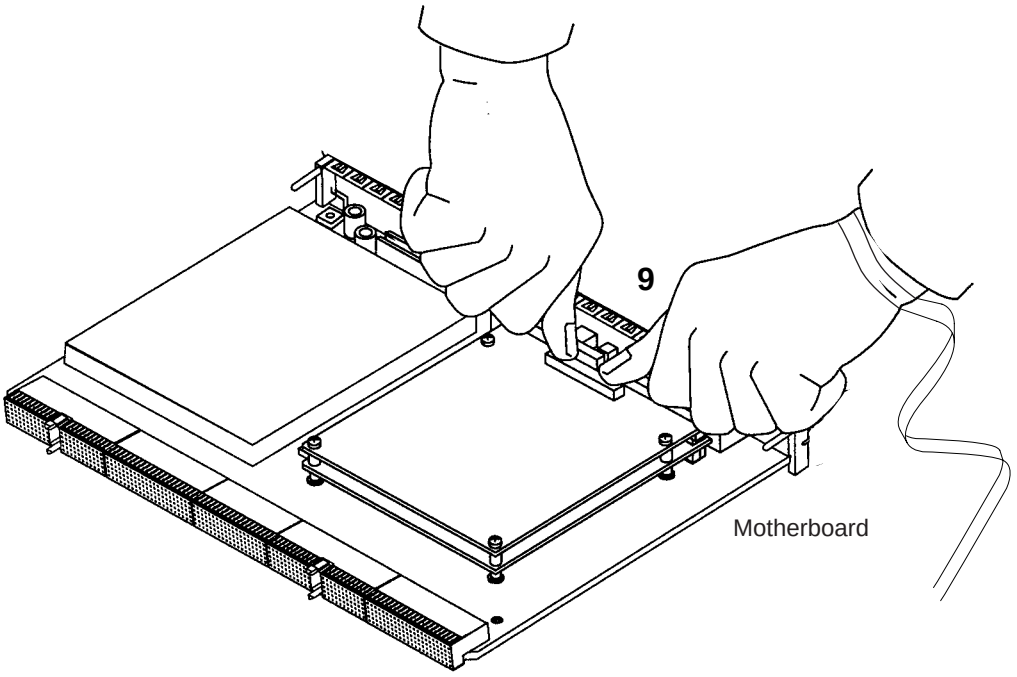

FIGURE A-5 Seating the Second Memory Board

Caution – Although it is necessary for the connectors to be properly seated, you must not apply excessive pressure to them. If you do, you might cause micro-fractures on the motherboard which can impair the operation of the board.

10. **Tighten the securing screws so that the boards sit firmly on the motherboard.**

    The recommended tightening torque is 0.3 Nm.

11. **Replace the processor cover which you removed in Step 2.**

    When you do this, make sure that you put the tabs of the processor cover back into their original position underneath the rear I/O card.

Installing 4 x 256 Mbyte Memory Boards

This section tells you how to install a stack of four 256 Mbyte memory boards.

Note – The boards you must use for the 4-stack memory installation have the part number 370-4155. Other 256 Mbyte memory boards (those with part numbers 370-4096 and 595-5097) cannot be included in a 4-stack configuration. The boards you must use are identifiable by a sticky label saying ‘4-stack only’.

Note – Do not install memory boards in stacks of three. If you do not want to install four boards into a system, you can install the boards either singly or in twos.

Materials and Tools Required

The packaging containing your 4-stackable 256 Mbyte memory board includes a kit (part number 540-4532-02) containing the following (see FIGURE A-6):

- Four square spacers
- Four lock washers
- Four flat washer
- Four long screws (11/16 inch; required only for 4-stack configurations)
- Four round plastic spacers (required only for 2-stack configurations)
- Four short screws (3/16 inch; required only for single-board configurations)
- Four medium length screws (3/8 inch; required only for 2-stack configurations)

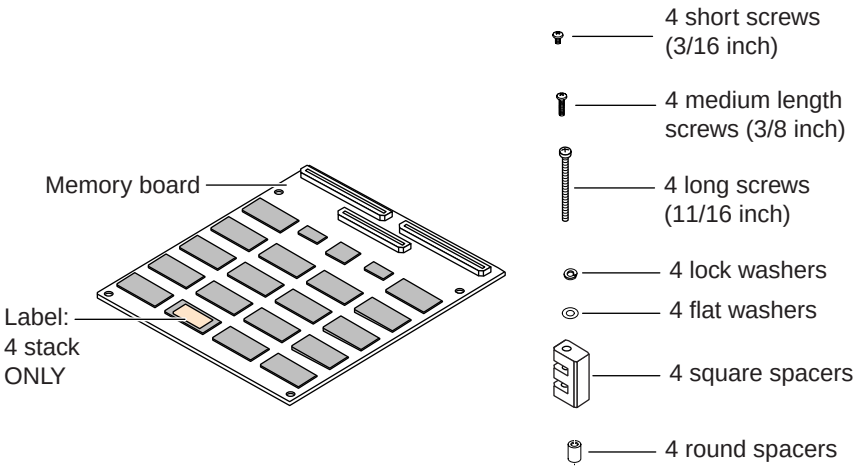

FIGURE A-6 The 4-Stackable Memory Board Kit

To install a stack of four boards, you need four memory board kits. To order a single kit from your Sun Enterprise Services representative, quote the sales part number X6985A.

▼ To Install a Stack of Four Memory Boards

1. **Remove the Netra t1 system cover (see “Opening the Netra t1 System” on page 23 in Chapter 4).**

2. **Lift out the processor cover located in the rear center of the unit (see** FIGURE A-7**).**

   Make sure you slide the processor cover tabs from under the rear I/O card before lifting the processor cover away from the system.

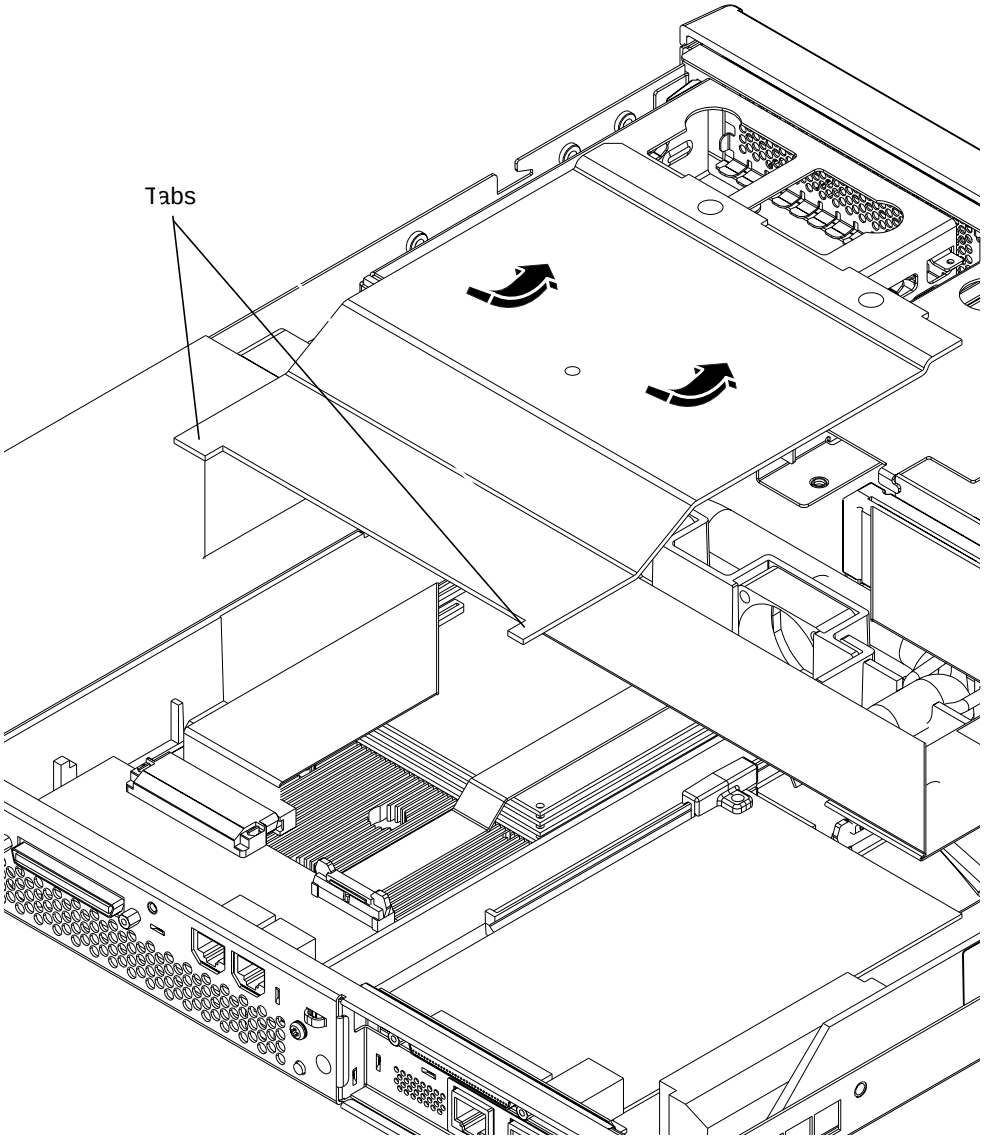

FIGURE A-7 Lifting out the Processor Cover

3. **Using a Phillips No.1 screwdriver, remove the screws and washers from the base memory board (see** FIGURE A-8**).**

   If you intend to replace the base memory board, lift out the board that is currently installed. Otherwise, leave the current board seated in the connectors on the motherboard but not screwed in.

Note – If you are making a 4-stack (1 Gbyte) configuration, the base board and all other boards in the stack must be of part number 370-4155.

For purposes of illustration, the board you use as the base board will be called Board A, Board B will be the board you put on top of Board A, Board C will be the one you put on top of Board B, and Board D will be the one at the top of the stack.

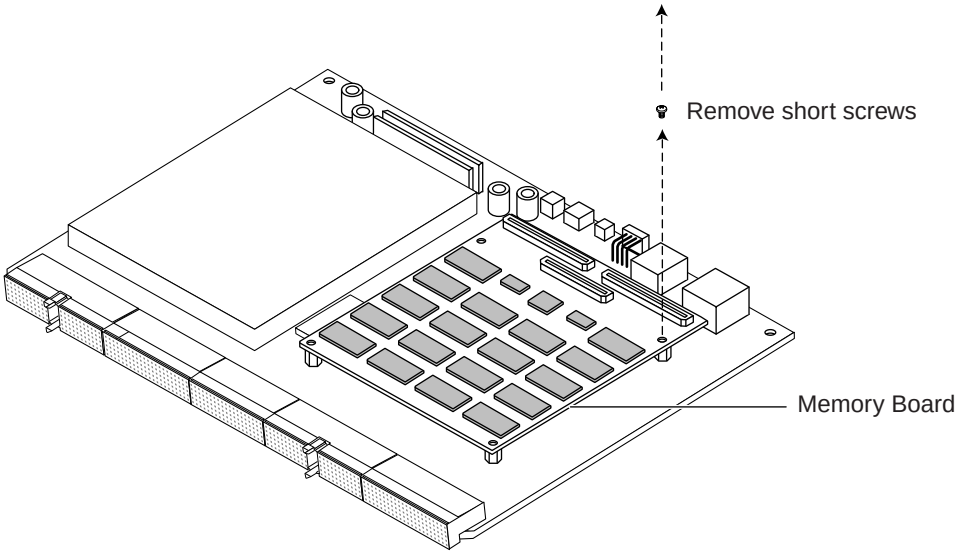

FIGURE A-8 Removing the Mounting Screws from the Currently Installed Memory Board

4. **If you are replacing the currently installed base memory board, align the connectors of the new base board with the memory board sockets on the Netra t1's motherboard.**

   Press home fully the connectors using your thumbs. The connectors need to be properly seated (see FIGURE A-9). You might find it helpful to seat the middle connector properly before the other two connectors.

.

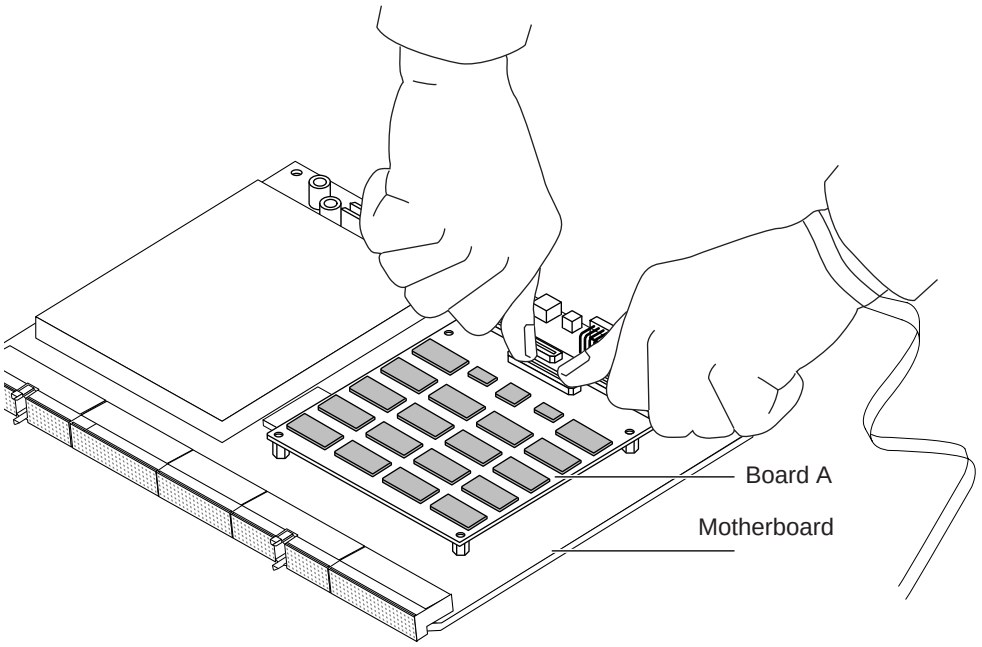

FIGURE A-9 Seating a Single Memory Board on the Netra t1's Motherboard

Caution – Although it is necessary for the connectors to be properly seated, you must not apply excessive pressure to them. If you do, you might cause micro-fractures on the motherboard which can impair the operation of the board.

5. **Position the connectors of one memory board (Board C) above the memory board connector sockets of another memory board (Board B) in a piggy-back style, then press down the connectors using your thumbs until they are seated.**

   You might find it helpful to seat the middle connector properly first (see FIGURE A-10).

   Assemble Boards B and C first, *before* you connect them to Board A.

Caution – Place the memory boards on ESD foam during this assembly.

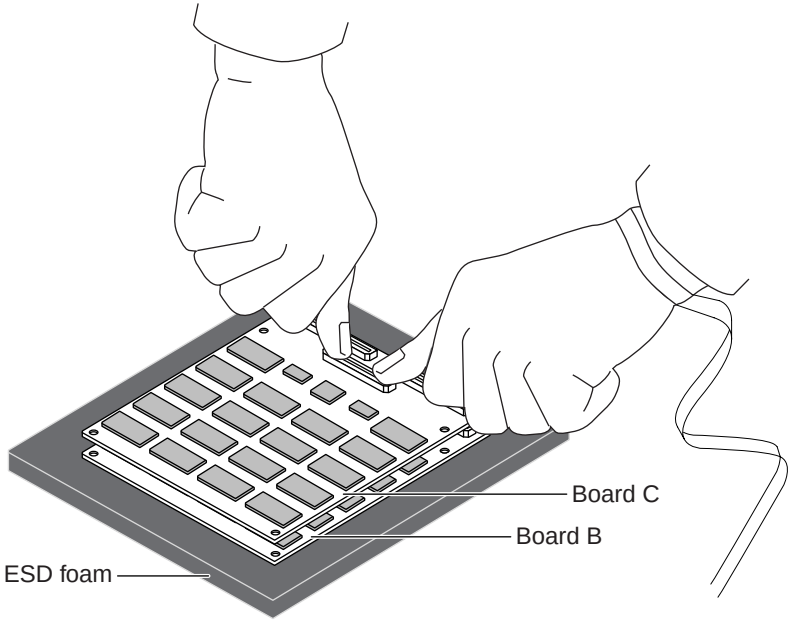

FIGURE A-10 Stacking the Third Memory Board on Top of the Second

6. **Insert the four plastic spacers and align them with the mounting holes on memory Boards B and C (see** FIGURE A-11**).**

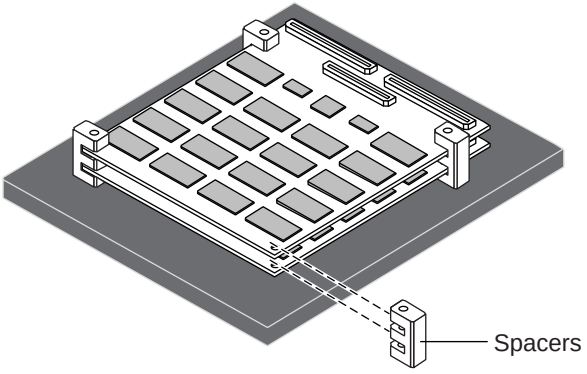

FIGURE A-11 Aligning the Four Plastic Spacers with the Mounting Holes

7. **Carefully transport the memory boards (boards B and C) with spacers onto memory board A (see** FIGURE A-12**).**

   Follow the procedure described in Step 5 to mount the assembled Boards B and C (with spacers inserted) onto memory Board A.

   Hold the spacers, if necessary, so that they do not move out of position.

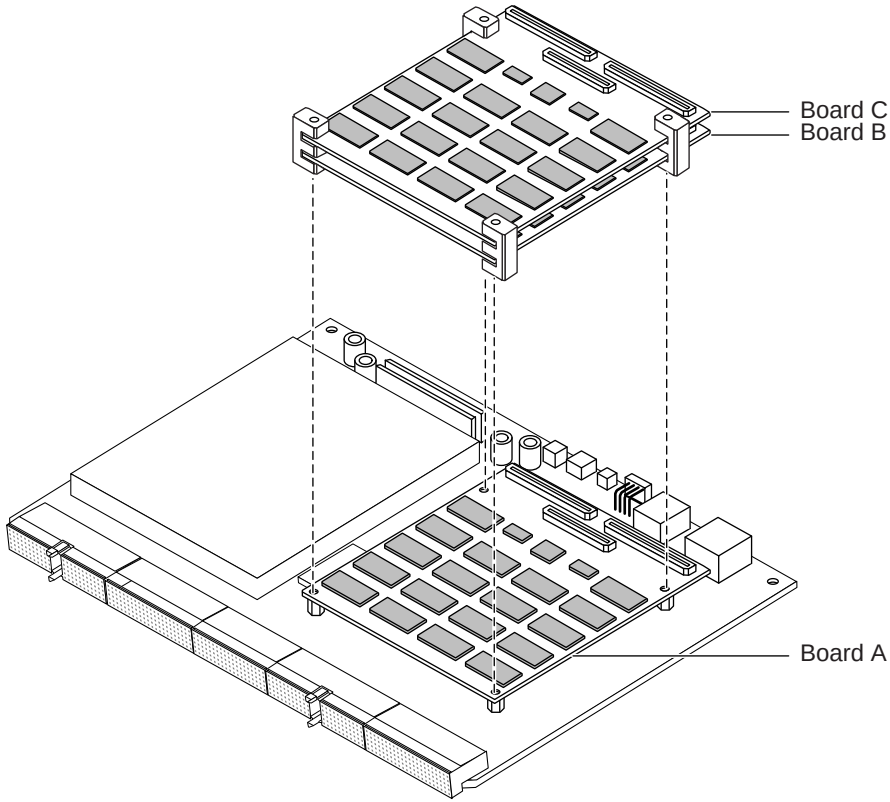

FIGURE A-12 Mounting the Second and Third Boards onto the Base Memory Board

8. **Align the connectors of Board D to the sockets of Board C, but do not press down yet to seat Board D (see** FIGURE A-13**).**

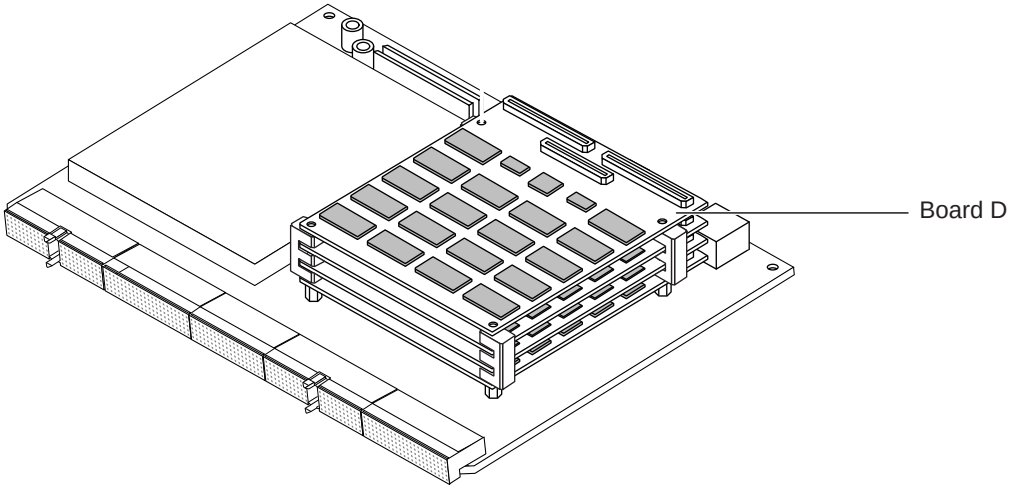

FIGURE A-13 Four Stacked Memory Boards on the Netra t1 Motherboard

9. **Insert each screw into one lock washer and one flat washer, then drop the screws (with the washers) into the aligned mounting holes of the memory boards and the plastic spacers (see** FIGURE A-14**).**

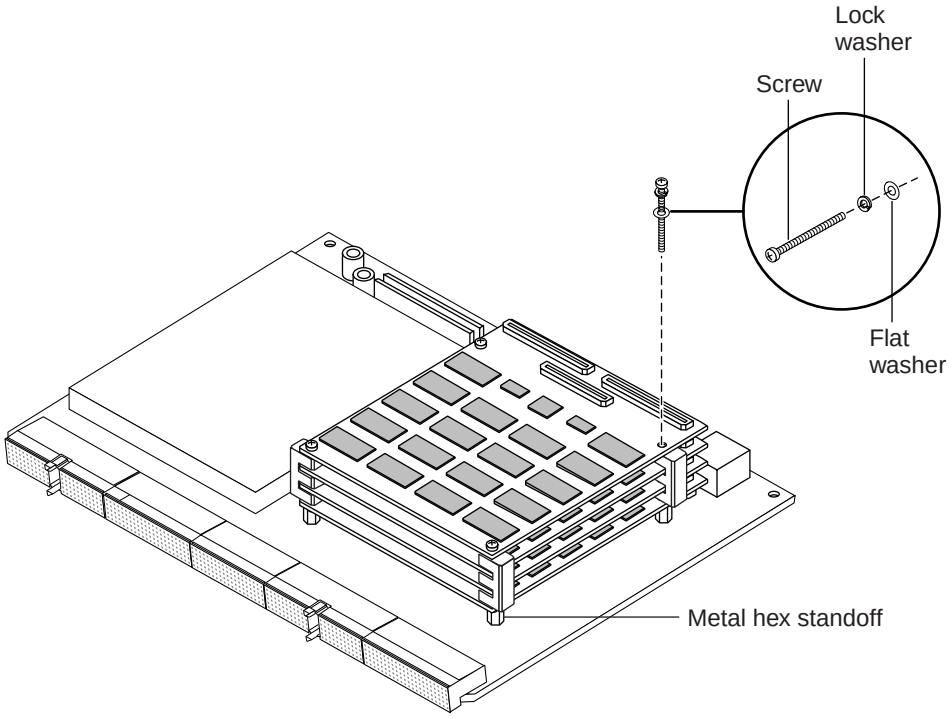

FIGURE A-14 Dropping the Screws into the Aligned Mounting Holes

10. **Using your fingers, turn all four screws until they take up just the first one or two threads in the metal hex standoffs (see** FIGURE A-14**).**

    This helps to align the connectors of Board D with the sockets of Board C, preventing any sideways movement of the stack when you press home the connectors of Board D.

11. **Now press home fully the connectors of Board D.**

    You might find it helpful to seat the middle connector properly before the other two connectors.

12. **Tighten the screws into the metal hex standoffs so that the stack sits firmly on the motherboard.**

    Tighten each screw a little at a time to avoid bending and possibly damaging any of the boards. (The recommended tightening torque is 0.3 Nm.)

13. **Replace the processor cover which you removed in Step 2.**

    Make sure that you put the tabs on the processor cover back into their original position underneath the rear I/O card.

APPENDIX **B**

Installing a PCI Card

This appendix tells you how to install a PCI card into the Netra t1 system. For a list of the PCI cards available for the Netra t1, see Chapter 10.

This appendix contains the following sections:

- "To Prepare the System for Installation" on page 118
- "To Install the Card" on page 121

Caution – The components on the motherboard and PCI cards are extremely sensitive to static electricity. Wear an anti-static wrist strap connected to an earthing point during installation. Failure to comply may result in damage to the equipment.

▼ To Prepare the System for Installation

Note – If you are going to install an internal CD-ROM drive (see “Installing a CD-ROM Drive” on page 27 in Chapter 4), do so before you install the PCI card. Otherwise you will have to remove the PCI card again.

---

1. **Remove the Netra t1 system cover (see “Opening the Netra t1 System” on page 23 in Chapter 4).**

2. **Lift out the processor cover located in the rear center of the unit (see** FIGURE B-1**).**

   Make sure you slide the processor cover tabs from under the rear I/O card before lifting the processor cover away from the system.

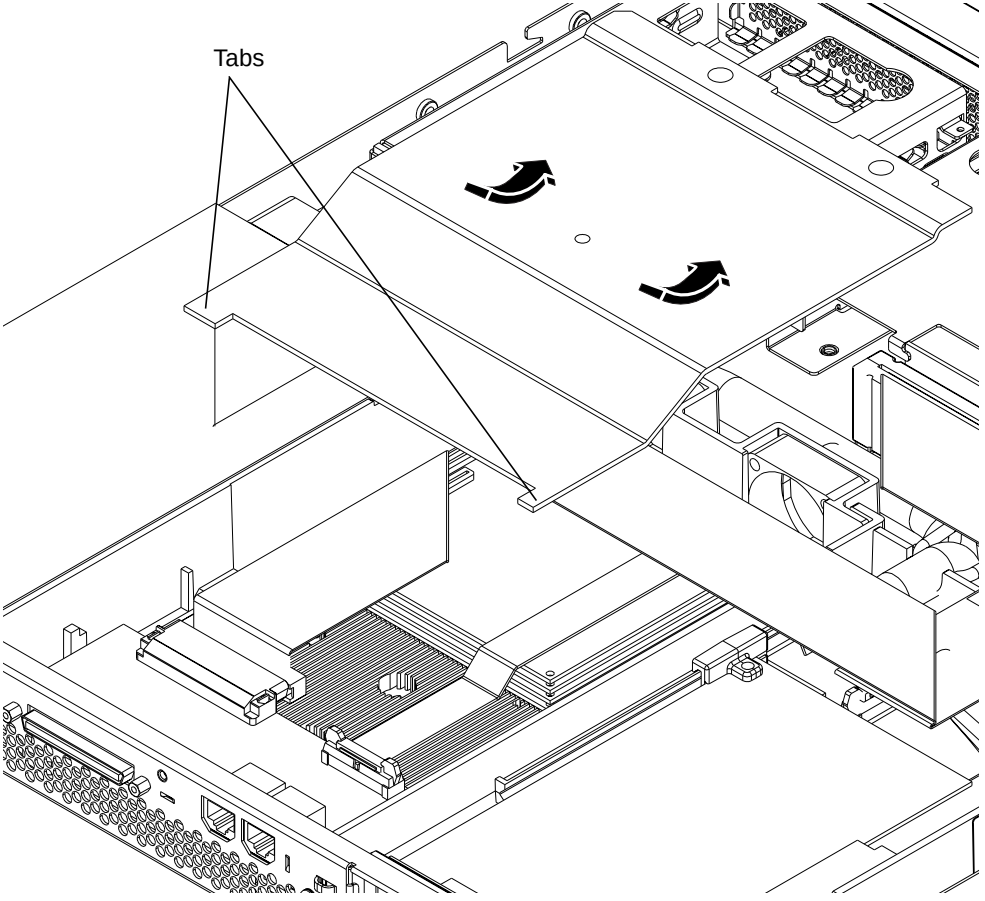

FIGURE B-1 Lifting out the Processor Cover

3. **If the system already contains a PCI card, unclip the slide retainer from the edge of the card (see** FIGURE B-2**).**

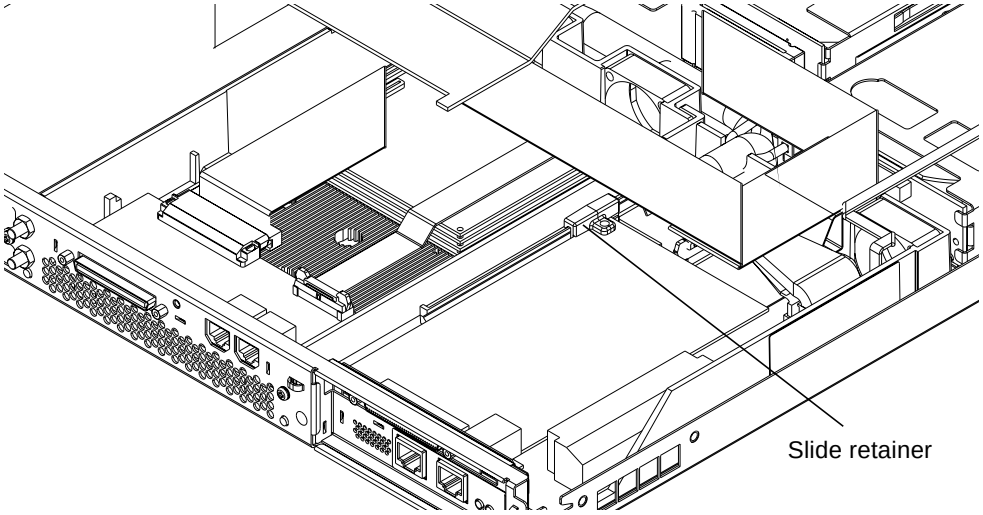

FIGURE B-2 Unclipping the Slide Retainer

4. **Remove the mid baffle. To do this:**

   a. **Remove the screw at the rear of the unit and push the mid baffle towards the drive bays (see** FIGURE B-2**).**

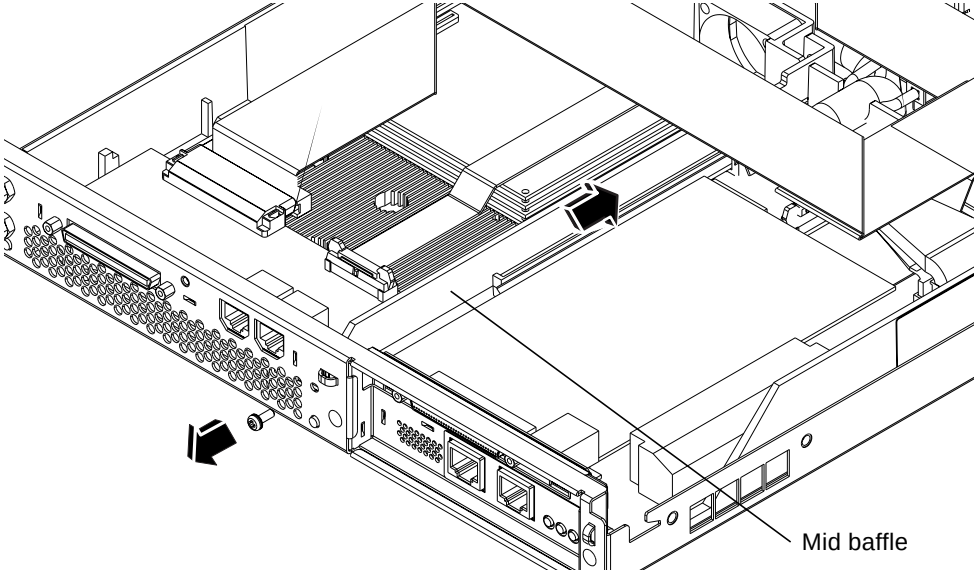

FIGURE 11-1 Removing the Rear Screw and Pushing the Mid Baffle Towards the Front

b. Lift the mid baffle out of the unit (see FIGURE B-3**).**

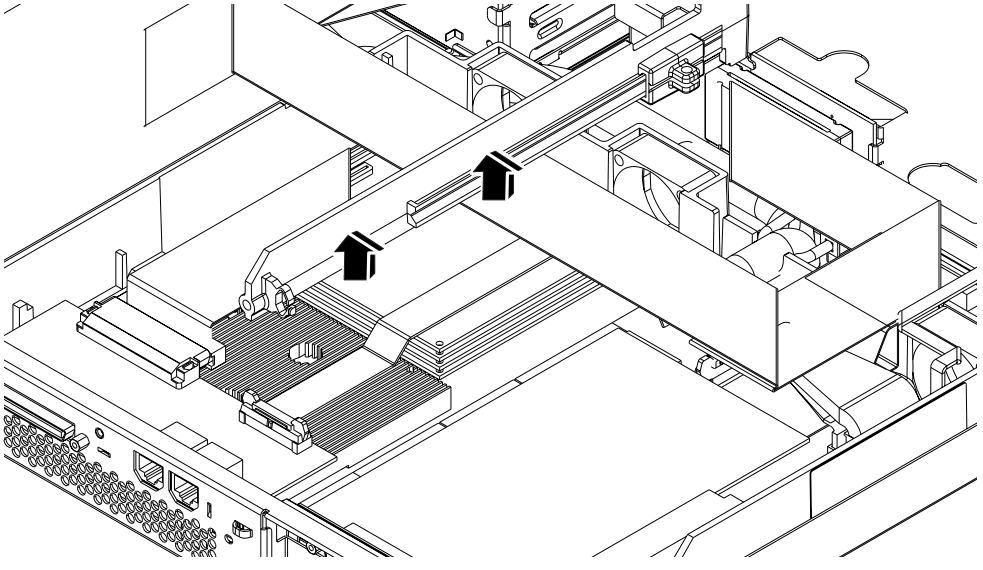

FIGURE B-3 Lifting Out the Mid Baffle

5. Remove the blanking panel or the PCI card currently occupying the PCI slot (see FIGURE B-4**).**

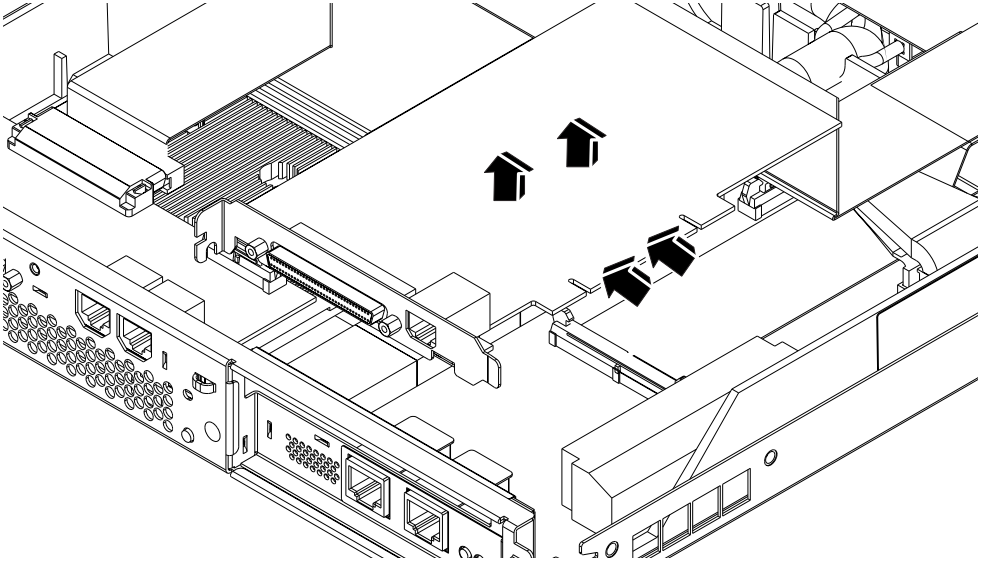

FIGURE B-4 Removing a PCI Card

▼ To Install the Card

1. **Insert the PCI card into the PCI connector.**

   Make sure you fit the PCI card into the PCI connector so that it remains in a horizontal plane (see FIGURE B-5), otherwise you might have difficulty accessing the PCI card's ports.

Note – Make sure the PCI card sits horizontally in its connector.

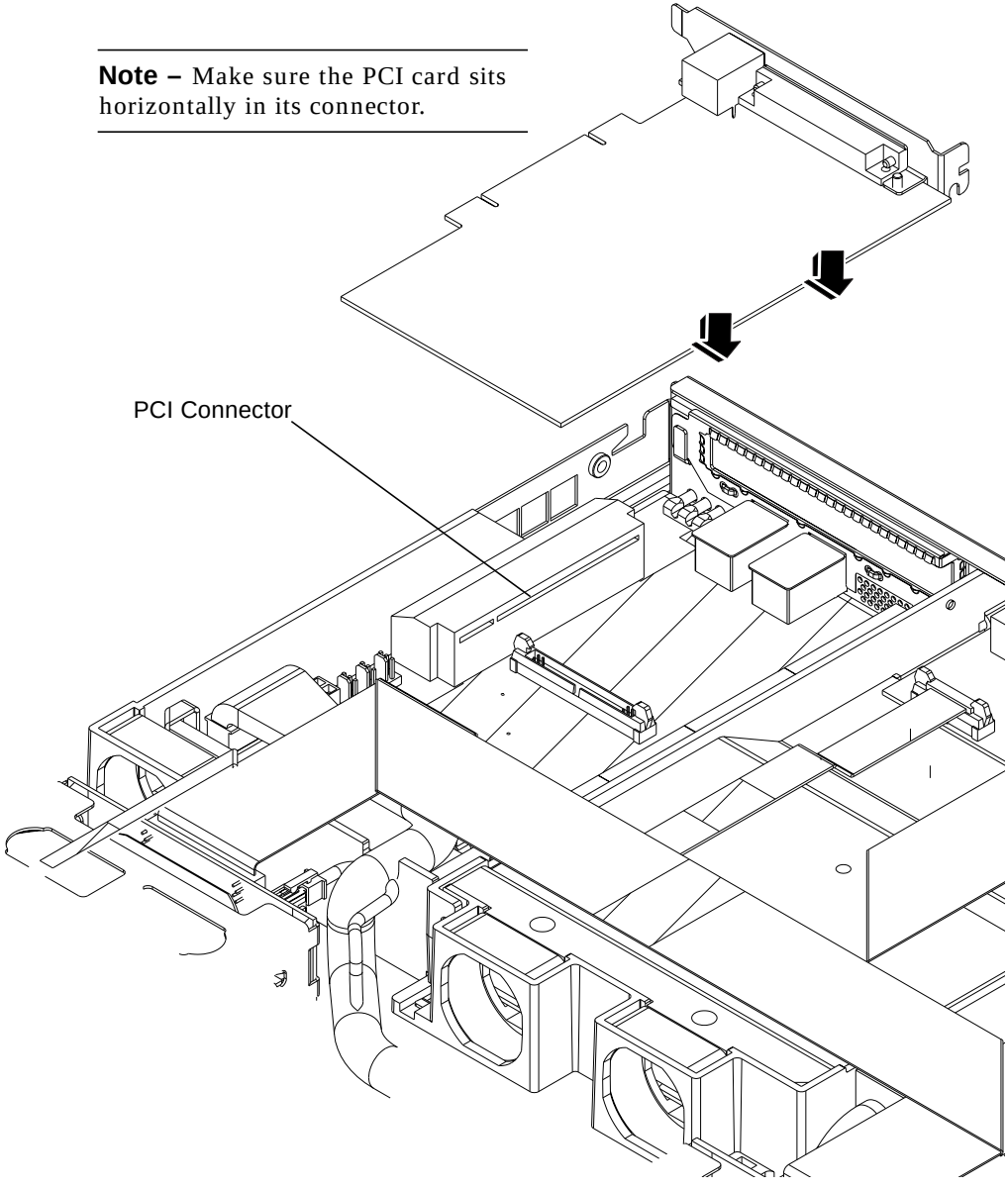

FIGURE B-5 Installing a PCI Card (viewed from the front)

2. **Replace the mid baffle with the slide retainer attached (see** FIGURE B-6**).**
   Secure it with the rear screw.

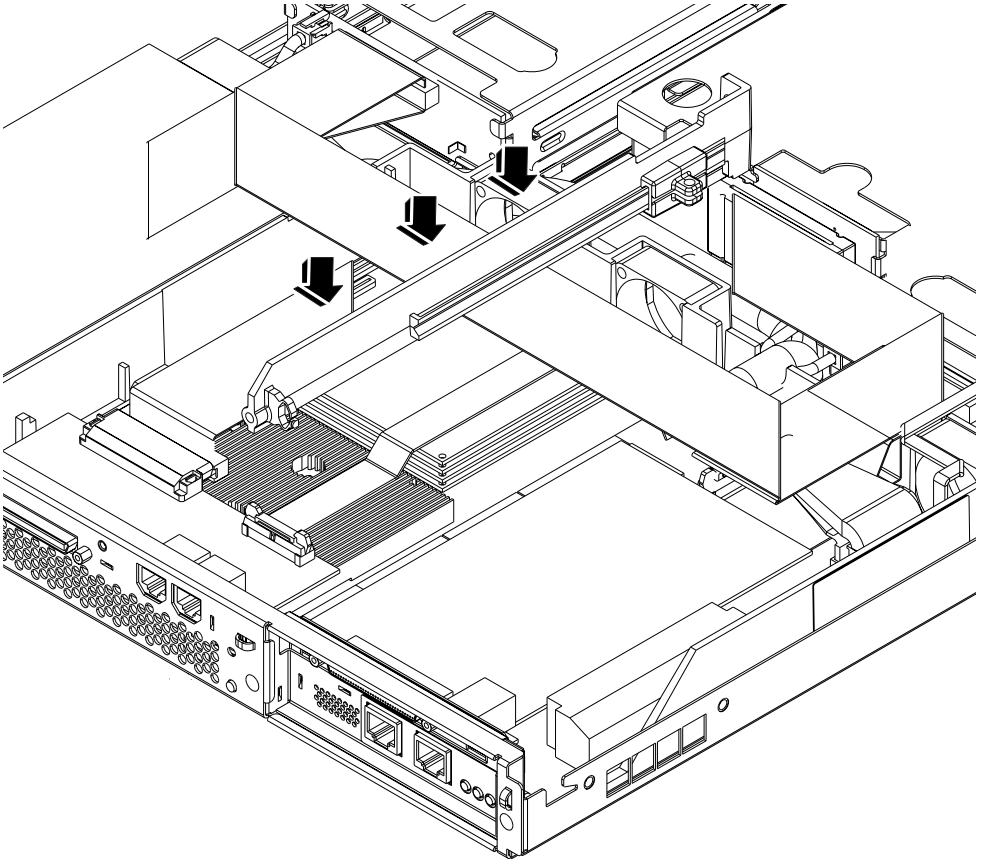

FIGURE B-6 Replacing the Mid Baffle

3. **Push the slide retainer forward to hold the corner of the PCI card in place (see** FIGURE B-7**).**

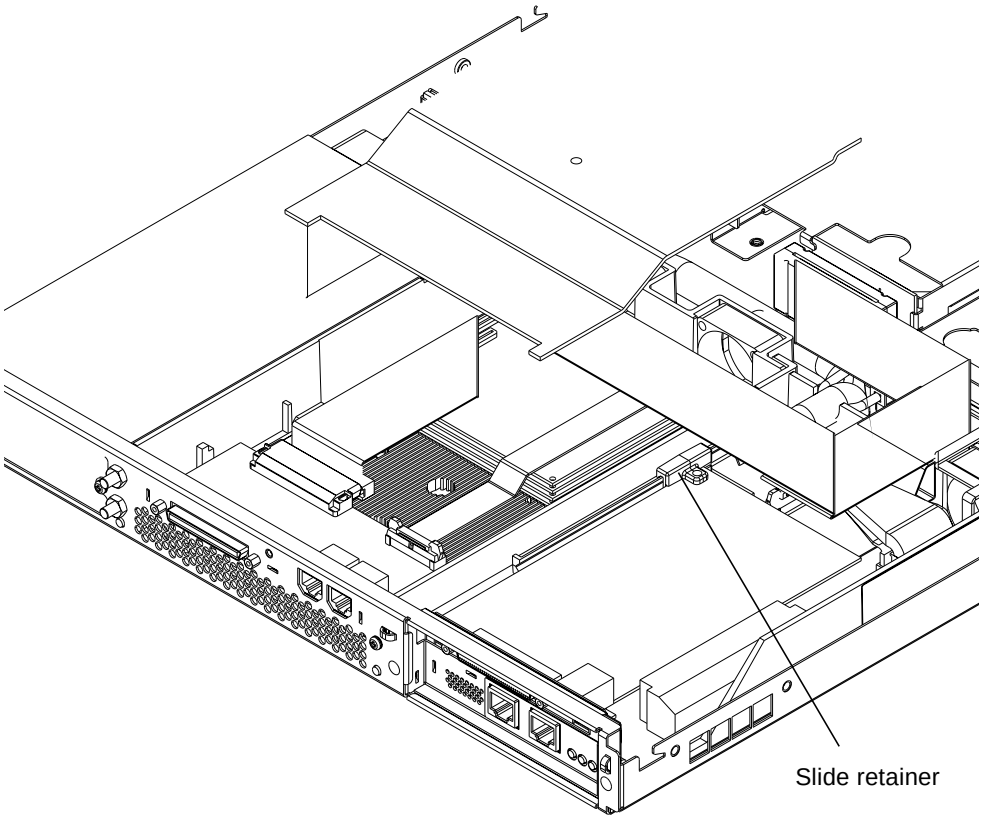

FIGURE B-7 Using the Slide Retainer to Hold the Corner of the PCI Card in Place

4. **Re-install the processor cover (see** FIGURE B-8**), ensuring that the corner tabs are put back underneath the rear I/O card.**

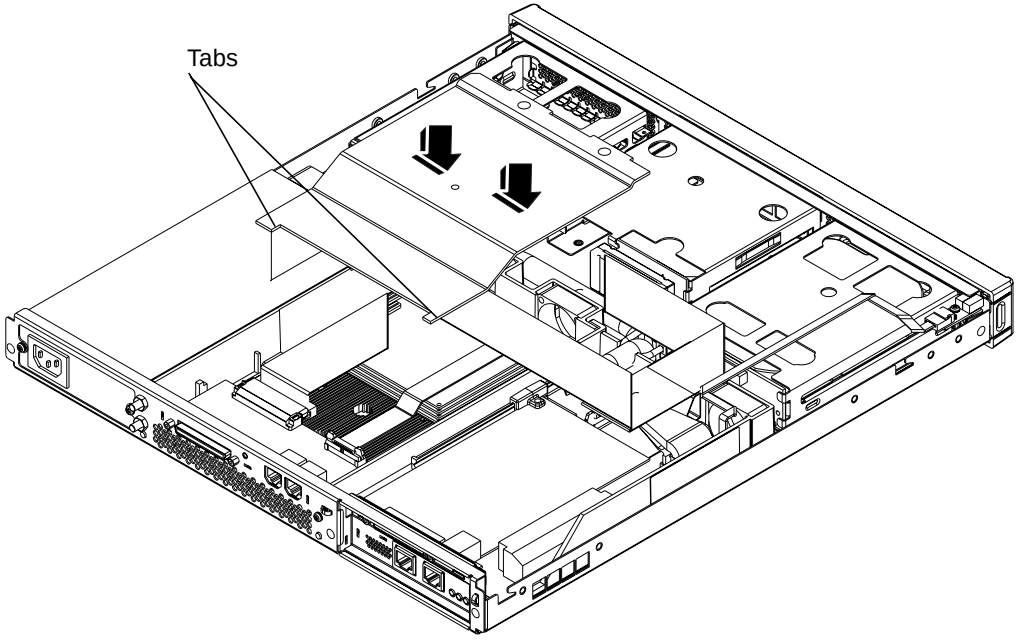

FIGURE B-8 Replacing the Processor Cover

5. **Make another visual inspection of the installation to check that the horizontal alignment of the PCI card has been maintained and that no cables have been trapped.**

6. **Re-install the lid and secure the screw at the rear of the unit (see** FIGURE B-9**).**

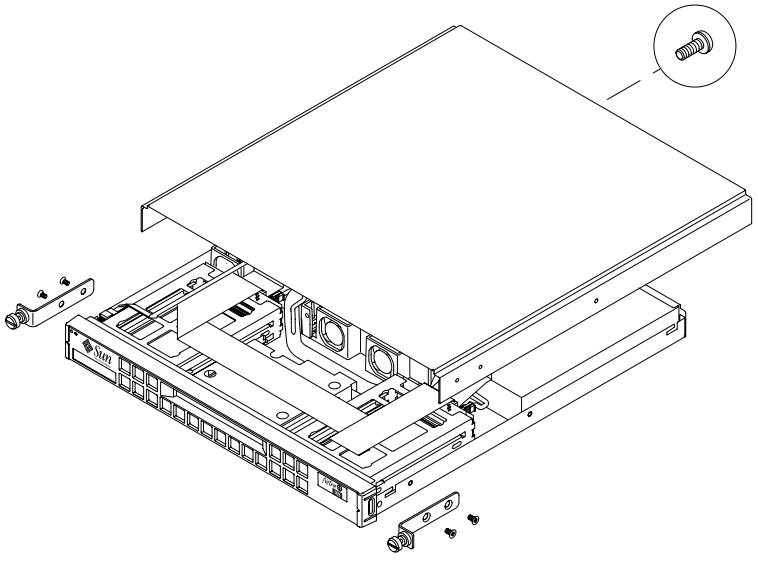

FIGURE B-9 Replacing the Lid

7. **Re-install the rack mount brackets if you removed them initially (see** FIGURE B-10**).**

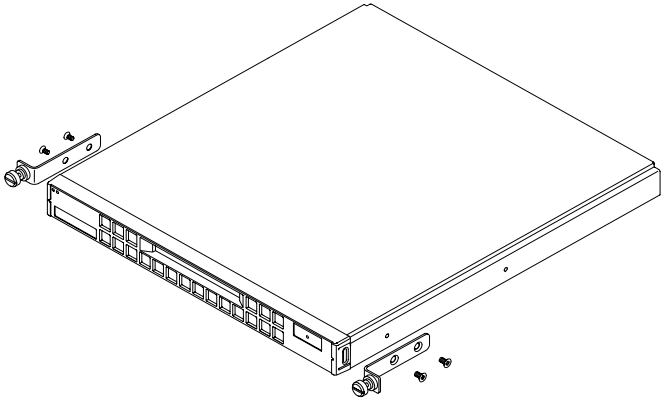

FIGURE B-10 Re-installing the Rack Mount Brackets

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