



Sun Fire™ V890 Server Service Manual

Sun Microsystems, Inc.
www.sun.com

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Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Industry Canada Equipment Standard for Digital Equipment (ICES-003) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan
- Bureau of Standards Metrology and Inspection (BSMI) — Taiwan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.



For important safety precautions to follow when installing or servicing this system, please see the “Safety Precautions” Appendix.

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables to comply with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

ICES-003 Class A Notice - Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ICES-003 Class B Notice - Avis NMB-003, Classe B

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.


VCCI 基準について

クラス A VCCI 基準について

クラス A VCCI の表示があるワークステーションおよびオプション製品は、クラス A 情報技術装置です。これらの製品には、下記の項目が該当します。

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クラス B VCCI 基準について

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BSMI Class A Notice

The following statement is applicable to products shipped to Taiwan and marked as Class A on the product compliance label.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Declaration of Conformity

Compliance Model Number: 890
Product Family Name: Sun Fire V890

EMC

European Union

This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

As Telecommunication Network Equipment (TNE) in both Telecom Centers and Other Than Telecom Centers per (as applicable):

EN300-386 V.1.3.1 (09-2001) Required Limits:

| | |
|-----------------|---|
| EN55022/CISPR22 | Class A |
| EN61000-3-2 | Pass |
| EN61000-3-3 | Pass |
| EN61000-4-2 | 6 kV (Direct), 8 kV (Air) |
| EN61000-4-3 | 3 V/m 80-1000MHz, 10 V/m 800-960 MHz and 1400-2000 MHz |
| EN61000-4-4 | 1 kV AC and DC Power Lines, 0.5 kV Signal Lines, |
| EN61000-4-5 | 2 kV AC Line-Gnd, 1 kV AC Line-Line and Outdoor Signal Lines, 0.5 kV Indoor Signal Lines > 10m. |
| EN61000-4-6 | 3 V |
| EN61000-4-11 | Pass |

As Information Technology Equipment (ITE) Class A per (as applicable):

EN55022:1998/CISPR22:1997 Class A

EN55024:1998 Required Limits:

| | |
|--------------|---|
| EN61000-4-2 | 4 kV (Direct), 8 kV (Air) |
| EN61000-4-3 | 3 V/m |
| EN61000-4-4 | 1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines |
| EN61000-4-5 | 1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines |
| EN61000-4-6 | 3 V |
| EN61000-4-8 | 1 A/m |
| EN61000-4-11 | Pass |

EN61000-3-2:1995 + A1, A2, A14 Pass

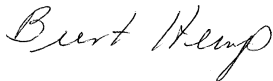
EN61000-3-3:1995 Pass

Safety: This equipment complies with the following requirements of the Low Voltage Directive 73/23/EEC:

EC Type Examination Certificates:

| | |
|---|--|
| EN 60950-1:2001 | TÜV Rheinland Certificate No. <i>-on file-</i> |
| IEC 60950-1:2001 | CB Scheme Certificate No. <i>-on file-</i> |
| Evaluated to all CB Countries | |
| UL 60950-1, First Edition; CSA C22.2 No. 60950-00 | File: E113363 |
| FDA DHHS Accession Number (Monitor Only) | |

Supplementary Information: This product was tested and complies with all the requirements for the CE Mark.



Burt Hemp
Manager, Product Compliance

May 5, 2004

Sun Microsystems, Inc.
One Network Circle, UBUR03-213
Burlington, MA 01803
USA

Tel: 781-442-2118
Fax: 781-442-1673

/S/

Donald Cameron
Program Manager

May 5, 2004

Sun Microsystems Scotland, Limited
Blackness Road, Phase I, Main Bldg
Springfield, EH49 7LR
Scotland, United Kingdom

Tel: +44 1 506 672 539
Fax: +44 1 506 670 011

Preface

The *Sun Fire V890 Server Service Manual* provides detailed procedures that describe the removal, installation, and replacement of serviceable parts and options in the Sun Fire™ V890 server. This service manual also includes information about diagnostics and maintenance of the system. This book is written for technicians, system administrators, qualified Sun service providers, and advanced computer system end users who have experience troubleshooting and replacing server hardware.

This manual presents information in a modular format designed to answer the type of questions that you might ask while servicing the Sun Fire V890 server. Typically, the modules cover specific tasks for a service-related procedure for a specific component.

Service providers who would like more general information about the system should refer to the appropriate chapter or section in the *Sun Fire V890 Server Owner's Guide*.

How This Book Is Organized

The chapters in this manual contain a series of related service tasks. Using the table of contents or the task list on the first page of each chapter, you can quickly find the procedure you need to perform a specific task. The procedures for the tasks are brief; however, they are interrelated and often refer to other modules in the book. For instance, the procedure “How to Remove the Motherboard” is related to many tasks covered by other modules. You must perform these requisite tasks before or after replacing the motherboard.

This book is divided into seven chapters and six appendixes.

- Chapter 1 describes the tasks that you need to perform before or after each service procedure.
- Chapter 2 explains tasks related to components on the motherboard side of the system.
- Chapter 3 describes tasks related to components on the input/output (I/O) board side of the system.
- Chapter 5 provides information about tasks related to various subassemblies in the system.
- Chapter 4 explains tasks related to storage devices.
- Chapter 6 describes tasks related to system backplanes and cables.
- Chapter 7 provides configuration information for various parts of the system.
- The appendixes provide information about field-replaceable units (FRUs), system LEDs, split backplane configurations, connector pinouts, system specifications, and safety precautions.

Using UNIX Commands

This document may 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:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at

<http://docs.sun.com>

Shell Prompts

| Shell | Prompt |
|---------------------------------------|----------------------|
| C shell | <i>machine-name%</i> |
| C shell superuser | <i>machine-name#</i> |
| Bourne shell and Korn shell | \$ |
| Bourne shell and Korn shell superuser | # |

Typographic Conventions

| Typeface ¹ | Meaning | Examples |
|-----------------------|--|--|
| AaBbCc123 | The names of commands, files, and directories; on-screen computer output | Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>% You have mail.</code> |
| AaBbCc123 | What you type, when contrasted with on-screen computer output | <code>% su</code> <code>Password:</code> |
| <i>AaBbCc123</i> | Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values. | Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this. To delete a file, type <code>rm filename</code> . |

¹ The settings on your browser might differ from these settings.

Related Documentation

| Application | Title |
|--|--|
| Installation | <i>Sun Fire V890 Server Rackmounting Guide</i> |
| | <i>Installation Instructions for Solaris</i> |
| | <i>Solaris (SPARC Platform Edition) Installation Guide</i> |
| | <i>Solaris (SPARC Platform Edition) Installation Release Notes</i> |
| | <i>Solaris Sun Hardware Platform Guide</i> |
| | <i>Solaris Installation Guide</i> |
| | <i>Solaris Advanced Installation Guide</i> |
| Owner's Guide | <i>Sun Fire V890 Server Owner's Guide</i> |
| Late-Breaking Information | <i>Sun Fire V890 Server Product Notes</i> |
| | <i>Solaris Release Notes</i> |
| | <i>Solaris Release Notes Supplement for Sun Hardware</i> |
| System Diagnostics | <i>SunVTS User's Guide</i> |
| | <i>SunVTS Test Reference Manual</i> |
| | <i>SunVTS Quick Reference Card</i> |
| System Management | <i>Sun Management Center Software Installation Guide</i> |
| | <i>Sun Management Center Software User's Guide</i> |
| | <i>Sun Management Center Software Release Notes</i> |
| | <i>Sun Management Center Supplement for Workgroup Servers</i> |
| System Administration | <i>Solaris System Administrator Documentation</i> |
| | <i>Platform Notes: The eri FastEthernet Device Driver</i> |
| | <i>Platform Notes: The Sun GigabitEthernet Device Driver</i> |
| | <i>Platform Notes: Using luxadm Software</i> |
| | <i>Sun Fire V890 Dynamic Reconfiguration User's Guide</i> |
| | <i>OpenBoot 4.x Command Reference Manual</i> |
| | <i>OpenBoot 4.x Quick Reference</i> |
| <i>OpenBoot PROM Enhancements for Diagnostic Operation</i> | |
| Remote System Monitoring and Control | <i>Sun Remote System Control (RSC) 2.2 User's Guide</i> |

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Please include the title and part number of your document with your feedback:

Sun Fire V890 Server Service Manual, part number 817-3957-11

Preparing to Service the System

This chapter tells you what you need to know about preparing for and completing service procedures.

Note – Except for removing and installing power supplies and disk drives, this system must be serviced only by qualified service personnel.

Please be sure to keep the following guidelines in mind:

- Internal disk drives and certain qualified PCI cards are hot-pluggable. For more information about hot-plugging, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.
- All redundant power supplies and fan trays are hot-swappable. You can remove and replace a power supply or faulty fan tray without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.
- For the servicing of any other parts internal to the system, you must first power off the system. See “How to Power Off the System” on page 5.

The following tasks are covered in this chapter:

- “How to Power On the System” on page 2
- “How to Power Off the System” on page 5
- “How to Initiate a Reconfiguration Boot” on page 10
- “How to Attach an Alphanumeric Terminal” on page 17
- “How to Configure a Local Graphics Console” on page 19
- “How to Open and Remove a Side Door” on page 21
- “How to Close a Side Door” on page 23
- “How to Avoid Electrostatic Discharge” on page 26

The following information is also included:

- “About Hot-Pluggable and Hot-Swappable Components” on page 6
- “About Power Button and Keyswitch Settings” on page 14
- “About Setting Up a Console” on page 16
- “Locating Rear Panel Features” on page 25
- “Tools Required for Installation and Service” on page 28

How to Power On the System

Before You Begin

Do not use this power-on procedure if the operating system is already installed and you have just added a new internal option or external storage device. To power on the system after adding one of these options, see:

- “How to Initiate a Reconfiguration Boot” on page 10

What to Do



Caution – Never move the system when the system power is on. Movement can cause catastrophic disk drive failure. Always power off the system before moving it.



Caution – Before you power on the system, make sure that the front and side doors and all plastic outer panels are properly installed.

1. Turn on power to any peripherals and external storage devices.
2. Turn on power to the alphanumeric terminal or local graphics console, if present.

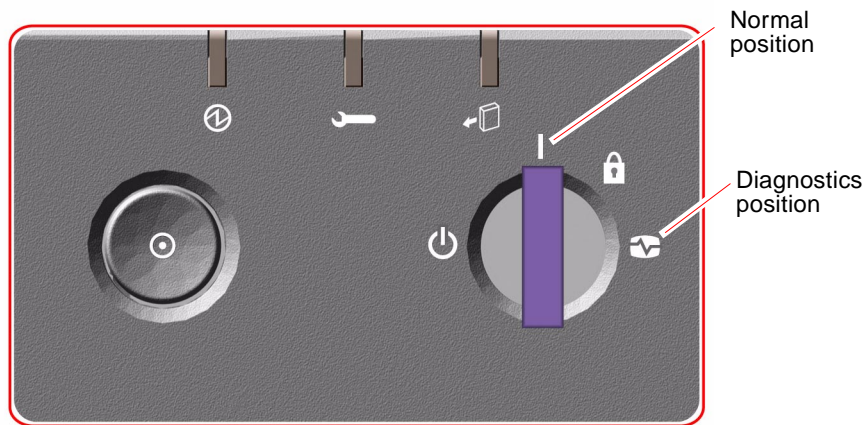
3. Insert the system key into the front panel keyswitch and turn it to the Normal or Diagnostics position.

Normal position will enable the custom OpenBoot™ configuration for diagnostic testing as defined for your system.

Diagnostics position will enable the standard default OpenBoot configuration for running diagnostic tests. Your system will automatically run maximum POST and OpenBoot Diagnostics tests and display the output. The system will also enable automatic system recovery (ASR).

For information about the standard default Open Boot configuration for diagnostic testing, see the *OpenBoot PROM Enhancements for Diagnostic Operations* Guide, which is included on the Sun Fire V890 Documentation CD.

See “About Power Button and Keyswitch Settings” on page 14 for information about each keyswitch setting.

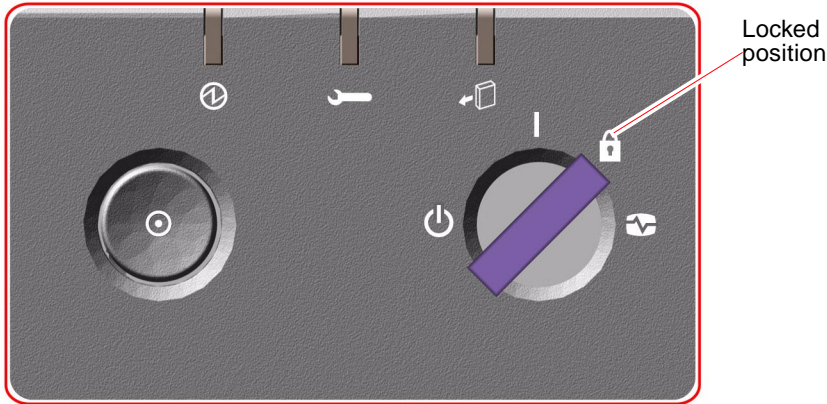


4. Press the Power button to the left of the keyswitch to power on the system.

Note – The system may take up to 30 minutes to run diagnostic tests and display status messages before the ok prompt appears on the system console. The time depends on the system configuration (number of CPUs, memory modules, and PCI cards) and the configuration of the OpenBoot variables, which by default are set at `diag-level=max` and `verbosity=normal`. To estimate boot time, and to customize the standard configuration after initial power-on, see the *OpenBoot PROM Enhancements for Diagnostic Operation* guide, which is included on the Sun Fire V890 Documentation CD.

5. Turn the keyswitch to the Locked position.

This prevents anyone from accidentally powering off the system.



6. Remove the key from the keyswitch and keep it in a secure place.

What Next

The system's front panel LED indicators provide power-on status information. For more information about the system LEDs, see "About Front Panel LEDs" on page 261.

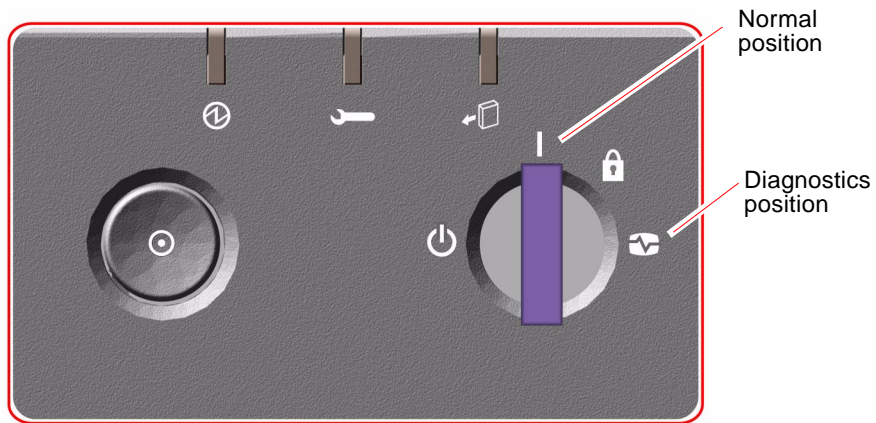
If your system encounters a problem during system startup, and the keyswitch is in the Normal position, try restarting the system in the Service mode to determine the source of the problem. Turn the front panel keyswitch to the Diagnostics position and power cycle the system. See:

- "How to Power Off the System" on page 5
- "How to Power On the System" on page 2

How to Power Off the System

What to Do

1. Notify users that the system will be powered down.
2. Back up the system files and data, if necessary.
3. Ensure that the front panel keyswitch is in the Normal or Diagnostics position.

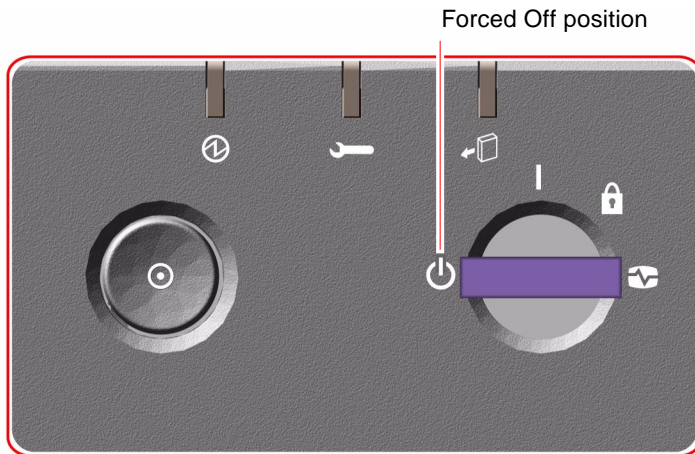


4. Press and release the Power button on the system front panel.
The system begins a graceful software system shutdown.

Note – Pressing and releasing the Power button initiates a graceful software system shutdown. Pressing and holding in the Power button for five seconds causes an immediate hardware shutdown. Whenever possible, you should use the graceful shutdown method. Forcing an immediate hardware shutdown may cause disk drive corruption and loss of data. Use this method only as a last resort.

5. Wait for the front panel Power/OK LED to turn off.

6. Turn the keyswitch to the Forced Off position.



Caution – Be sure to turn the keyswitch to the Forced Off position before handling any internal components. Otherwise, it is possible for a Remote System Control (RSC) user to restart the system remotely while you are working inside it. The Forced Off position is the only keyswitch position that prevents an RSC user from restarting the system.

7. Remove the key from the keyswitch and keep it in a secure place.

About Hot-Pluggable and Hot-Swappable Components

Sun Fire V890 systems feature a variety of components that can be serviced while the machine is running.

Hot-pluggable components are components that a qualified service technician can install or remove while the system is running, without affecting the rest of the system's capabilities. However, in many cases, you must prepare the operating system prior to the hot-plug event by performing certain system administration tasks.

Components that can be serviced without such preparation are called *hot-swappable* components. These components can be removed or inserted at any time without preparing the operating system in advance.

Sun Fire V890 hot-pluggable components fall into three basic groups:

- Fan trays and power supplies
- Disk drives
- PCI cards

Each group is discussed in more detail in the sections that follow.

Note – PCI and disk hot-plug operations are not supported when the system `ok` prompt is displayed. You can only perform these hot-plug operations while the operating system is running.



Caution – The system controller (SC) card cannot be serviced while the system is running. Before installing or removing a system controller card, you must power off the system and disconnect all AC power cords.

Fan Trays and Power Supplies

Sun Fire V890 fan trays and power supplies are hot-swappable—they can be removed or inserted at any time without requiring prior software preparations. Keep in mind that a power supply is not considered hot-swappable unless it is part of an N+1 redundant power configuration—a system configured with the third power supply. Do not remove a power supply from a working system if its removal would leave the system with fewer than two working power supplies.

You can install or remove a power supply or fan tray while the system is operating at the `ok` prompt. However, in the case of the power supply, you must issue a `reset-all` command at the `ok` prompt in order for the change to be recognized the next time the operating system is booted.

Note – If you remove a power supply or fan tray while the operating system is running, wait for an acknowledgement message on the system console before installing a replacement part; otherwise, the environmental monitoring software will not recognize the new device and false error conditions will result.



Caution – When hot-swapping a redundant fan tray, do not put your hand into the empty fan tray bay. The fans in the populated bay are still spinning.

For additional information, see:

- “About Power Supplies” on page 232
- “About Fan Trays” on page 235

Disk Drives

Sun Fire V890 internal disk drives are hot-pluggable. However, certain software preparations are required. To perform Sun Fire V890 disk drive hot-plug operations, you use the Solaris `luxadm` utility. The `luxadm` utility is a command-line tool for managing intelligent storage arrays such as Sun StorEdge™ A5x00 series disk arrays or Sun Fire V890 internal storage arrays.

For more information about `luxadm`, see the *Sun Fire V890 Server Owner's Guide*. For complete disk hot-plug procedures, refer to *Platform Notes: Using luxadm Software*, which is available on the Sun Fire V890 Documentation CD. Refer also to the *Sun Fire V890 Server Product Notes* for late-breaking details.



Caution – When hot-plugging a disk drive, after disconnecting the drive from its backplane, allow 30 seconds or so for the drive to spin down completely before removing it from its drive bay.

PCI Cards

On Sun Fire V890 systems, PCI cards are hot-pluggable, while the system controller card cannot be serviced when the machine is running.

Hot-plug operations for PCI cards involve Dynamic Reconfiguration (DR). DR is an operating system feature that provides the ability to reconfigure system hardware while the system is running. DR lets you logically attach or detach hardware resources within an active operating system. The main benefit of DR is that a service provider can add or replace hardware resources with little or no impact on normal system operations.

PCI card hot-plug procedures may involve software commands for preparing the system prior to removing a device, and for reconfiguring the operating system after installing a new device. In addition, certain system requirements must be met in order for hot-plug operations to succeed.

For information about system requirements and limitations, and for detailed PCI card hot-plug procedures, refer to the *Sun Fire V890 Dynamic Reconfiguration User's Guide*, which is available at <http://docs.sun.com>, under Solaris on Sun Hardware. Refer to the *Sun Fire V890 Server Product Notes* for late-breaking details.



Caution – You can hot-plug any standard PCI card that complies with PCI Hot-Plug Specification Revision 1.1, provided a suitable software driver exists for the Solaris Operating System, and the driver supports hot-plugging as described in the *Sun Fire V890 Dynamic Reconfiguration User's Guide*. The Sun Fire V890 system must be running the Solaris 8 7/01 Operating System or a subsequent release that supports Sun Fire V890 PCI hot-plug operations. Do not attempt to hot-plug a PCI card until you are certain that its device drivers provide the proper support; otherwise, you may cause a system panic. For a list of Sun PCI cards and device drivers that support PCI hot-plug operations, see the *Sun Fire V890 Server Product Notes*.

Note – DR works in conjunction with (but does not require) multipathing software. You can use multipathing software to switch I/O operations from one I/O controller to another to prepare for DR operations. With a combination of DR and multipathing software, you can remove, replace, or deactivate a PCI controller card with little or no interruption to system operation. Note that this requires redundant hardware; that is, the system must contain an alternate I/O controller that is connected to the same device(s) as the card being removed or replaced. The alternate controller must reside on a different PCI card or be integrated into the Sun Fire V890 system motherboard or I/O board. For additional details, see the *Sun Fire V890 Server Owner's Guide*.

PCI Hot-Plug User Interfaces

There are two different methods for performing PCI hot-plug operations on Sun Fire V890 systems:

- Push-button method
- Command-line method

The push-button method relies on push buttons and status LEDs located near each PCI slot. You can initiate a hot-plug operation by pressing the push button for the corresponding slot. The command-line method lets you perform hot-plug operations via a remote login session, a Remote System Control (RSC) console, or a locally attached console. This method involves the Solaris `cfgadm(1)` command.

Both hot-plug methods make use of the status LEDs located near each PCI slot. These LEDs indicate where and when it is safe to insert or remove a card, and also show whether the operation has succeeded or failed. For additional details on hot-plug status LEDs, see “About PCI Slot LEDs” on page 265.

Note – Regardless of the method you use, it is often necessary to perform additional administrative steps to prepare for a hot-plug removal operation. Prior to performing a removal operation, you must ensure that the devices residing on the board are not currently in use. To identify and manually terminate usage of such devices, you can use standard Solaris Operating System commands such as `mount(1M)`, `umount(1M)`, `swap(1M)`, `ifconfig(1M)`, and `ps(1)`.

For detailed PCI hot-plug procedures, refer to the *Sun Fire V890 Dynamic Reconfiguration User's Guide*, which is available at <http://docs.sun.com>, under Solaris on Sun Hardware. Refer to the *Sun Fire V890 Server Product Notes* for late-breaking details.

How to Initiate a Reconfiguration Boot

After installing any new internal option or external storage device, you must perform a reconfiguration boot so that the operating system is able to recognize the newly installed device(s). In addition, if you remove any device and do not install a replacement device prior to rebooting the system, you must perform a reconfiguration boot in order for the operating system to recognize the configuration change. This requirement also applies to any component that is connected to the system's I²C bus, including memory modules, CPU/Memory boards, and power supplies.

This requirement *does not* apply to any component that is:

- Installed or removed as part of a hot-plug operation
- Installed or removed before the operating system is installed
- Installed as an identical replacement for a component that is already recognized by the operating system



Caution – All internal options (except disk drives and power supplies) must be installed only by qualified service personnel.

Before You Begin



Caution – Before you power on the system, make sure that the front and side doors and all plastic outer panels are properly installed.

You need a system console in order to issue software commands. See:

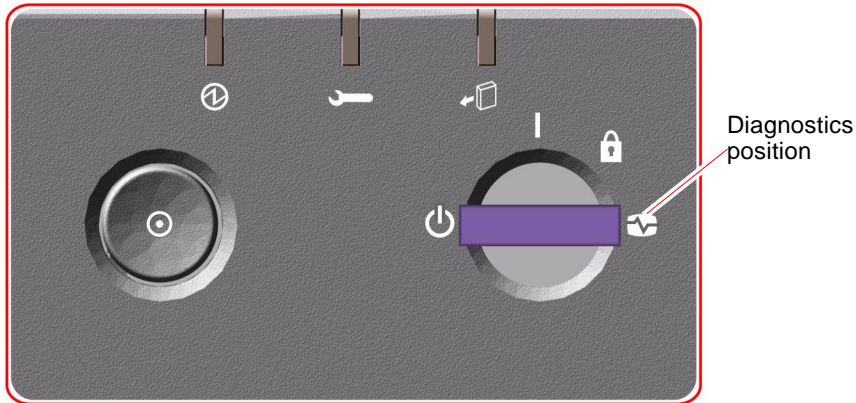
- “About Setting Up a Console” on page 16.

What to Do

1. **Turn on power to any peripherals and external storage devices.**
Read the documentation supplied with the device for specific instructions.
2. **Turn on power to the console.**
3. **Insert the system key into the front panel keyswitch and turn the keyswitch to the Diagnostics position.**

4. Press the Power button to the left of the keyswitch to power on the system.

The system will automatically run power-on self-test (POST) and OpenBoot Diagnostics tests and display the output.



5. When the diagnostics tests are completed, and the system banner is displayed on the system console, immediately abort the boot process to access the system ok prompt.

The system banner contains the Ethernet address and host ID.

Note – The system may take up to 30 minutes to run diagnostic tests and display status messages before the ok prompt appears on the system console. The time depends on the system configuration (number of CPUs, memory modules, and PCI cards) and the standard default configuration of the OpenBoot variables, which by default are set at `diag-level=max` and `verbosity=normal`. To customize the standard configuration after initial power-on, see the *OpenBoot PROM Enhancements for Diagnostic Operation* guide, which is included on the Sun Fire V890 Documentation CD.

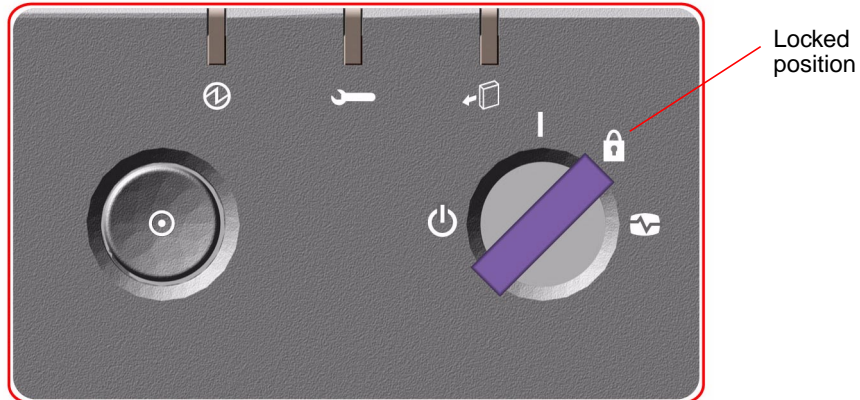
6. At the `ok` prompt, type:

```
ok env-on  
Environmental monitor is ON  
ok boot -r
```

The `env-on` command re-enables the OpenBoot environmental monitor, which may have been disabled as a result of the abort key sequence. The `boot -r` command rebuilds the device tree for the system, incorporating any newly installed options so that the operating system will recognize them.

7. Turn the keyswitch to the Locked position, remove the key, and keep it in a secure place.

This prevents anyone from accidentally powering off the system.



What Next

The system's front panel LED indicators provide power-on status information. For more information about the system LEDs, see "About Front Panel LEDs" on page 261.

If your system encounters a problem during system start-up, and the keyswitch is in the Normal position, try restarting the system with the keyswitch in the Diagnostics position to determine the source of the problem. Turn the front panel keyswitch to the Diagnostics position and power cycle the system.

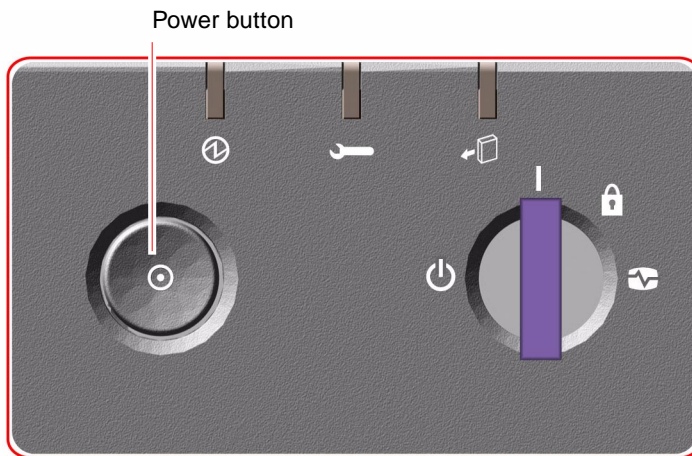
About Power Button and Keyswitch Settings

System Power Button

The system Power button is recessed to prevent accidentally turning the system on or off. The ability of the Power button to turn the system on or off is controlled by the security keyswitch.





If the operating system is running, pressing and releasing the Power button initiates a graceful software system shutdown. Pressing and holding in the Power button for five seconds causes an immediate hardware shutdown.

Note – Whenever possible, you should use the graceful shutdown method. Forcing an immediate hardware shutdown may cause disk drive corruption and loss of data. Use this method only as a last resort.



Security Keyswitch

The four-position security keyswitch controls the power-on modes of the system and prevents unauthorized users from powering off the system or reprogramming system firmware. The following table describes the function of each keyswitch setting.

| Position | Icon | Description |
|-------------|---|--|
| Normal |  | This setting enables the system Power button to power the system on or off. If the operating system is running, pressing and releasing the Power button initiates a graceful software system shutdown. Pressing and holding the Power button in for five seconds causes an immediate hardware power off. |
| Locked |  | <p>The Locked setting:</p> <ul style="list-style-type: none">• Disables the system Power button to prevent unauthorized users from powering the system on or off• Disables the keyboard Stop-A command, terminal Break key command, ~# tip window command, and RSC break command, preventing users from suspending system operation to access the system ok prompt• Prevents unauthorized programming of the system flash PROMs <p>The Locked position is the recommended setting for normal day-to-day operations.</p> |
| Diagnostics |  | This setting forces the power-on self-test (POST) and OpenBoot Diagnostics to run during system startup. The Power button functions the same as when the keyswitch is in the Normal position. |
| Forced Off |  | <p>This setting forces the system to power off immediately and enter 5-volt standby mode. It also disables the system Power button. You may want to use this setting when AC power is interrupted and you do not want the system to restart automatically when power is restored. With the keyswitch in any other position, if the system was running prior to losing power, it restarts automatically once power is restored.</p> <p>The Forced Off setting also prevents an RSC console from restarting the system. However, the service controller card continues to operate using the system's 5-volt standby power.</p> |

About Setting Up a Console

To install your server or to diagnose problems, you need some way to enter system commands and to view system output. There are four ways to do this.

1. Attach an alphanumeric (ACSII) character terminal to serial port A.

You can attach a simple terminal to serial port A. For instructions, see “How to Initiate a Reconfiguration Boot” on page 10.

2. Establish a `tip` connection from another Sun system.

For information about establishing a `tip` connection, see the *OpenBoot 4.x Command Reference Manual*, which is available at <http://docs.sun.com>, under Solaris on Sun Hardware. Refer to the *Sun Fire V890 Server Product Notes* for late-breaking details.

3. Install a local graphics console on your server.

The server is often shipped without a mouse, keyboard, monitor, or frame buffer for the display of graphics. To install a local graphics console on a server, you must install a graphics frame buffer card in a PCI slot, and attach a monitor, mouse, and keyboard to the appropriate rear panel ports. For detailed instructions, see “How to Configure a Local Graphics Console” on page 19.

Note – Power-on self-test (POST) messages are output to serial port A (`ttya`) or the RSC console only.

4. Set up a Remote System Control (RSC) console.

RSC is a remote server management tool that lets you monitor and control your server over serial lines or over a network. RSC provides remote system administration for geographically distributed or physically inaccessible systems. For additional details, see your *Sun Fire V890 Server Owner's Guide*.

Note – You cannot use an RSC console to perform the initial installation of the Solaris OS. The operating system must be installed prior to setting up an RSC console. Once you install the operating system and the RSC software, you can configure the system to use RSC as the system console. For detailed instructions, see your *Sun Fire V890 Server Owner's Guide*.

How to Attach an Alphanumeric Terminal

Before You Begin

If your server is configured without a local graphics console, you need to attach an alphanumeric (ASCII) terminal to the server in order to install the operating system and to run diagnostic tests. Alternatively, you can install a local graphics console, create a `tip` connection from another Sun system, or set up an RSC console. See:

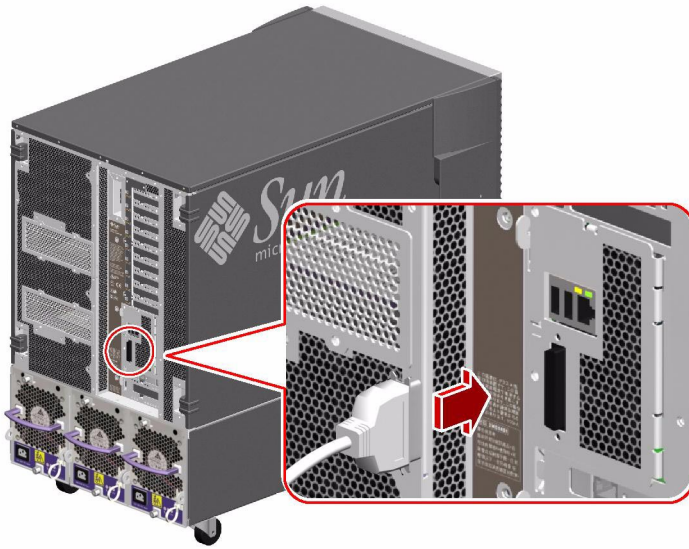
- “About Setting Up a Console” on page 16
- “How to Configure a Local Graphics Console” on page 19

Note – You cannot use an RSC console to perform the initial installation of the Solaris OS. The Solaris OS must be installed prior to setting up an RSC console.

What to Do

1. **Connect a DB-25 null modem serial cable or a DB-25 serial cable and null modem adapter to the terminal’s serial port.**

2. Connect the opposite end of the cable to the system's serial port connector or to serial port A on the serial splitter cable.



3. Connect the terminal's power cable to an AC outlet.
4. Set the terminal to receive:
 - At 9600 baud
 - An 8-bit signal with no parity and 1 stop bit

See the documentation accompanying your terminal for more information.

What Next

You can now issue system commands and view system messages. Continue with your installation or diagnostic procedure as needed.

How to Configure a Local Graphics Console

Before You Begin

If your server is configured without a local alphanumeric terminal, you need to install a local graphics console in order to install the operating system and to run diagnostic tests. Alternatively, you can attach an alphanumeric (ASCII) terminal, create a `tip` connection from another Sun system, or set up an RSC console. See:

- “About Setting Up a Console” on page 16
- “How to Attach an Alphanumeric Terminal” on page 17

Note – You cannot use an RSC console to perform the initial installation of the Solaris OS. The Solaris OS must be installed prior to setting up an RSC console.

To install a local graphics console, you must have:

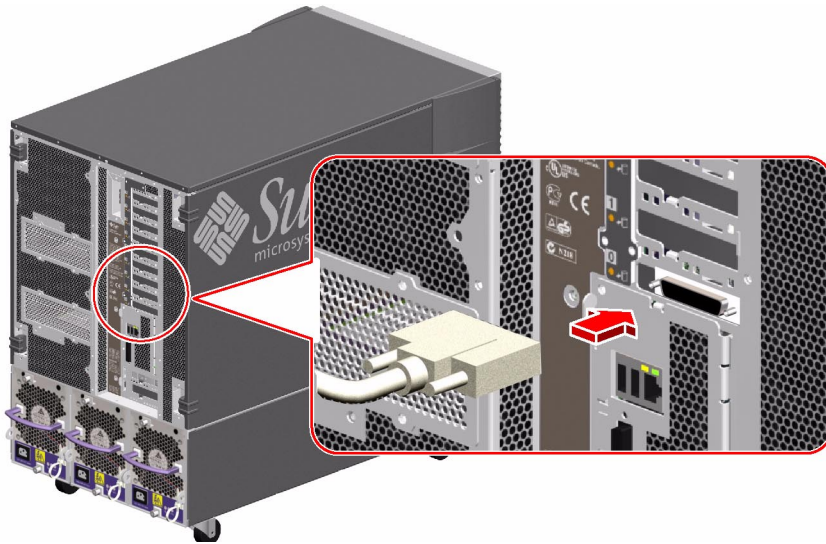
- A supported PCI-based graphics frame buffer card and software driver
- A monitor with appropriate resolution
- A Sun Type-6 USB keyboard
- A Sun-compatible USB three-button mouse

What to Do

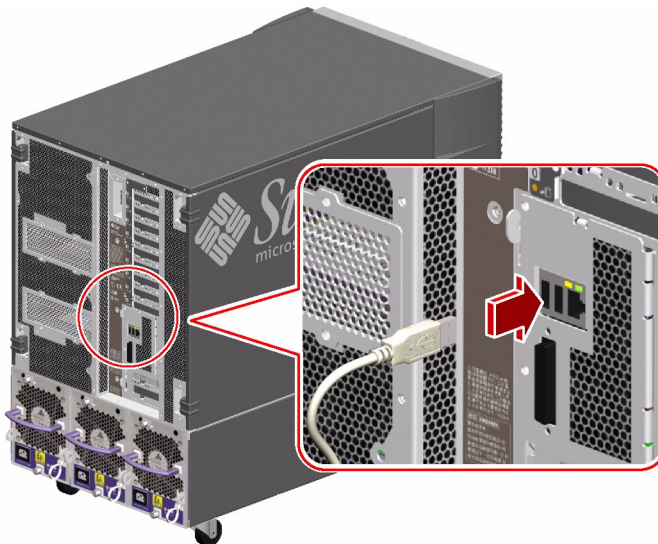
1. **Install the graphics card into a vacant PCI slot.**

See “How to Install a PCI Card” on page 83.

2. Attach the monitor video cable to the graphic card's video port.
Tighten the thumbscrews to secure the connection.



3. Connect the monitor's power cord to an appropriate AC power outlet.
4. Attach the keyboard cable to one of the system's USB ports.



5. Attach the mouse cable to the system's remaining USB port, or to a USB port on the keyboard, if applicable.

What Next

You can now issue system commands and view system messages. Continue with your service or diagnostic procedure as needed.

How to Open and Remove a Side Door

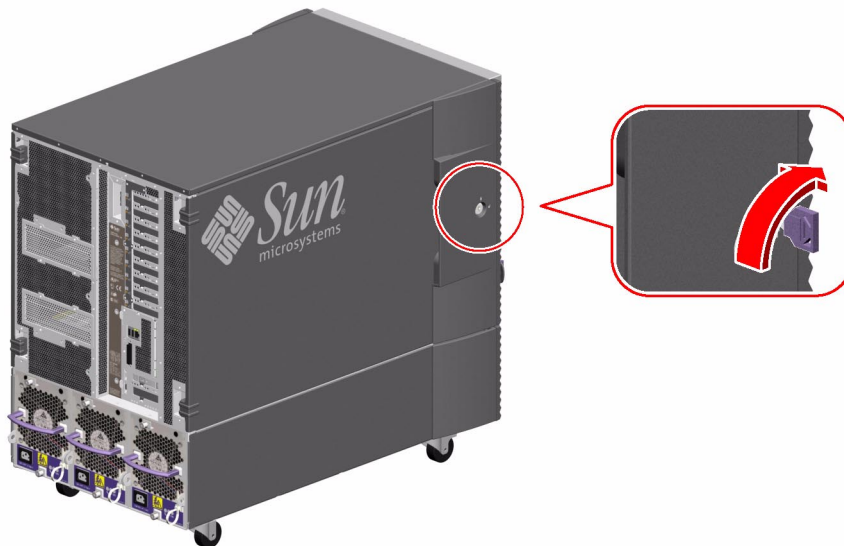
Before You Begin

If you are not performing a hot-plug procedure, complete the following task:

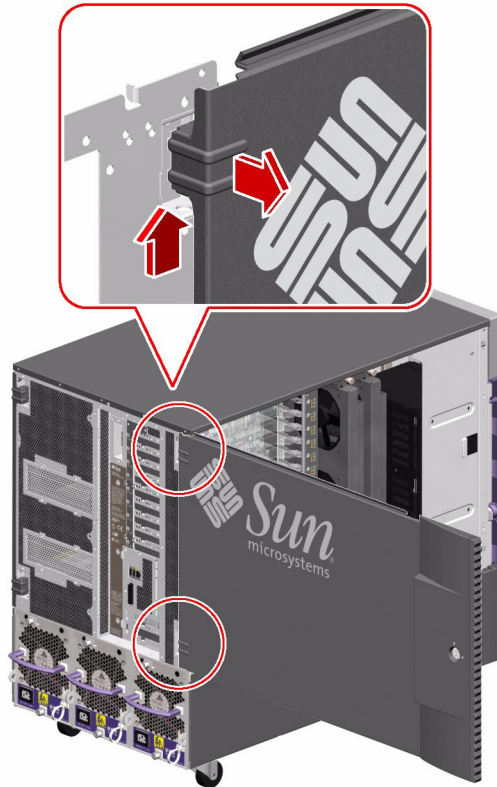
- “How to Power Off the System” on page 5

What to Do

1. Use the system key to unlock the door.



2. Swing the side door open.
3. To remove the door from the chassis, open the door 90 degrees and pull it up until its mounting pins clear the brackets on the rear panel.



What Next

To reassemble the system side door, complete the following task:

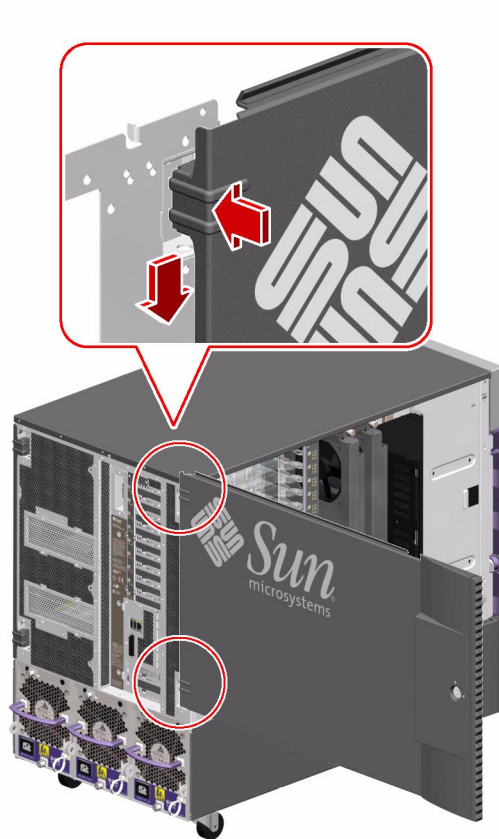
- “How to Close a Side Door” on page 23

How to Close a Side Door

What to Do

1. **If you removed the side door, remount it to the chassis.**

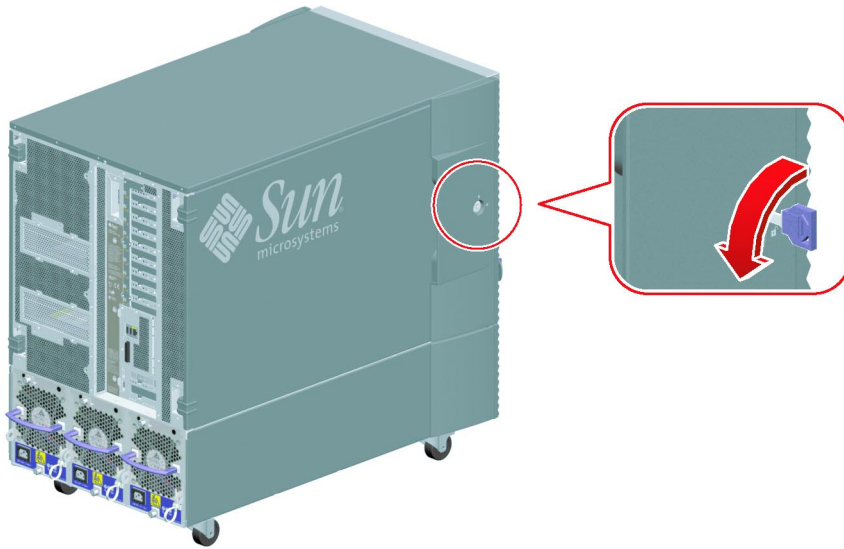
Position the side door mounting pins over the corresponding holes in the chassis rear panel and lower the side door into place.



2. **Close the side door.**

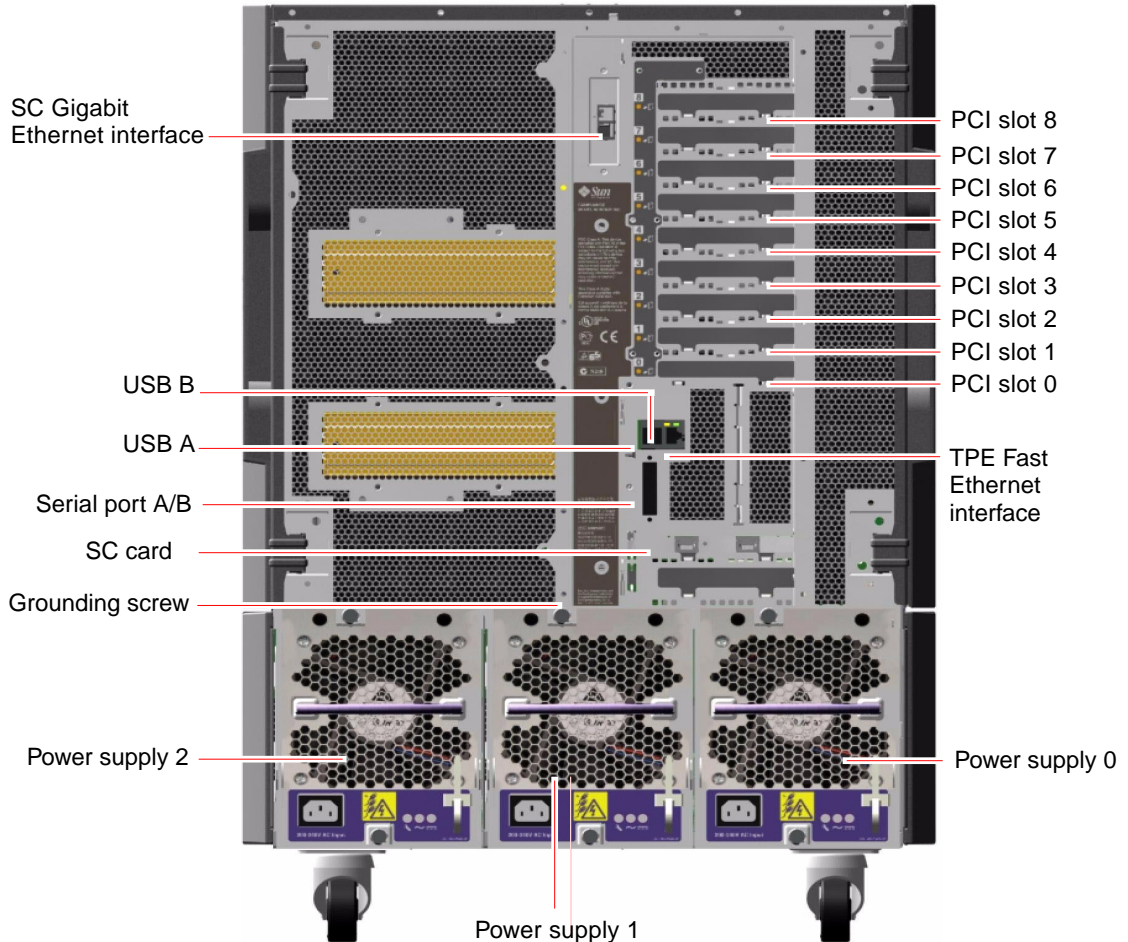
Make sure that the door is firmly seated in its frame.

3. Lock the side door with the system key.



Locating Rear Panel Features

The following figure shows the system features that are accessible from the rear panel.



A grounding screw is located just above the center power supply. When installing a Sun Fire V890 server into a rack, or connecting the server to an external storage array, be sure to connect an appropriate grounding strap between the server's grounding screw and the grounding screw on the rack enclosure or external storage array. A grounding strap prevents ground loops between systems and peripherals and helps guard against possible data loss.

How to Avoid Electrostatic Discharge

Use the following procedure to prevent static damage whenever you are accessing any of the internal components of the system.

Before You Begin

Complete this task if you are working with a component that is not hot-pluggable:

- “How to Power Off the System” on page 5

You must have the following items:

- Antistatic wrist or foot strap
- Antistatic mat (or the equivalent)

What to Do



Caution – Printed circuit boards and hard disk drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions.

1. **Disconnect the AC power cord from the wall power outlet only when performing the following procedures:**
 - Removing and installing the system controller card
 - Removing and installing the I/O board
 - Removing and installing the power distribution board

The AC power cord provides a discharge path for static electricity, so it should remain plugged in except when you are servicing the parts noted above.

2. Use an antistatic mat or similar surface.

When performing any option installation or service procedure, place static-sensitive parts, such as boards, cards, and disk drives, on an antistatic surface. The following items can be used as an antistatic surface:

- The bag used to wrap a Sun replacement part
- The shipping container used to package a Sun replacement part
- Sun electrostatic discharge (ESD) mat, Sun part number 250-1088 (available through your Sun sales representatives)
- Disposable ESD mat, shipped with replacement parts or options

3. Use an antistatic wrist strap.

Attach one end of the strap to the system chassis sheet metal, and attach the other end to your wrist. Refer to the instructions that come with the strap.

Note – Make sure that the wrist strap is in direct contact with the metal on the chassis.



4. Detach both ends of the strap after you complete the installation or service procedure.

Tools Required for Installation and Service

The following tools are required to install and service the system:

- Screwdriver, Phillips No. 1
- Screwdriver, Phillips No. 2
- Nut driver, 3/16ths inch
- Electrostatic discharge (ESD) mat, Sun part number 250-1088, or equivalent
- Grounding wrist or foot strap

The latter two items help protect the server against damage due to electrostatic discharge. For more information, see “How to Avoid Electrostatic Discharge” on page 26.

Servicing the Motherboard Side Components

This chapter describes how to remove and install the system motherboard and components on the motherboard side of the system. For a list of part numbers for field-replaceable units (FRUs) and optional equipment, see “Illustrated Parts Breakdown” on page 249.

The following tasks are covered in this chapter:

- “How to Remove a CPU/Memory Board” on page 30
- “How to Install a CPU/Memory Board” on page 34
- “How to Remove a Memory Module” on page 40
- “How to Install a Memory Module” on page 44
- “How to Remove a CPU Fan Tray” on page 48
- “How to Install a CPU Fan Tray” on page 50
- “How to Remove a Motherboard Fan Tray” on page 52
- “How to Install a Motherboard Fan Tray” on page 55
- “How to Remove the CPU Fan Status Assembly” on page 57
- “How to Install the CPU Fan Status Assembly” on page 60
- “How to Remove the CPU/Memory Board Status Assembly” on page 61
- “How to Install the CPU/Memory Board Status Assembly” on page 63
- “How to Remove the Motherboard Fan Status Flex Circuit” on page 64
- “How to Install the Motherboard Fan Status Flex Circuit” on page 65
- “How to Remove the Motherboard” on page 66
- “How to Install the Motherboard” on page 70

How to Remove a CPU/Memory Board

You must remove the CPU/Memory board to service the memory modules.



Caution – Either a CPU/Memory board or an air baffle must be installed in each CPU/Memory slot at all times. After removing a CPU/Memory board, you must install a replacement board or an air baffle immediately to avoid an automatic thermal shutdown. For more information, see “About CPU/Memory Boards” on page 218.

Note – Use only Sun Fire V890 CPU/Memory boards in the Sun Fire V890 system.

Before You Begin

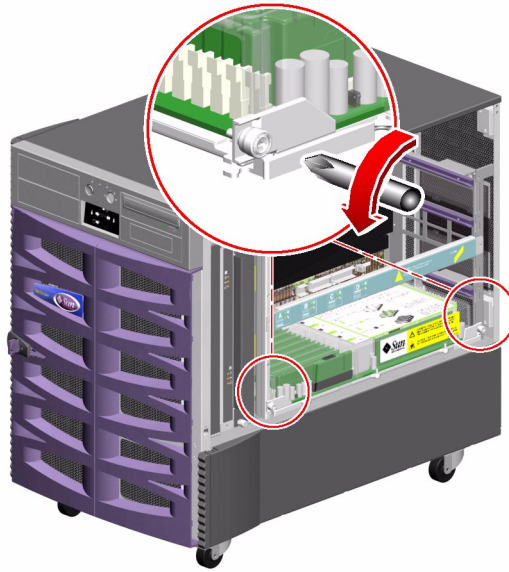
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

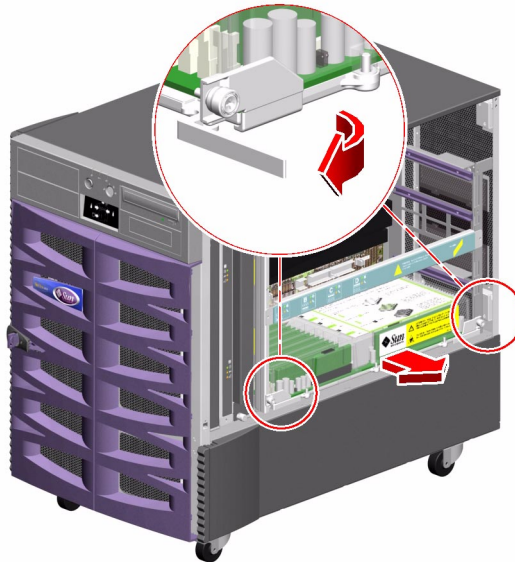
What to Do

1. Identify the CPU/Memory board that you want to remove.

2. Loosen the two captive screws securing the CPU/Memory board.



3. Rotate the green CPU/Memory board ejection levers outward so that the CPU/Memory board connectors disengage from the motherboard.

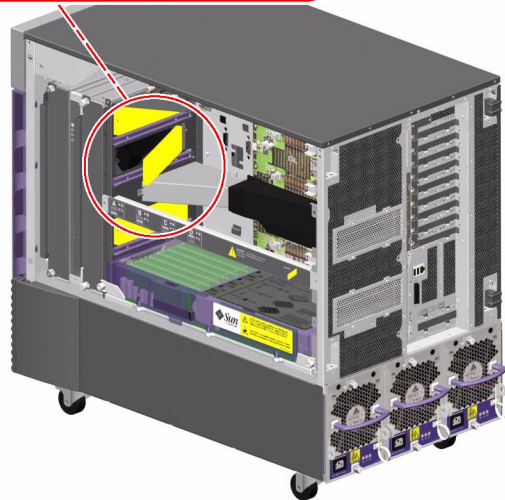
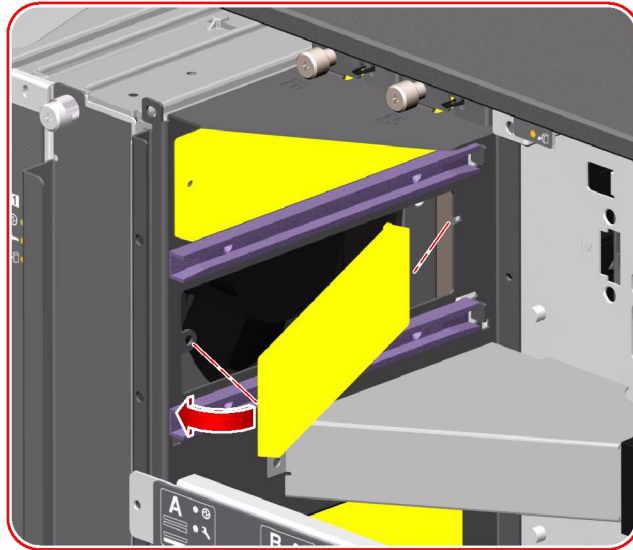


4. Pull the CPU/Memory board from the chassis.
5. Place the CPU/Memory board on an antistatic mat.
6. If you are not immediately replacing the CPU/Memory board, install a CPU air baffle into its slot next to the CPU fan trays.



Caution – A CPU air baffle must be installed into an empty CPU/Memory board slot to ensure proper cooling of the system. Spare CPU air baffles are located under the CPU side chassis top.

- a. Align the air baffle so that the tab on the end is under its slot in the chassis.
- b. Rotate the air baffle into position.
- c. Push in the plastic pin on the air baffle.



7. If you are not immediately replacing the CPU/Memory board, install a CPU/Memory board dust cover on that slot's motherboard CPU/Memory board connectors.

What Next

If you are installing a replacement CPU/Memory board, you must transfer all memory modules from the faulty board to the replacement board. Complete these tasks:

- “How to Remove a Memory Module” on page 40
- “How to Install a Memory Module” on page 44

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you are not replacing the part right away, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the configuration change. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Install a CPU/Memory Board

Before You Begin



Caution – If a CPU/Memory board connector dust cover is installed on the motherboard CPU/Memory board connectors in the slot you are installing the CPU/Memory board, you must remove it. If you have not removed the dust cover from the motherboard, installing a CPU/Memory board in that slot may damage the motherboard and the CPU/Memory board.

Note – Use only Sun Fire V890 CPU/Memory boards in the Sun Fire V890 system.

Complete the following tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

If you are replacing a faulty CPU/Memory board with a new one, you must transfer the memory modules from the faulty CPU/Memory board to the new one. See the following sections for more information about transferring memory modules:

- “About Memory Modules” on page 221
- “How to Remove a Memory Module” on page 40
- “How to Install a Memory Module” on page 44

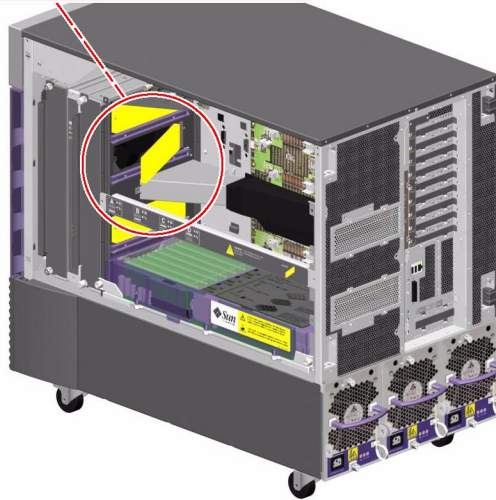
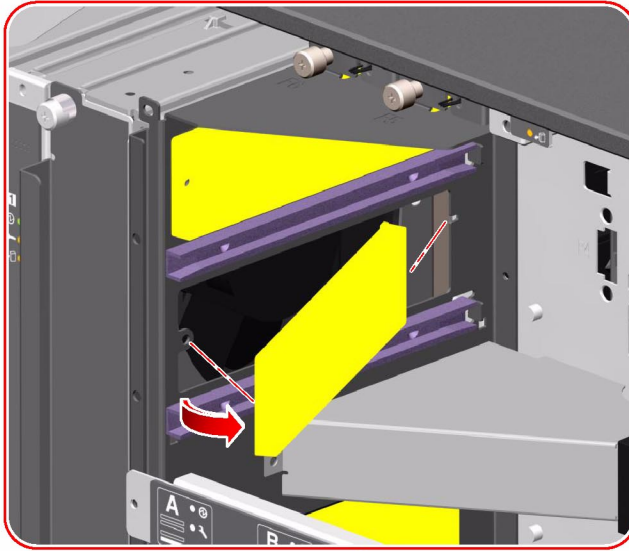
What to Do

1. **Locate the CPU/Memory board slot into which you want to install the CPU/Memory board.**
2. **If a CPU/Memory board connector dust cover is installed on the slot’s motherboard CPU/Memory board connectors, remove it.**



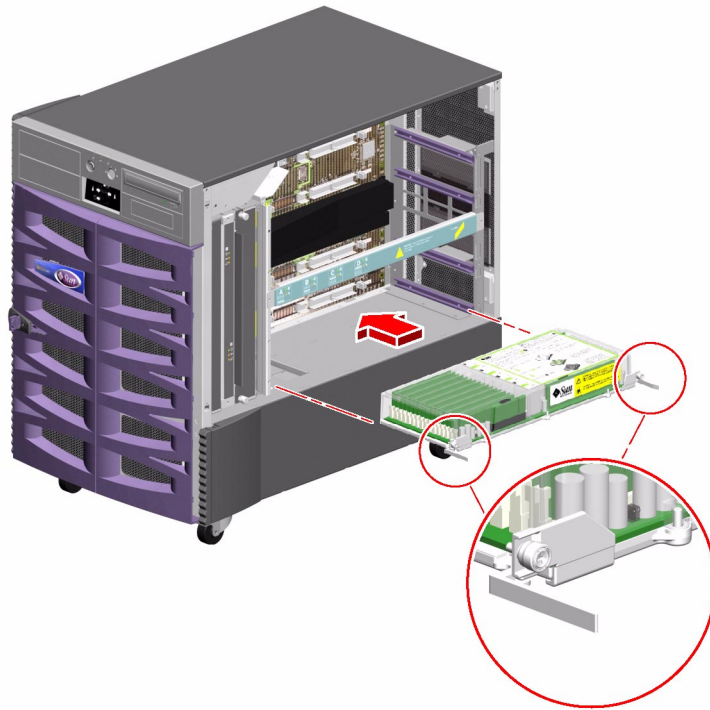
Caution – If you have not removed the dust cover from the motherboard CPU/Memory board connectors, installing a CPU/Memory board in that slot may damage the motherboard and the CPU/Memory board.

3. If a CPU air baffle is installed in the CPU/Memory board's slot, remove the air baffle.
 - a. Pull the plastic tab on the air baffle and rotate the baffle from its slot.



- b. Place the CPU air baffle into an empty CPU air baffle slot on the underside of the chassis top.

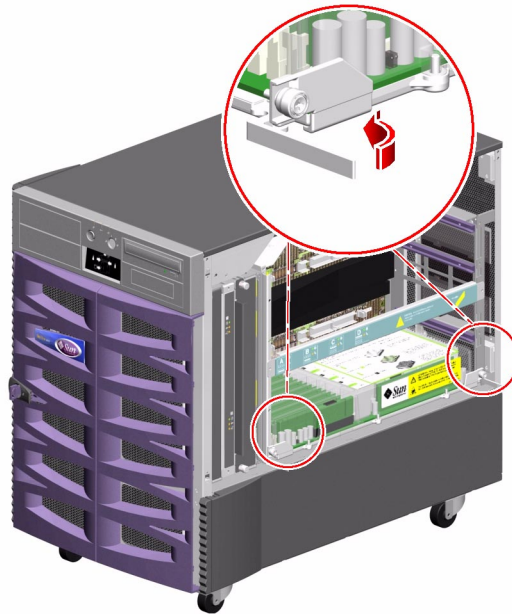
4. Make sure that the green ejection levers on the CPU/Memory board are rotated out at least 90 degrees.



5. Slide the CPU/Memory board into the guides in the chassis.

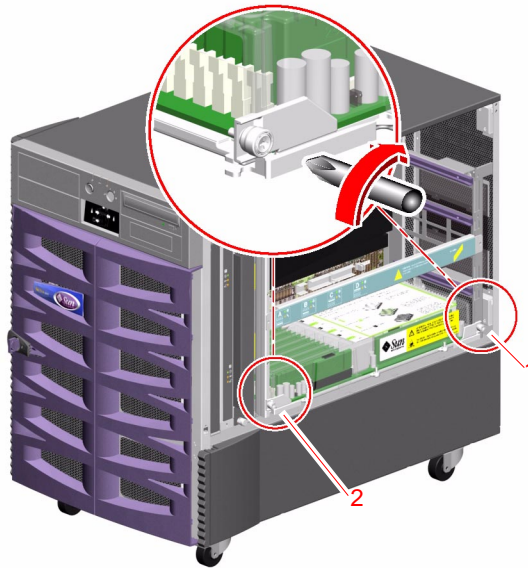
Slide the board into the system until the connectors on the board begin to engage the sockets on the motherboard and the ejection levers begin to contact the bracket.

6. Push in the two ejection levers simultaneously until the board is fully engaged in its slot.



7. Hand-tighten the two captive screws on the CPU/Memory board.

8. Using a No. 2 Phillips screwdriver, fully tighten the right-side captive screw and repeat for the left-side screw.



What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you installed this part as a new option, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

How to Remove a Memory Module

Before You Begin

Complete these tasks:

- Read the section, “About Memory Modules” on page 221
- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a CPU/Memory Board” on page 30

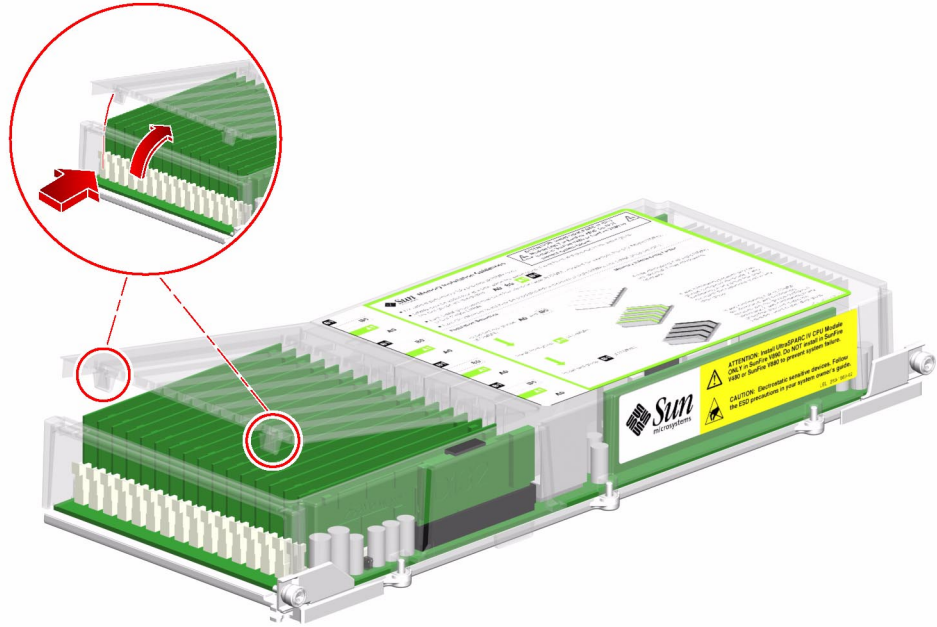
What to Do



Caution – Dual inline memory modules (DIMMs) are made of electronic components that are extremely sensitive to static electricity. Static electricity from your clothes or work environment can destroy the DIMM. Do not remove any DIMM from its antistatic packaging until you are ready to install it. Handle the modules only by their edges. Do not touch the components or any metal parts, including the gold contacts on the bottom edge of the module. Always wear a grounding strap when you handle the modules.

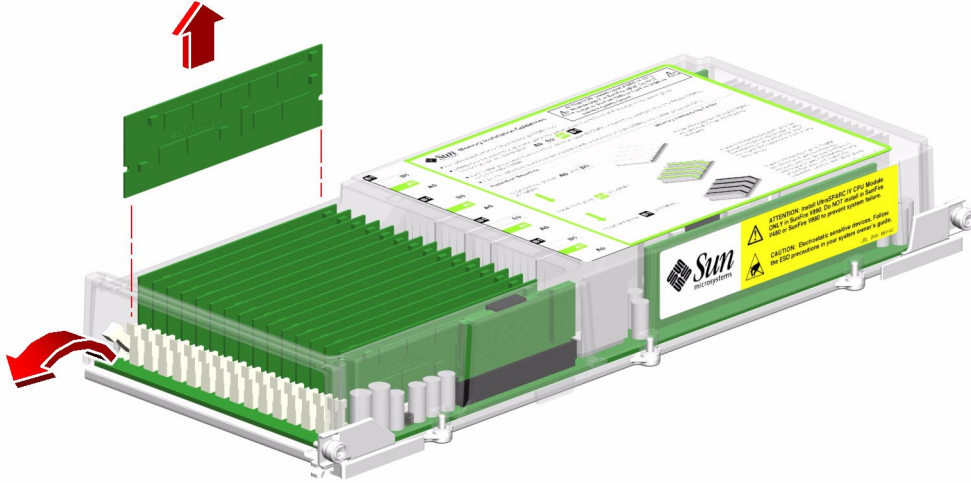
1. Remove the plastic cover on the CPU/Memory board.

Push the tabs inward until you can lift the cover free of the CPU/Memory board shroud.



2. Identify the memory module that you want to remove.

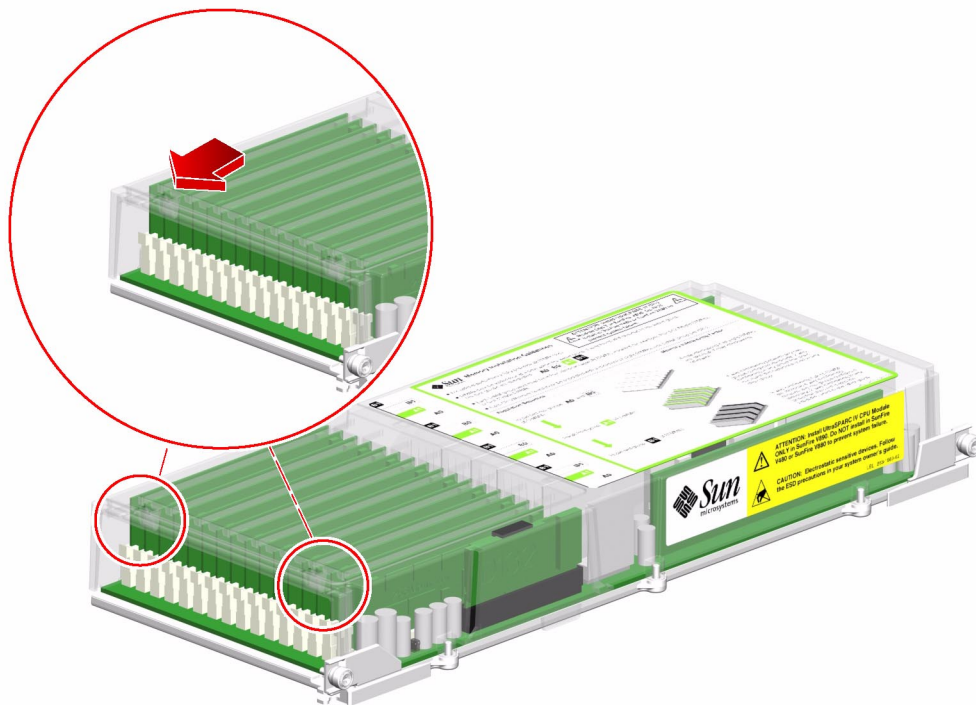
3. Push down on the ejection levers at each end of the memory module until the memory module pops out of its socket.
Apply even pressure on both levers.



4. Grasp the top corners of the memory module and pull it up and out of its socket.
5. Place the memory module on an antistatic mat.

6. If you are not installing replacement memory modules immediately, replace the plastic cover on the CPU/Memory board.

To fully engage the tabs on the cover, push both tabs at the same time until you hear a click.



What Next

To replace a memory module, complete this task:

- “How to Install a Memory Module” on page 44

To reassemble the system, complete these tasks:

- “How to Install a CPU/Memory Board” on page 34
- “How to Close a Side Door” on page 23

If you are not replacing the part right away, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the configuration change. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Install a Memory Module

Before You Begin

Complete these tasks:

- Read the section, “About Memory Modules” on page 221
- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a CPU/Memory Board” on page 30

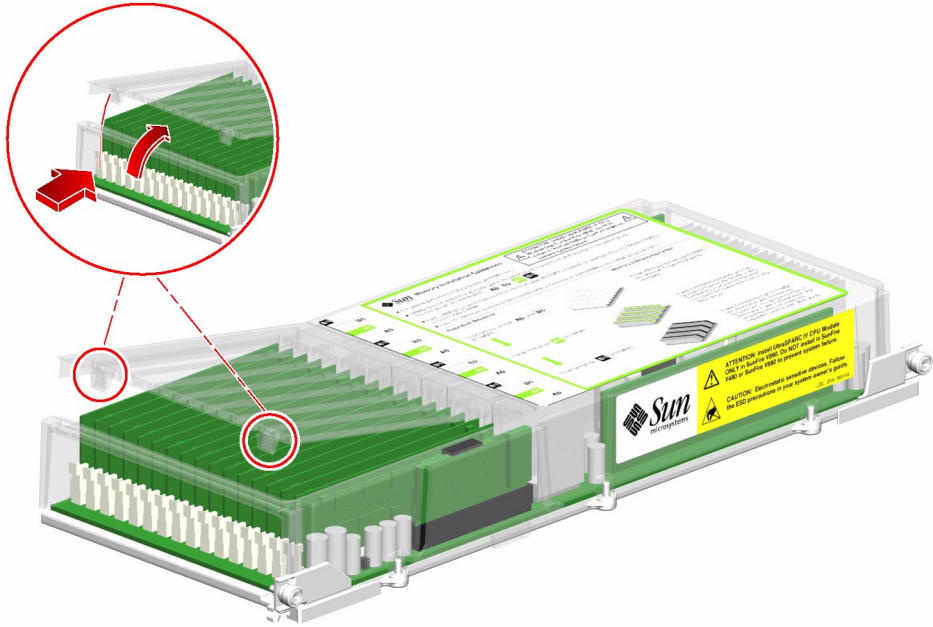
What to Do



Caution – Dual inline memory modules (DIMMs) are made of electronic components that are extremely sensitive to static electricity. Static electricity from your clothes or work environment can destroy the DIMM. Do not remove any DIMM from its antistatic packaging until you are ready to install it. Handle the modules only by their edges. Do not touch the components or any metal parts, including the gold contacts on the bottom edge of the module. Always wear a grounding strap when you handle the modules.

1. Remove the plastic cover on the CPU/Memory board.

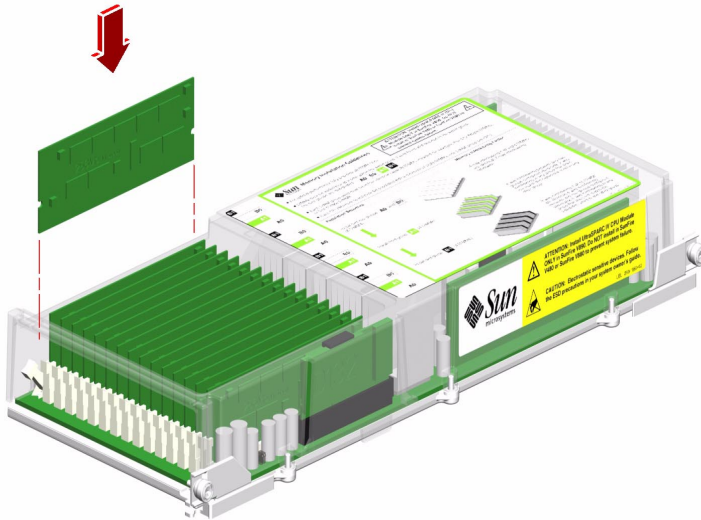
Push the tabs inward until you can lift the cover free of the CPU/Memory board shroud.



2. Locate the slot into which you will install the memory module.

3. Rotate outward the memory module ejection levers for that slot.

4. Holding the bottom edge of the module parallel to its socket, carefully align the module so that each of its contacts is centered on a socket pin.

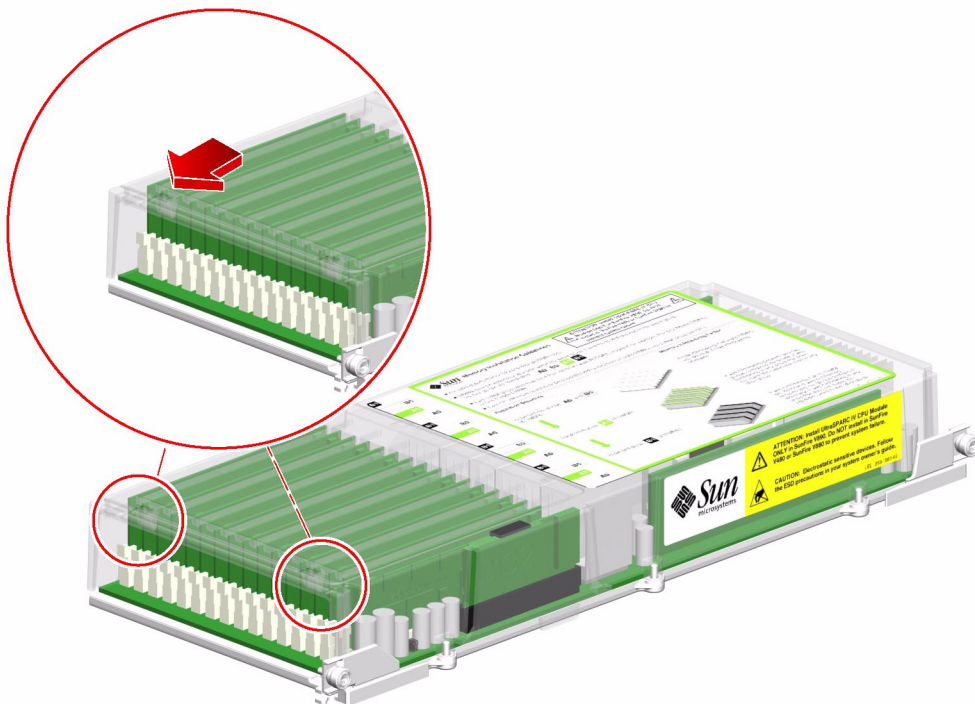


5. Push firmly and evenly on both ends of the memory module until its bottom edge is firmly seated in the socket.

You will hear a click when the ejection levers are in the locked position.

6. Replace the plastic cover on the CPU/Memory board.

To fully engage the tabs on the cover, push both tabs at the same time until you hear a click.



What Next

To reassemble the system, complete these tasks:

- “How to Install a CPU/Memory Board” on page 34
- “How to Close a Side Door” on page 23

If you installed this part as a new option, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

How to Remove a CPU Fan Tray



Caution – At least one CPU fan tray, one I/O fan tray, and one motherboard fan tray must be installed and operating to ensure proper system cooling; otherwise, the system will initiate an automatic thermal shutdown.

The primary CPU fan tray is in slot 1. If a CPU fan tray fails and you do not have a replacement available, leave the failed CPU fan tray installed to ensure proper system cooling. For more information about CPU fan trays, see “About Fan Trays” on page 235.

All fan trays feature a hot-swap capability. You can remove and replace a faulty fan tray without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.

Note – Use only Sun Fire V890 CPU fan trays in the Sun Fire V890 system.

Before You Begin

If you are not performing a hot-swap procedure, complete the following task:

- “How to Power Off the System” on page 5

Complete these tasks:

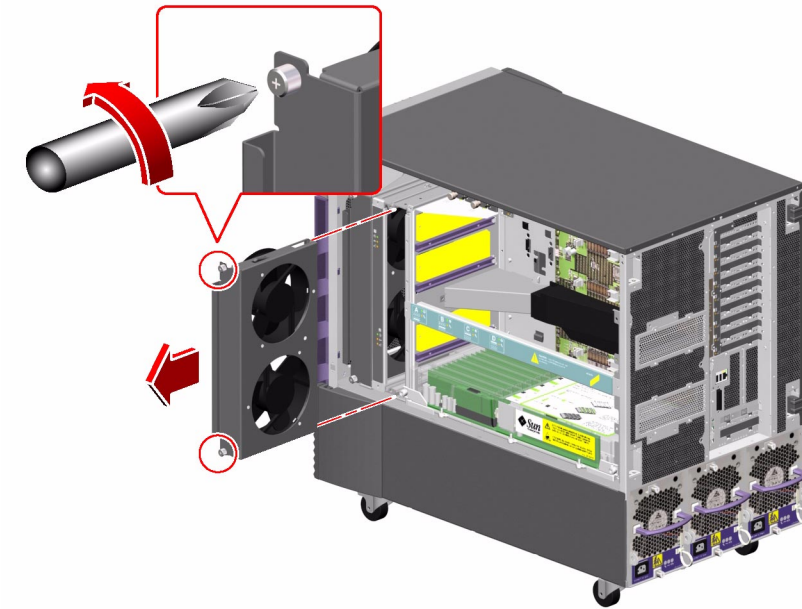
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Identify the CPU fan tray that you want to remove.

The primary CPU fan tray occupies CPU fan tray slot 1. For information about CPU fan tray LEDs, see “About Fan Tray LEDs” on page 268.

2. Loosen the two captive screws holding the CPU fan tray in the chassis.



3. Slide the fan tray out from the system.



Caution – If you are performing a hot-swap procedure, do not put your hand into the empty fan bay. The fans in the populated fan tray are still spinning.



Caution – You must install a replacement fan tray immediately to ensure proper system cooling.

What Next

Note – During a hot-swap operation, after you remove a fan tray or power supply, wait for an acknowledgement message on the system console before installing a replacement part; otherwise, the environmental monitoring software will not recognize the new device and false error conditions will result.

To replace the CPU fan tray, complete this task:

- “How to Install a CPU Fan Tray” on page 50

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Install a CPU Fan Tray

All fan trays feature a hot-swap capability. You can remove and replace a faulty fan tray without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.

Note – Use only Sun Fire V890 CPU fan trays in the Sun Fire V890 system.

Before You Begin

If you are not performing a hot-swap procedure, complete the following task:

- “How to Power Off the System” on page 5

Complete these tasks:

- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Identify the slot into which you want to install the CPU fan tray.**

The primary CPU fan tray occupies CPU fan tray slot 1. For information about CPU fan tray LEDs, see “About Fan Tray LEDs” on page 268.

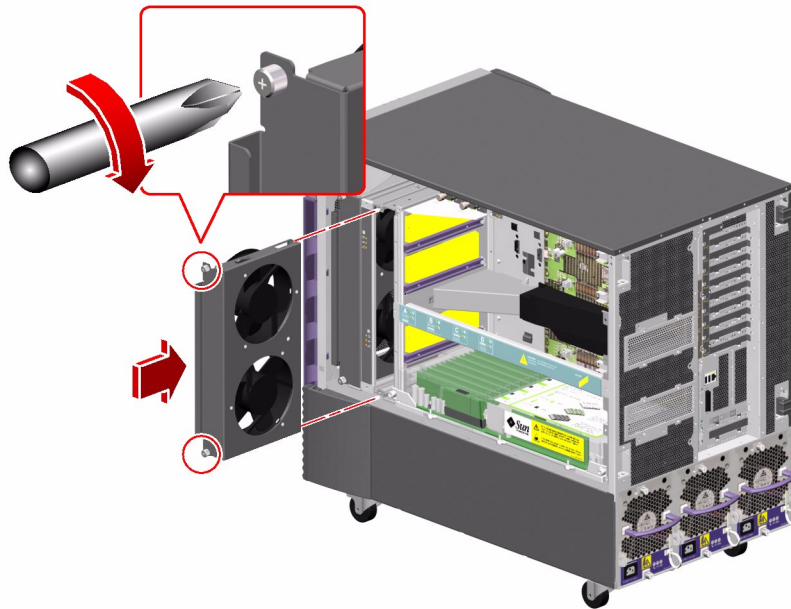


Caution – If you are performing a hot-swap procedure, do not put your hand into the empty fan bay. The fans in the populated fan tray are still spinning.

2. **Align the CPU fan tray with its slot in the chassis.**

The arrow label on the fan tray indicates the top side of the fan tray.

3. **Slide the fan tray into the chassis until the connector on the fan tray is firmly seated in its socket.**



4. **Tighten the two captive screws on the fan tray.**

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you installed this part as a new option while the system was powered off, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Remove a Motherboard Fan Tray



Caution – At least one CPU fan tray, one I/O fan tray, and one motherboard fan tray must be installed and operating to ensure proper system cooling; otherwise, the system will initiate an automatic thermal shutdown.

Note – The motherboard fan tray is also referred to as the I/O bridge fan tray by the system’s firmware and environmental software. For more information about motherboard fan trays, see “About Fan Trays” on page 235.

All fan trays feature a hot-swap capability. You can remove and replace a faulty fan tray without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.

Before You Begin

If you are not performing a hot-swap procedure, complete the following task:

- “How to Power Off the System” on page 5

Complete these tasks:

- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Identify the motherboard fan tray that you want to remove.

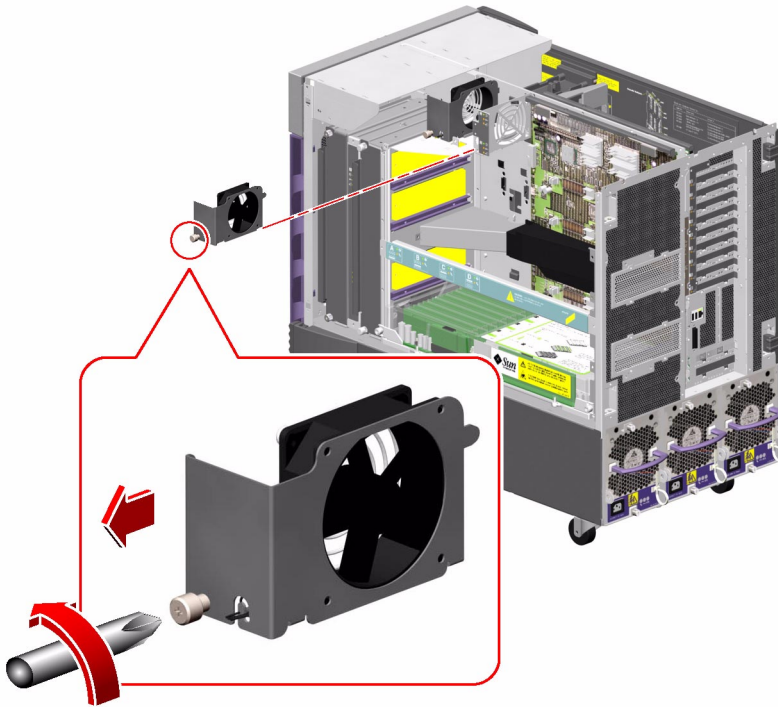
The primary motherboard fan tray occupies slot 5. The fan tray numbers are stamped into the chassis sheet metal at the base of each fan tray.

2. Unplug the motherboard fan tray cable from the fan tray you are going to remove.
If you are removing a redundant fan tray, drape the cable away from the other fan.



Caution – If you are performing a hot-swap procedure, do not put your hand into the empty fan bay. The fan in the populated fan tray is still spinning.

3. Loosen the captive screw on the fan tray you are going to remove.



4. If you are removing fan tray 5 and fan tray 6 is installed, disconnect the cable to fan tray 6 and drape it out of the way so that you can remove fan tray 5.

Note – When both motherboard fan trays are not operational in a running Sun Fire V890 system, the environmental monitoring software generates warning messages that the fan trays are removed. If an operational fan tray is not installed quickly, the system may initiate a thermal shutdown. During motherboard fan tray hot-swap procedures, to avoid these messages and potential cooling issues resulting in a system thermal shutdown, reconnect the motherboard fan tray cables for functional fans as soon as possible.

5. Slide the fan tray you are removing out of the system.
6. If you disconnected the cable to fan tray 6 to remove fan tray 5, reconnect the cable to fan tray 6.

If you disconnected the cable to fan tray 6 as part of a hot-swap procedure for fan tray 5 and you are immediately replacing fan tray 5, do not reconnect the cable to fan tray 6 until you install fan tray 5.

What Next

Note – During a hot-swap operation, after you remove a fan tray or power supply, wait for an acknowledgement message on the system console before installing a replacement part; otherwise, the environmental monitoring software will not recognize the new device and false error conditions will result.

To replace the motherboard fan tray, complete this task:

- “How to Install a Motherboard Fan Tray” on page 55

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Install a Motherboard Fan Tray

Note – The motherboard fan tray is also referred to as the I/O bridge fan tray by the system’s firmware and environmental software. For more information about motherboard fan trays, see “About Fan Trays” on page 235.

All fan trays feature a hot-swap capability. You can remove and replace a faulty fan tray without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.

Before You Begin

If you are not performing a hot-swap procedure, complete the following task:

- “How to Power Off the System” on page 5

Complete these tasks:

- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

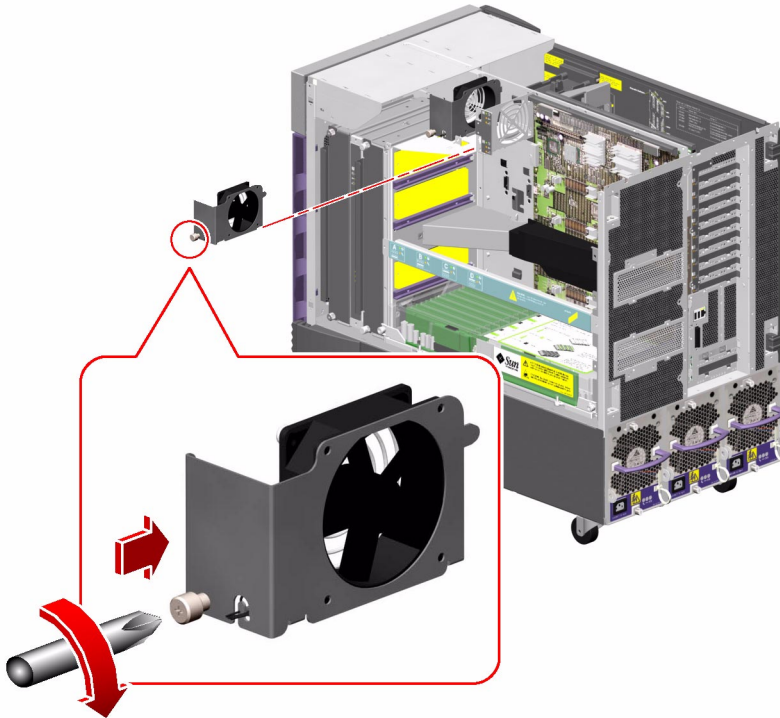
1. **Locate the slot into which you will install the motherboard fan tray.**
 - a. **If you are installing fan tray 5 and fan tray 6 is installed, disconnect the cable to fan tray 6.**

The primary motherboard fan tray occupies slot 5. The fan tray numbers are stamped into the chassis sheet metal at the base of each fan tray.

Note – When both motherboard fan trays are not operational in a running Sun Fire V890 system, the environmental monitoring software generates warning messages that the fan trays are removed. If an operational fan tray is not installed quickly, the system may initiate a thermal shutdown. During motherboard fan tray hot-swap procedures, to avoid these messages and potential cooling issues resulting in a system thermal shutdown, reconnect the motherboard fan tray cables for functional fans as soon as possible.

Note – Ensure that the fan tray cable is not in the path of the fan tray that you will install.

2. Align the fan tray to be installed with its plastic guide in the chassis.



3. Slide the fan tray into the chassis.
4. If you disconnected the cable to fan tray 6 to install fan tray 5, reconnect the cable to fan tray 6.



Caution – If you are performing a hot-swap procedure, do not put your hand into the empty fan bay. The fan in the populated fan tray is still spinning.

5. Tighten the captive screw on the fan tray.
6. Connect the motherboard fan tray cable to its connector.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you installed this part as a new option while the system was powered off, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Remove the CPU Fan Status Assembly

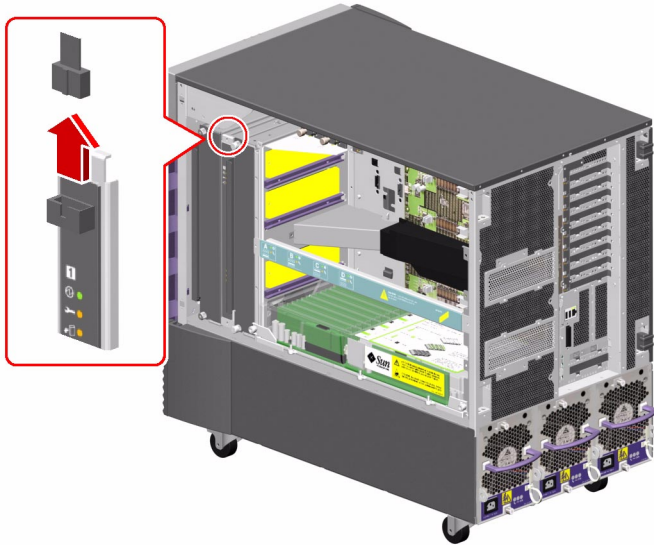
Before You Begin

Complete these tasks:

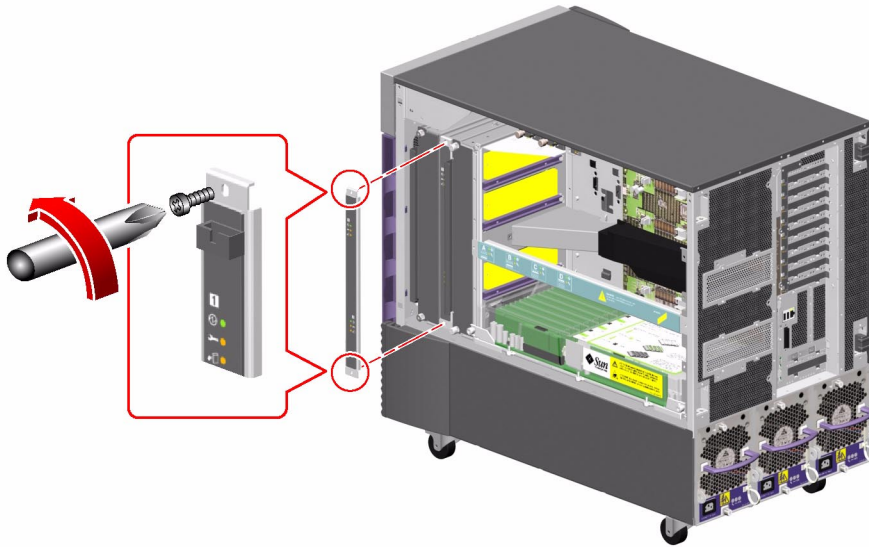
- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Disconnect the CPU fan status cable from the top of the assembly.**
Press the tab on the cable connector.



2. Remove the two Phillips screws securing the assembly to the chassis.



3. Carefully pull the fan status assembly out of the system and place it on an antistatic mat.

What Next

To replace the CPU fan status assembly, complete this task:

- “How to Install the CPU Fan Status Assembly” on page 60

How to Install the CPU Fan Status Assembly

Before You Begin

Complete this task:

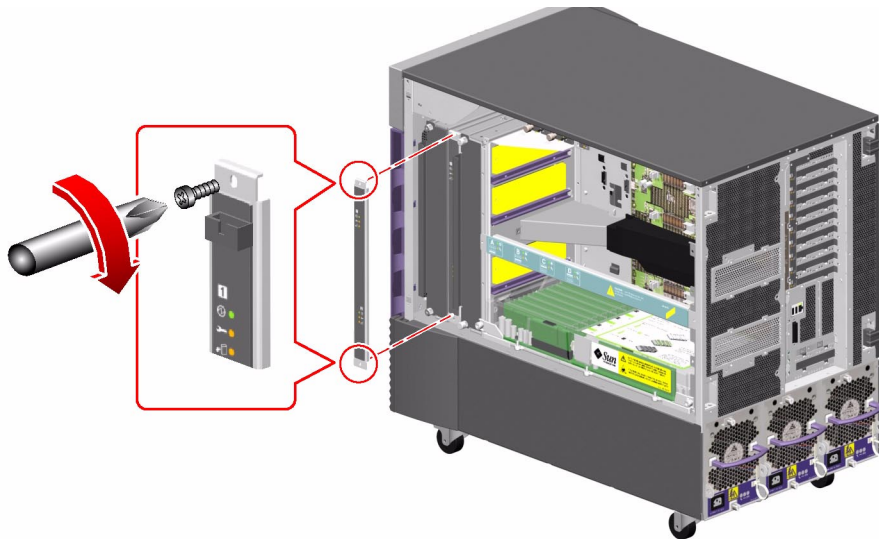
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

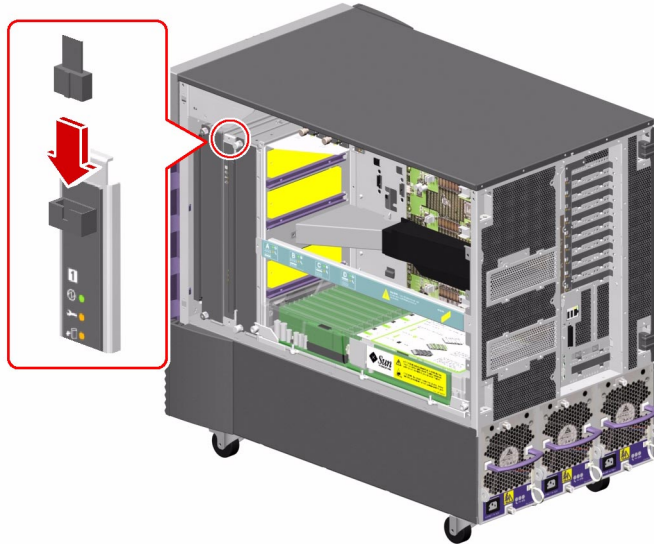
- 1. Position the fan status assembly into place in the system.**

The CPU fan status cable connector is on the top of the assembly. The sheet metal bracket is keyed on the bottom so that you can install the assembly only one way.

- 2. Fasten the two Phillips screws that attach the assembly to the chassis.**



3. Connect the fan tray status cable to the assembly.



What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Remove the CPU/Memory Board Status Assembly

Before You Begin

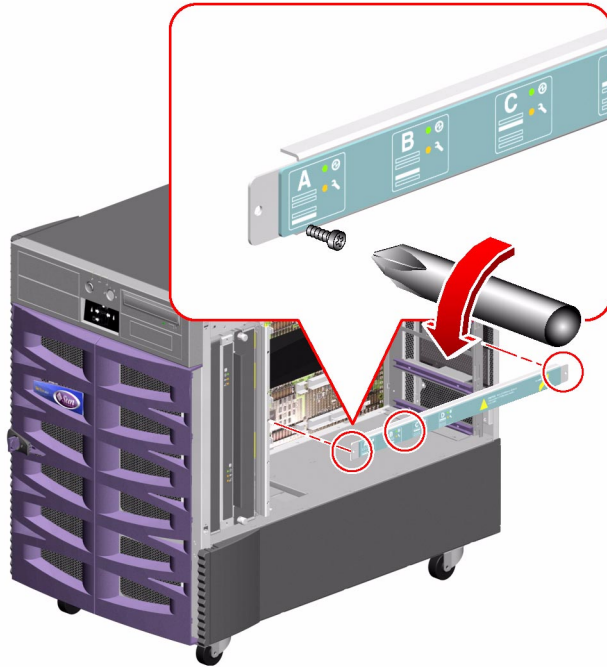
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Remove the two Phillips screws securing the status assembly to the chassis.**

Be sure to support the status assembly as you remove the screws so that the ribbon cable connected to the back of the assembly is not jarred.



2. **Disconnect the ribbon cable from the connector on the status assembly and remove the assembly from the system.**
3. **Place the status assembly on an antistatic mat.**

What Next

To replace the CPU/Memory board status assembly, complete this task:

- "How to Install the CPU/Memory Board Status Assembly" on page 63

How to Install the CPU/Memory Board Status Assembly

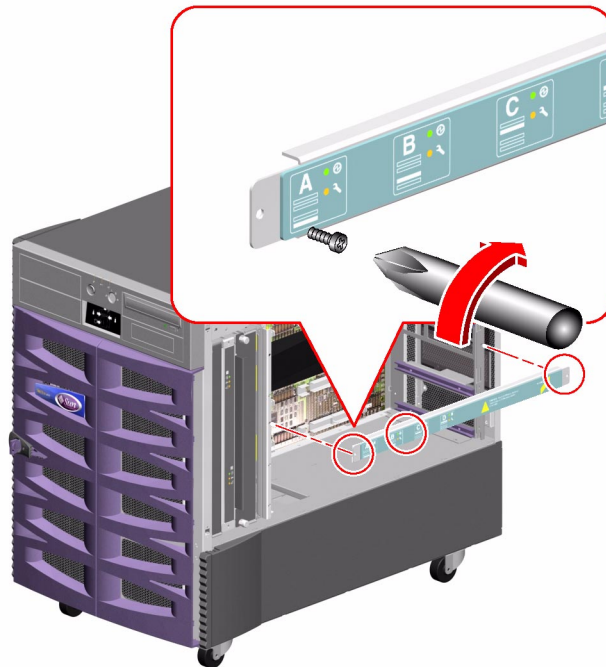
Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Connect the CPU/Memory board status cable to the connector on the back of the status assembly.
2. Place the status assembly into position and fasten the two Phillips screws that secure the assembly to the chassis.



What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Remove the Motherboard Fan Status Flex Circuit

Before You Begin

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Disconnect the motherboard fan status cable from the back of the flex circuit.**
2. **Remove the two Phillips screws securing the flex circuit to the bracket.**
3. **Remove the flex circuit from the system.**
4. **Place the flex circuit on an antistatic mat.**

What Next

To replace the motherboard fan status flex circuit, complete this task:

- “How to Install the Motherboard Fan Status Flex Circuit” on page 65

How to Install the Motherboard Fan Status Flex Circuit

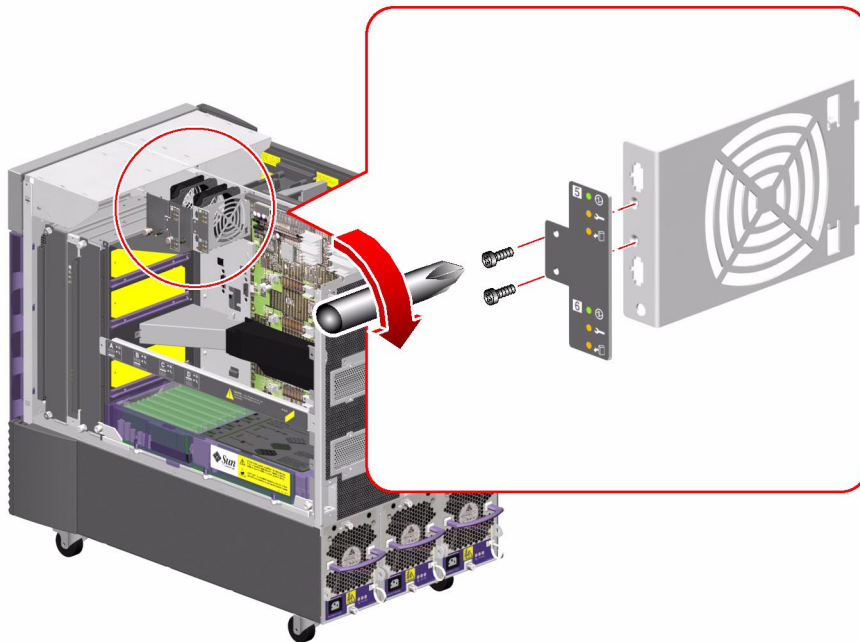
Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Position the flex circuit in the system and fasten the two Phillips screws that secure it to its bracket.



2. Connect the motherboard fan status cable to the connector on the back of the flex circuit.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Remove the Motherboard

Before You Begin

Complete these tasks:

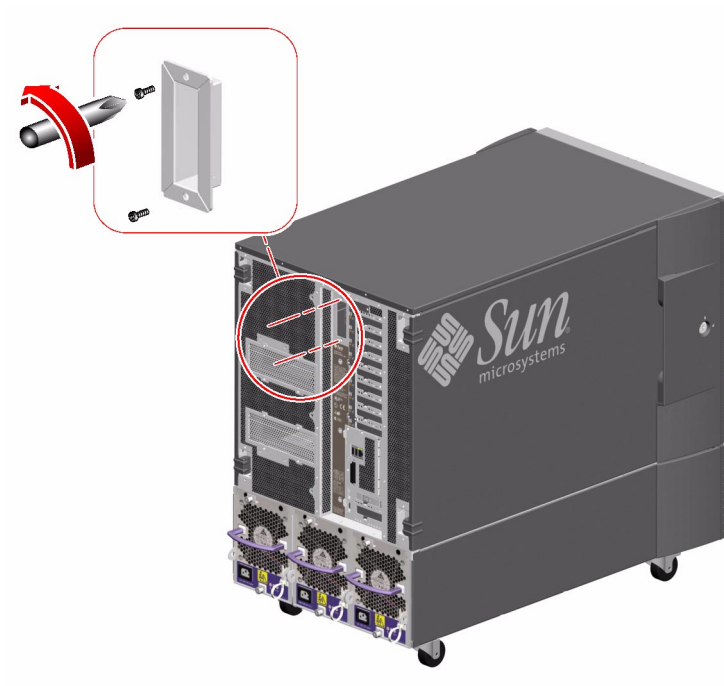
- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a CPU/Memory Board” on page 30
- “How to Remove the CPU/Memory Board Status Assembly” on page 61

What to Do

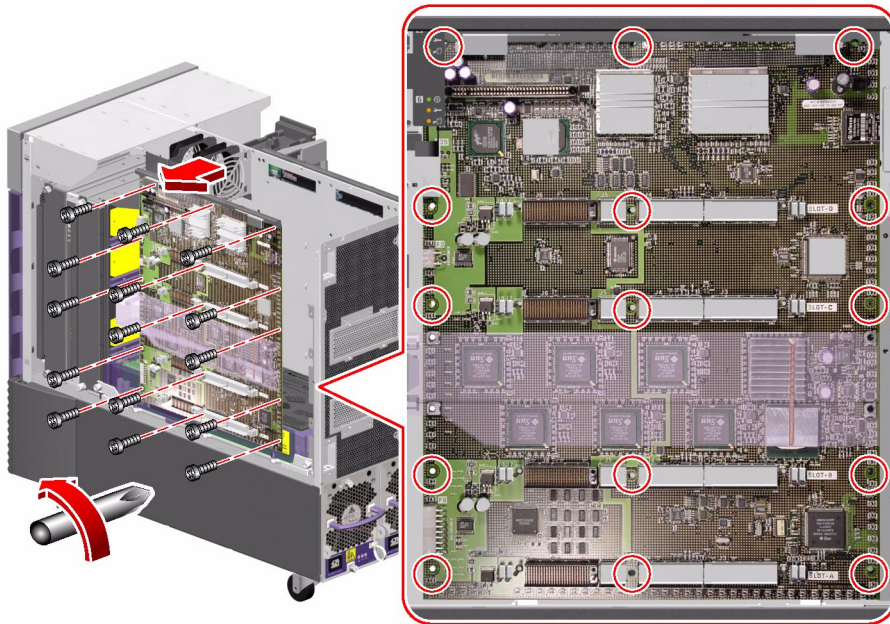
1. **Disconnect the CPU/Memory board status assembly cable (P35) from the motherboard at connector P35 (LED).**
2. **Disconnect the motherboard power cable (P8) from the motherboard at connector J4702 (Main Power).**
3. **Disconnect the motherboard power cable (P9) from the motherboard at connector J4701 (48 Volt Power).**
4. **Disconnect the base backplane FC-AL cable (A and B) from the motherboard at connectors A(FCALIN) and B(FCALOUT).**

5. Remove the Gigabit Ethernet housing from the rear panel.

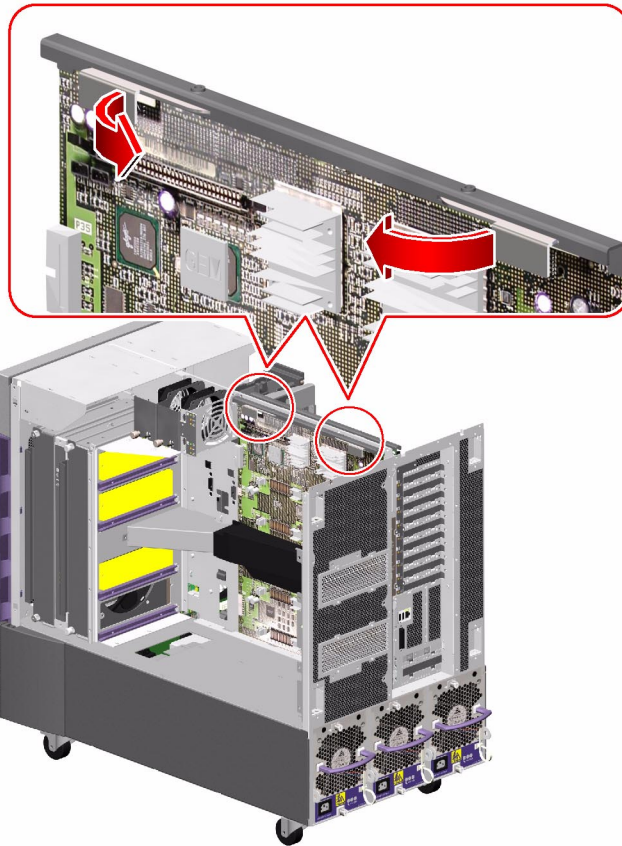
Remove the two Phillips screws securing the housing to the chassis rear panel.



6. Remove the 15 M4 Phillips screws securing the motherboard to the centerplane.



7. If the system I/O board is installed, disengage the motherboard from the system by rotating the two ejection levers away from the motherboard.



8. Remove the motherboard from the system.
 - a. Carefully pull the motherboard away from the centerplane so that the plastic motherboard air duct slides off the metal motherboard air guide.
 - b. Angle the motherboard to avoid the motherboard fan status flex circuit as you pull the motherboard out from the system.
9. Place the motherboard on an antistatic mat.
10. Transfer the CPU/Memory board connector dust covers from the replacement motherboard to the faulty motherboard.

What Next

To replace the motherboard, complete this task:

- “How to Install the Motherboard” on page 70

How to Install the Motherboard

Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

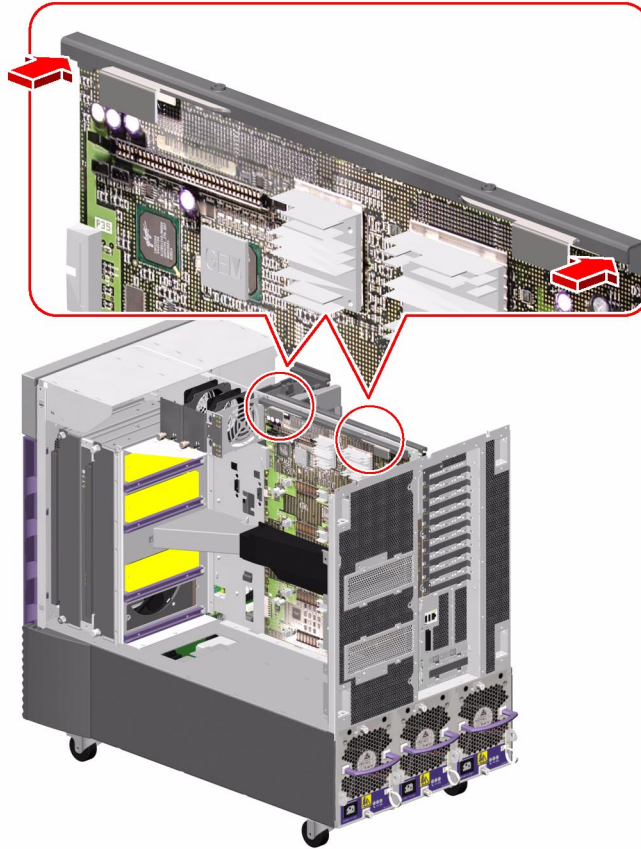
What to Do

- 1. If you are installing a new motherboard, remove the CPU/Memory board connector dust covers from every slot into which you will install a CPU/Memory board.**
Keep dust covers on any unused slots.
- 2. Carefully position the motherboard in the chassis against the centerplane.**
 - a. Angle the motherboard into the system so that you do not hit the motherboard fan status assembly.**
 - b. Carefully slide the plastic motherboard air duct over the metal motherboard air guide.**
 - c. Use the two guideposts that fit through two holes near the top of the motherboard to align the motherboard against the centerplane.**

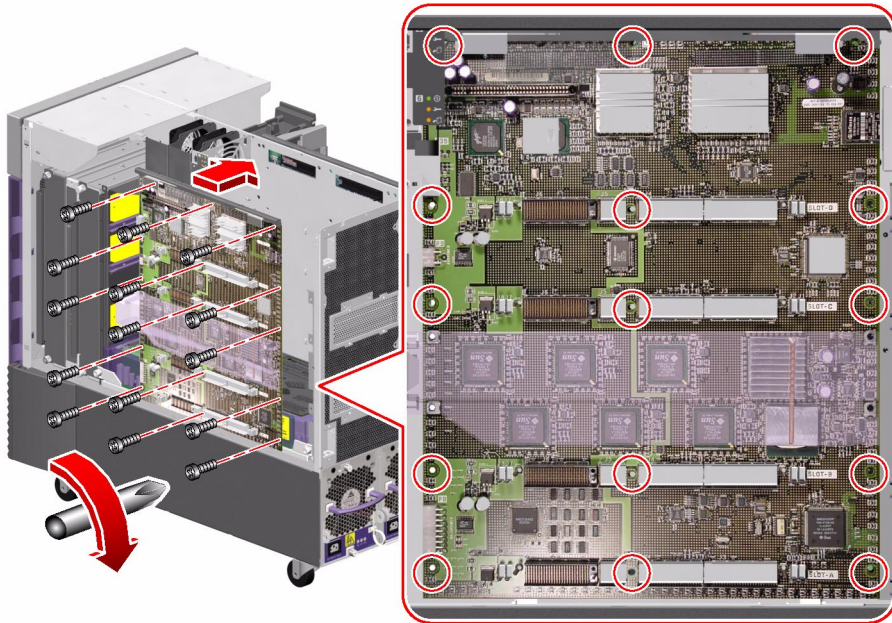
3. If the system I/O board is installed, seat the motherboard in the system by evenly and firmly pushing on the top outer ends of the motherboard stiffener and ejection assembly.



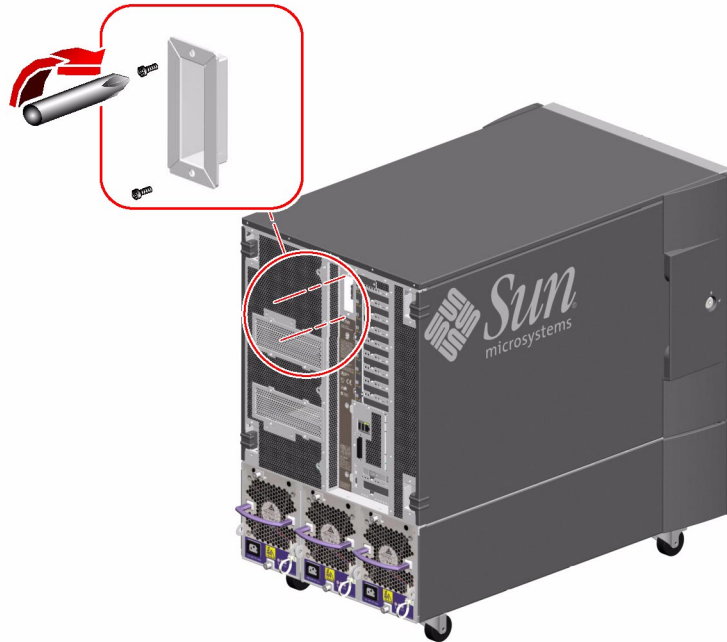
Caution – Do not push on the ejection levers to seat the motherboard in the system.



4. Replace the 15 M4 Phillips screws that secure the motherboard in the chassis.
 - a. Insert the top center screw and tighten it by two turns.
 - b. Insert the screw directly beneath the top center screw and tighten it by two turns.
 - c. Insert the top left and right screws and tighten them by two turns.
 - d. Repeat this pattern for the remaining screws until they are all installed.
 - e. Fully tighten the screws in the pattern described until the board is fully seated.



5. Replace the two Phillips screws that secure the Gigabit Ethernet connector housing to the rear panel.



6. Connect the motherboard power cable (P8) to the motherboard at connector J4702 (Main Power).
7. Connect the motherboard power cable (P9) to the motherboard at connector J4701 (48 Volt Power).
8. Connect the base backplane FC-AL cable (A and B) to the motherboard at connectors A(FCALIN) and B(FCALOUT).
9. Connect the CPU/Memory board status assembly cable (P35) to the motherboard at connector P35.

What Next

To reassemble the system, complete these tasks:

- “How to Install the CPU/Memory Board Status Assembly” on page 63
- “How to Install a CPU/Memory Board” on page 34
- “How to Close a Side Door” on page 23

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

Servicing the Input/Output Board Side Components

This chapter describes how to remove and replace the system input/output (I/O) board and components on the I/O side of the system. For a list of part numbers for field-replaceable units (FRUs) and optional equipment, see “Illustrated Parts Breakdown” on page 249.

The following tasks are covered in this chapter:

- “How to Remove an I/O Fan Tray” on page 76
- “How to Install an I/O Fan Tray” on page 78
- “How to Remove a PCI Card” on page 80
- “How to Install a PCI Card” on page 83
- “How to Remove the System Controller Card” on page 87
- “How to Install the System Controller Card” on page 91
- “How to Remove the Sun StorEdge PCI Dual Fibre Channel Host Adapter Card” on page 94
- “How to Install the Sun StorEdge PCI Dual Fibre Channel Host Adapter Card” on page 98
- “How to Remove the PCI Internal LED Flex Circuit” on page 102
- “How to Install the PCI Internal LED Flex Circuit” on page 104
- “How to Remove the PCI External LED Flex Circuit” on page 106
- “How to Install the PCI External LED Flex Circuit” on page 107
- “How to Remove the I/O Fan LED Flex Circuit” on page 109
- “How to Install the I/O Fan LED Flex Circuit” on page 111
- “How to Remove the System ID PROM” on page 112
- “How to Install the System ID PROM” on page 114
- “How to Remove the I/O Board” on page 116
- “How to Install the I/O Board” on page 124

How to Remove an I/O Fan Tray



Caution – At least one CPU fan tray, one I/O fan tray, and one motherboard fan tray must be installed and operating to ensure proper system cooling; otherwise, the system will initiate an automatic thermal shutdown.

All fan trays feature a hot-swap capability. You can remove and replace a faulty fan tray without shutting down the operating system or turning off the system power. However, at least one working I/O fan tray must be present in order to provide proper system cooling. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6. For more information about I/O fan trays, see “About Fan Trays” on page 235.

Before You Begin

If you are not performing a hot-swap procedure, complete the following task:

- “How to Power Off the System” on page 5

Complete these tasks:

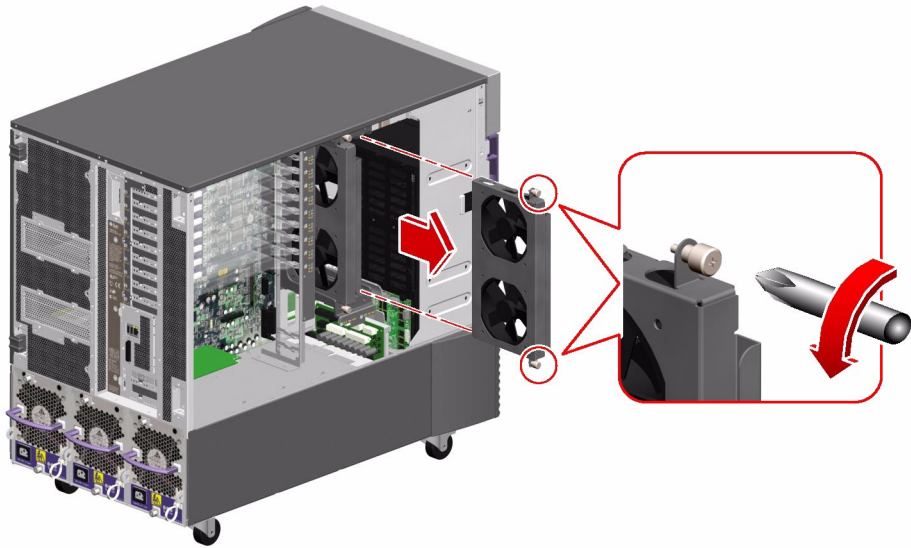
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Identify the fan tray that you want to remove.

The primary I/O fan tray is in slot 3. For information about I/O fan tray LEDs, see “About Fan Tray LEDs” on page 268.

2. Loosen the two captive Phillips screws securing the fan tray to the brackets.



3. Slide the fan tray out from the brackets.



Caution – If you are performing a hot-swap procedure, do not put your hand into the empty fan bay. The fans in the populated fan tray are spinning.

What Next

Note – During a hot-swap operation, after you remove a fan tray or power supply, wait for an acknowledgement message on the system console before installing a replacement part; otherwise, the environmental monitoring software will not recognize the new device and false error conditions will result.

To replace the I/O fan tray, complete this task:

- “How to Install an I/O Fan Tray” on page 78

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Install an I/O Fan Tray

All fan trays feature a hot-swap capability. You can remove and replace a faulty fan tray without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6. For more information about I/O fan trays, see “About Fan Trays” on page 235.

Before You Begin

If you are not performing a hot-swap procedure, complete the following task:

- “How to Power Off the System” on page 5

Complete these tasks:

- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

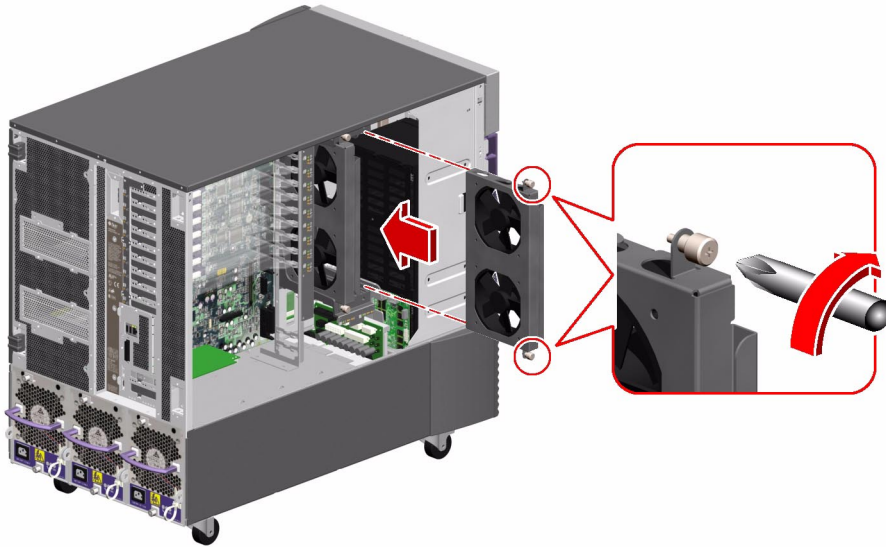
1. **Locate the I/O fan tray slot into which you want to install the fan tray.**
2. **Slide the fan tray into the brackets until the connector on the fan tray is fully seated into its socket.**

The label on the I/O fan tray indicates the orientation of the fan tray.



Caution – If you are performing a hot-swap procedure, do not put your hand into the empty fan bay. The fans in the populated fan tray are spinning.

3. Tighten the two captive Phillips screws that secure the fan tray to the brackets.



What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you installed this part as a new option while the system was powered off, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Remove a PCI Card

Before You Begin

PCI cards are hot-pluggable provided the system is running a version of the Solaris Operating System that supports PCI card hot-plug operations. See the *Sun Fire V890 Server Product Notes* for important information about PCI card hot-plug support.

If you are removing a PCI card as part of a hot-plug procedure, you must perform preliminary software commands to prepare the system before removing the card. In addition, certain other system requirements must be met in order for hot-plug operations to succeed. For more details about PCI card hot-plug procedures and system requirements, see:

- “About Hot-Pluggable and Hot-Swappable Components” on page 6
- *Sun Fire V890 Dynamic Reconfiguration User’s Guide*, which is available at <http://www.sun.com>, under Solaris on Sun Hardware.

Note – PCI and disk hot-plug operations are not supported when the system ok prompt is displayed. You can only perform these hot-plug operations while the operating system is running.

For information about PCI cards, see “About PCI Cards and Buses” on page 226.

If you are not performing a hot-plug procedure, complete the following task:

- “How to Power Off the System” on page 5

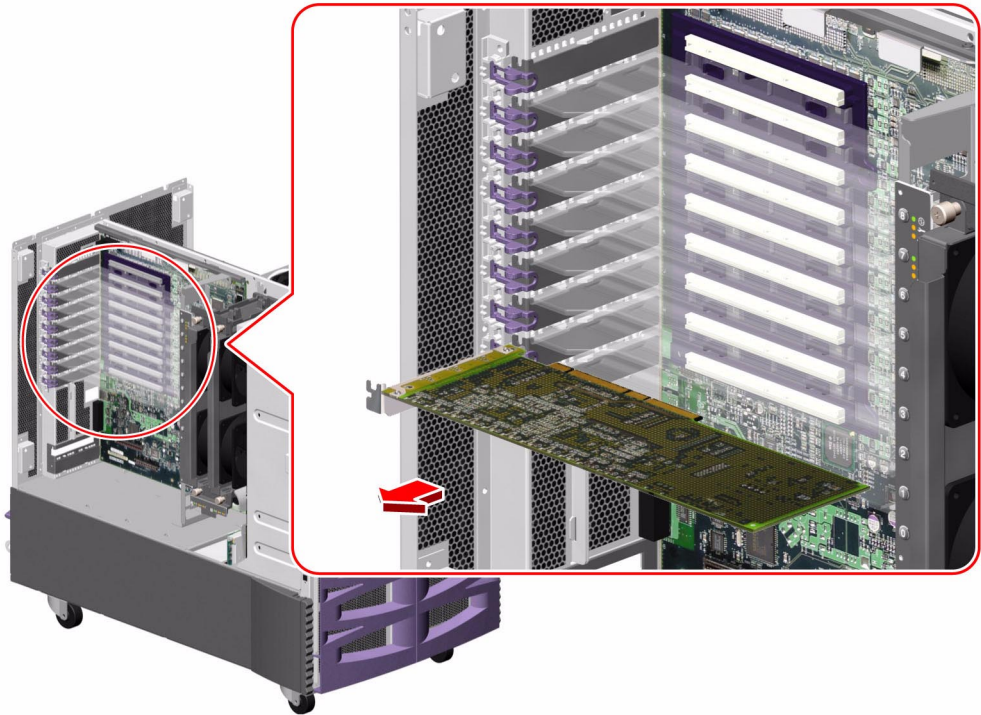
Complete these tasks:

- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

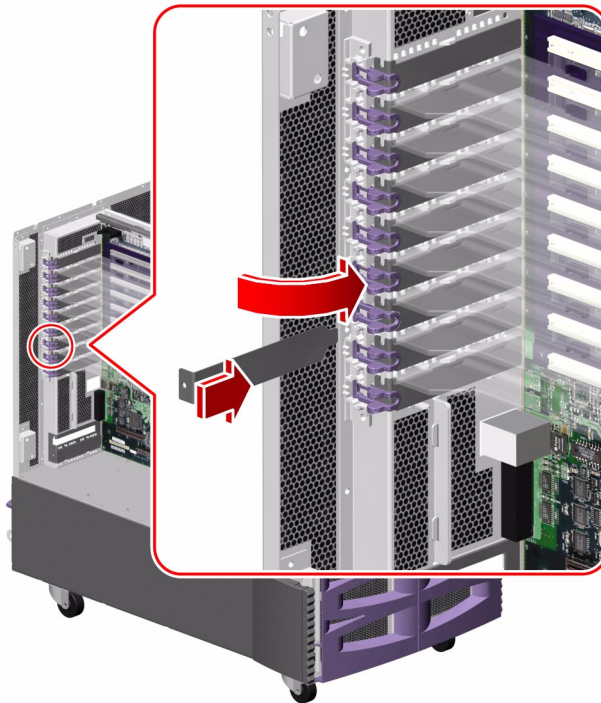
What to Do

1. Identify the PCI card that you want to remove.
2. Disconnect all external cables connected to the PCI card faceplate.
3. Disconnect all internal cables connected to the PCI card.

4. Pinch the PCI card retaining clip until it releases from the back of the card and rotate the clip outward.
5. Carefully pull the PCI card from the I/O board.



6. Place the PCI card on an antistatic mat.
7. If you are not replacing the PCI card immediately, install a PCI filler panel into the system rear panel.
 - a. Slide a PCI filler panel into the slot on the system rear panel.
 - b. Rotate the PCI retaining clip over the back of the filler panel until it snaps into place.



What Next

To replace the PCI card, complete this task:

- “How to Install a PCI Card” on page 83

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you removed this part while the system was powered off, and you are not replacing the part right away, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the configuration change. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Install a PCI Card

Before You Begin

PCI cards are hot-pluggable provided the system is running a version of the Solaris Operating System that supports PCI card hot-plug operations. See the *Sun Fire V890 Server Product Notes* for important information about PCI card hot-plug support.

If you are installing a PCI card as part of a hot-plug procedure, you must perform preliminary software commands to prepare the system before installing the card. In addition, certain other system requirements must be met in order for hot-plug operations to succeed. For more details about PCI card hot-plug procedures and system requirements, see:

- “About Hot-Pluggable and Hot-Swappable Components” on page 6
- *Sun Fire V890 Dynamic Reconfiguration User’s Guide*, which is available at <http://www.sun.com>, under Solaris on Sun Hardware]

Note – PCI and disk hot-plug operations are not supported when the system ok prompt is displayed. You can only perform these hot-plug operations while the operating system is running.

If you are not performing a hot-plug procedure, complete the following task:

- “How to Power Off the System” on page 5

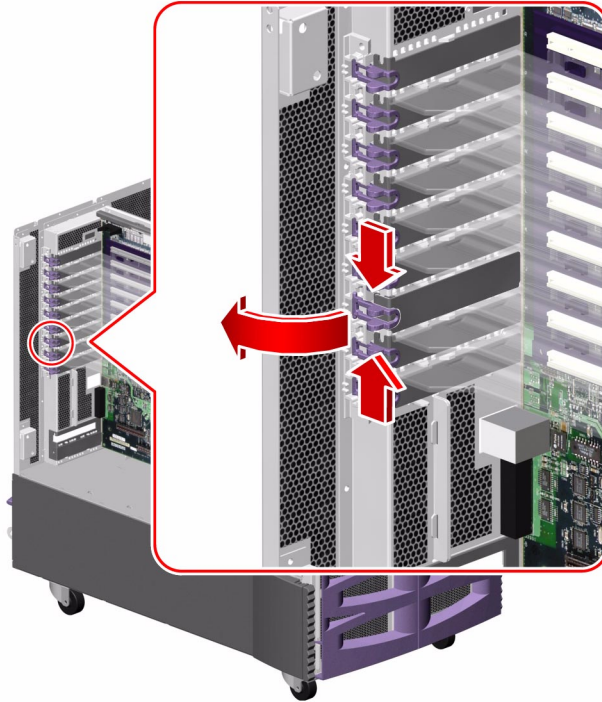
Complete these tasks:

- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

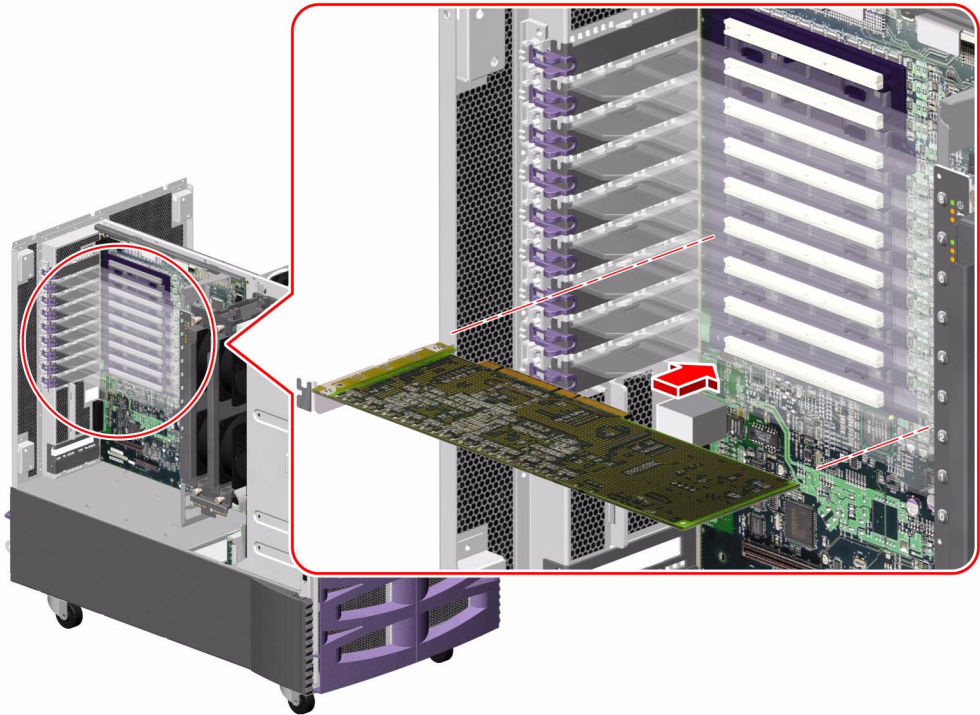
What to Do

1. Identify the slot into which you want to install the PCI card.

2. Remove the PCI filler panel from the back of the system.
 - a. Pinch the PCI card retaining clip until it releases from the top of the filler panel and rotate the clip outward.
 - b. Slide the filler panel out from the rear panel.



3. Insert the PCI card into the appropriate slot on the I/O board.



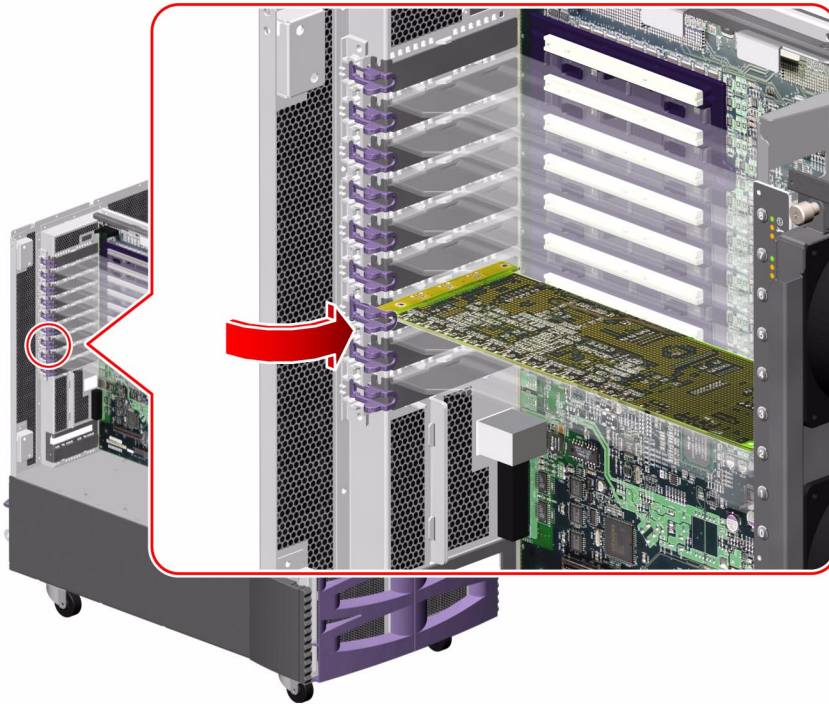
If you are installing a PCI long card:

- a. Insert the faceplate side of the PCI card into the appropriate opening on the rear panel. At the same time, insert the other end of the card into the corresponding groove on the PCI card bracket.**
- b. Push the card into the slot on the I/O board until it is fully seated.**

If you are installing a PCI short card:

- a. Align the faceplate side of the PCI card with the appropriate opening on the rear panel.**
- b. Push the card into the slot on the I/O board until it is fully seated.**

4. Rotate the PCI retaining clip over the back of the PCI card faceplate until it snaps into place.



5. If necessary, connect any internal cables to the PCI card's internal connectors.
6. If necessary, connect any external cables to the PCI card.

What Next

To reassemble the system, complete this task:

- "How to Close a Side Door" on page 23

If you are installing a PCI card as part of a hot-plug procedure, you must issue software commands to reconfigure the operating system after installing the new card. For more details about PCI card hot-plug procedures and system requirements, see

- “About Hot-Pluggable and Hot-Swappable Components” on page 6
- *Sun Fire V890 Dynamic Reconfiguration User’s Guide*, which is available at <http://www.sun.com>, under Solaris on Sun Hardware

If you installed this part as a new option while the system was powered off, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operations* on the Sun Fire V890 Documentation CD.

How to Remove the System Controller Card



Caution – *The system controller card is not a hot-pluggable component.* You must shut down the system and disconnect all the power cords from the system before performing this procedure.

Before You Begin

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

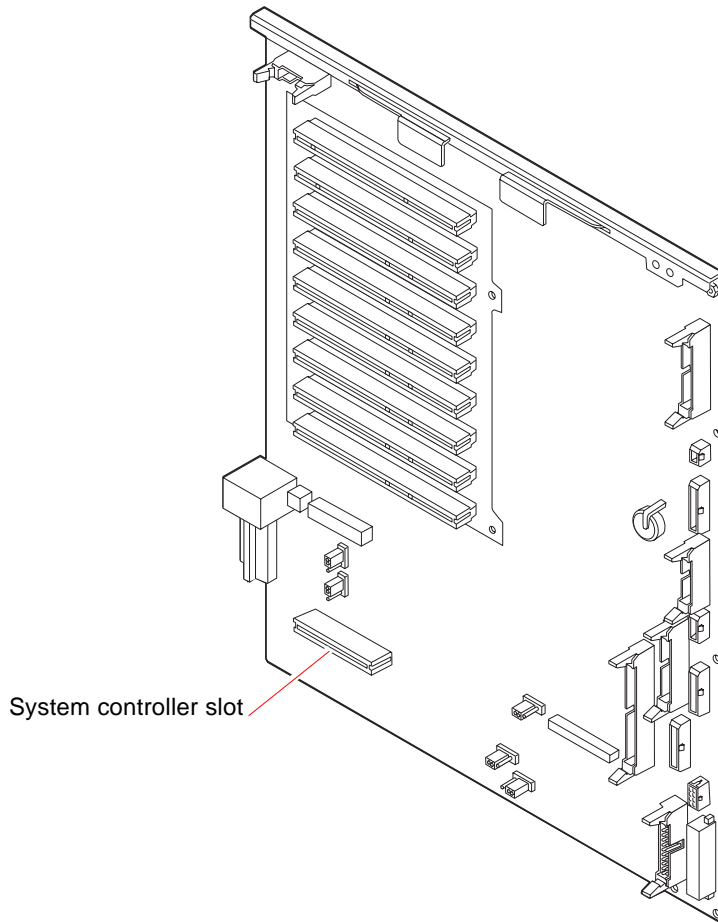
1. Disconnect the AC power cords from the power supplies.



Caution – If you are using an antistatic wrist strap to protect against electrostatic discharge, connect it to a properly grounded surface, such as a nearby equipment rack, or a nearby system that is connected to a power source.

2. Locate the system controller card.

The system controller card is installed in a slot on the system I/O board. It is labeled “SC” on the rear panel.

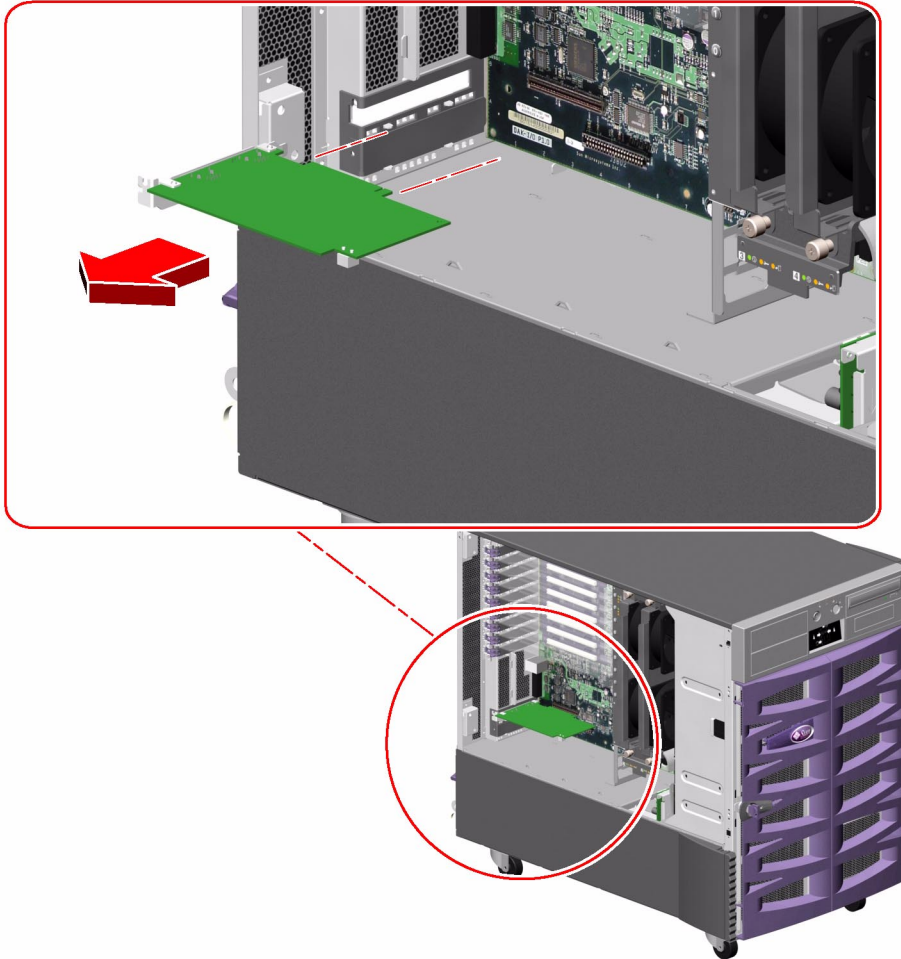


3. **Disconnect any external cable(s) attached to the faceplate of the system controller card.**
4. **Using a Phillips No. 1 screwdriver, remove the screw securing the card to the system rear panel.**
5. **Pull the system controller card from its slot.**

Hold the system controller card by the faceplate and its opposite edge, and pull up while carefully rocking the card from end to end until it is freed from its slot.



Caution – Do not apply excessive force to one end or one side of the card. Doing so could damage the card.



6. Place the system controller card on an antistatic mat.

What Next

To replace the system controller card, complete this task:

- “How to Install the System Controller Card” on page 91

How to Install the System Controller Card



Caution – *The system controller card is not a hot-pluggable component. You must shut down the system and disconnect all the power cords from the system before performing this procedure.*

Before You Begin



Caution – If you are using an antistatic wrist strap to protect against electrostatic discharge, connect it to a properly grounded surface, such as a nearby equipment rack, or a nearby system that is connected to a power source.

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

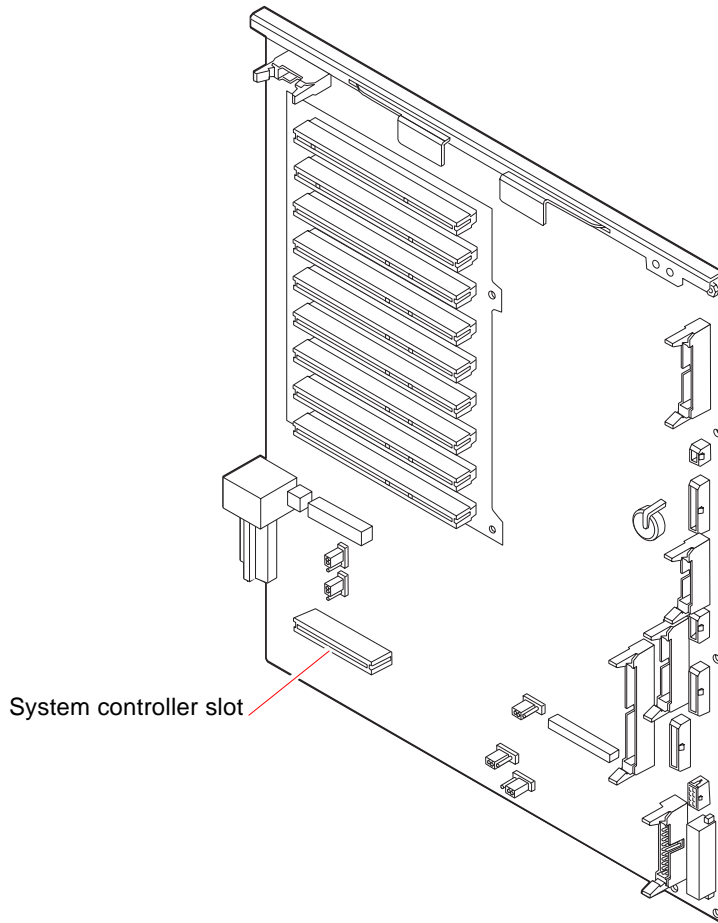
What to Do

1. **Locate the slot for the system controller card, near the bottom of the system I/O board.**

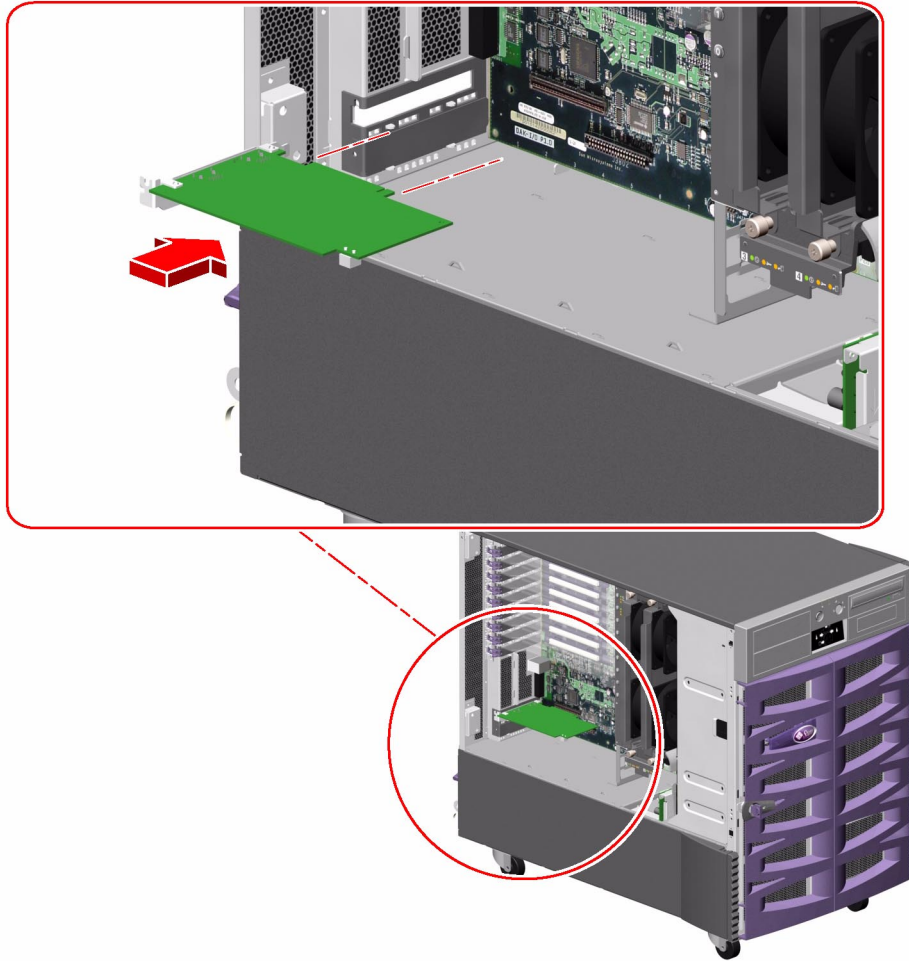


Caution – If you are using an antistatic wrist strap to protect against electrostatic discharge, connect it to a properly grounded surface, such as a nearby equipment rack, or a nearby system that is connected to a power source.

Make sure to install the system controller card into the system controller slot (marked "SC" on the rear panel of the server). Although the system controller card can physically fit into a PCI slot, it will not function if installed there.



2. Insert the system controller card into its slot on the system I/O board.
 - a. Insert the faceplate end of the card into the appropriate opening in the rear panel.
 - b. Insert the opposite end of the card into the appropriate card guide so that the system controller card is aligned evenly with the connectors on the I/O board.
 - c. Push the card into the connectors on the system I/O board.
Apply even pressure along the edge of the card.



3. Secure the system controller card faceplate to the rear panel with the Phillips screw.
4. Connect the Ethernet and/or serial cable to the appropriate connector on the system controller card faceplate.
5. Reconnect the AC power cords to the power supplies.

What Next

The system controller hardware runs Remote System Control (RSC) software. After replacing the system controller card, you must restore the RSC configuration settings by running the RSC server configuration script. In addition, the replacement card has a new Ethernet MAC address, which may necessitate configuration changes to other network devices. To determine the Ethernet MAC address for the new system controller card, use the RSC shell command `shownetwork`. For more information, see the *Remote System Control (RSC) 2.2 User's Guide*, which is available on the Sun Fire V890 Documentation CD.

To reassemble the system, complete this task:

- "How to Close a Side Door" on page 23

How to Remove the Sun StorEdge PCI Dual Fibre Channel Host Adapter Card

For information about FC-AL host adapters, see your *Sun Fire V890 Server Owner's Guide*.

Before You Begin

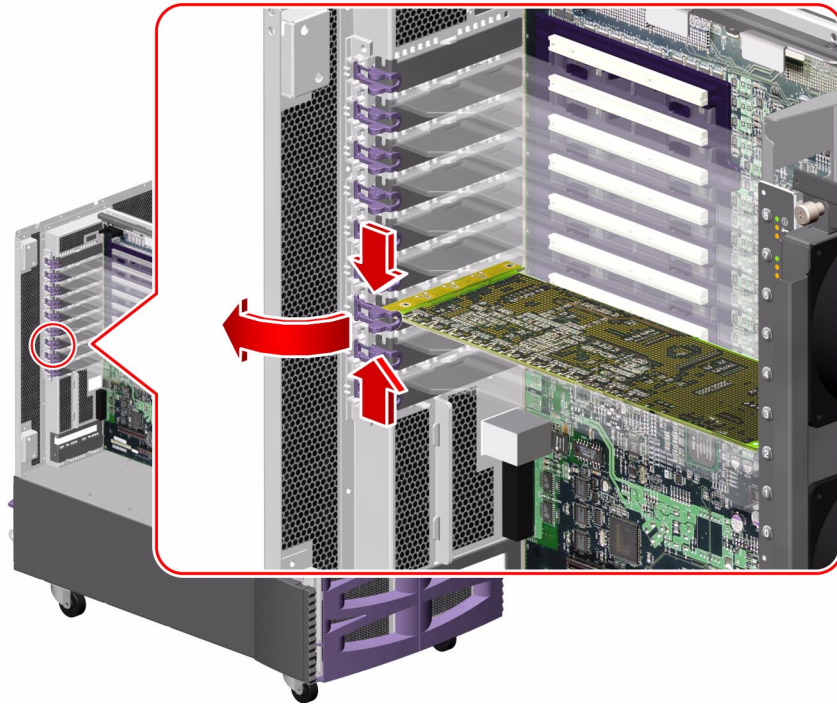
Complete these tasks:

- "How to Power Off the System" on page 5
- "How to Open and Remove a Side Door" on page 21
- "How to Avoid Electrostatic Discharge" on page 26

What to Do

1. **Locate the Sun StorEdge PCI Dual Fibre Channel Host Adapter card.**
2. **Disconnect any internal and external cable(s) attached to the card.**

3. Pinch the PCI card retaining clip until it releases from the back of the card and rotate the clip outward.

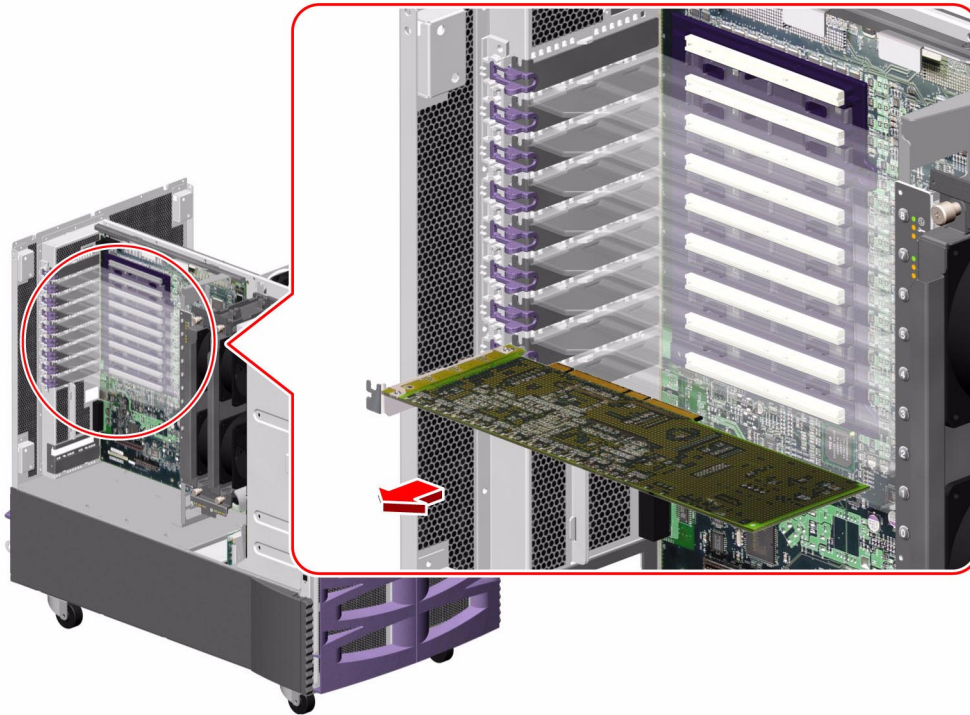


4. Carefully pull the Sun StorEdge PCI Dual Fibre Channel Host Adapter card from the I/O board.

Hold the card by the faceplate and its opposite edge, and pull up while carefully rocking the card from end to end until it is freed from its slot.

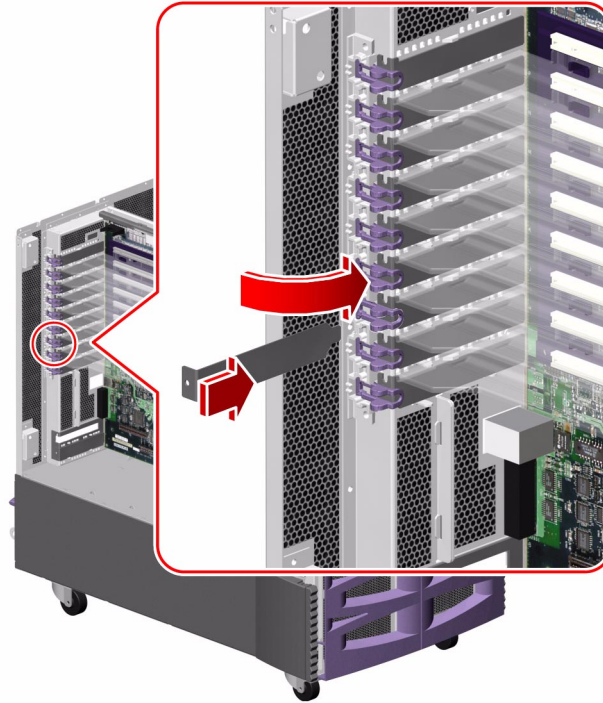


Caution – Do not apply excessive force to one end or one side of the card. Doing so could damage the card.



5. Place the card on an antistatic mat.
6. If you are not immediately replacing the Sun StorEdge PCI Dual Fibre Channel Host Adapter card, install a PCI filler panel into the system rear panel.
 - a. Slide a PCI filler panel into the slot on the system rear panel.

- b. Rotate the PCI retaining clip over the back of the filler panel until it snaps into place.



7. If you are not immediately replacing the card, remove the Sun StorEdge PCI Dual Fibre Channel Host Adapter FC-AL cable from the system.
 - a. Disconnect the FC-AL cable (D and C) from connectors D and C on the base FC-AL backplane.
 - b. Remove the cable from the three tie-wraps on the chassis power bay.

What Next

To replace the Sun StorEdge PCI Dual Fibre Channel Host Adapter card, complete this task:

- “How to Install the Sun StorEdge PCI Dual Fibre Channel Host Adapter Card” on page 98

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you are not immediately replacing the Sun StorEdge PCI Dual Fibre Channel Host Adapter card, you need to perform a reconfiguration boot to reflect the new system configuration. For further information, see:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Install the Sun StorEdge PCI Dual Fibre Channel Host Adapter Card

For information about FC-AL host adapters, see your *Sun Fire V890 Server Owner's Guide*.

Note – Do not use the internal port of the Sun StorEdge PCI Dual Fibre Channel Host Adapter card to connect to the Loop A port of an FC-AL disk backplane. You must connect the card's internal port to Loop B only.

Note – If the internal port of your Sun StorEdge PCI Dual Fibre Channel Host Adapter card is connected to the Loop B port of an FC-AL disk backplane, *you must not use the card's external Port 1*. Connecting Port 1 to external devices under these circumstances is considered an unsupported configuration. In this case, use only Port 2 to connect to external devices.

Before You Begin

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

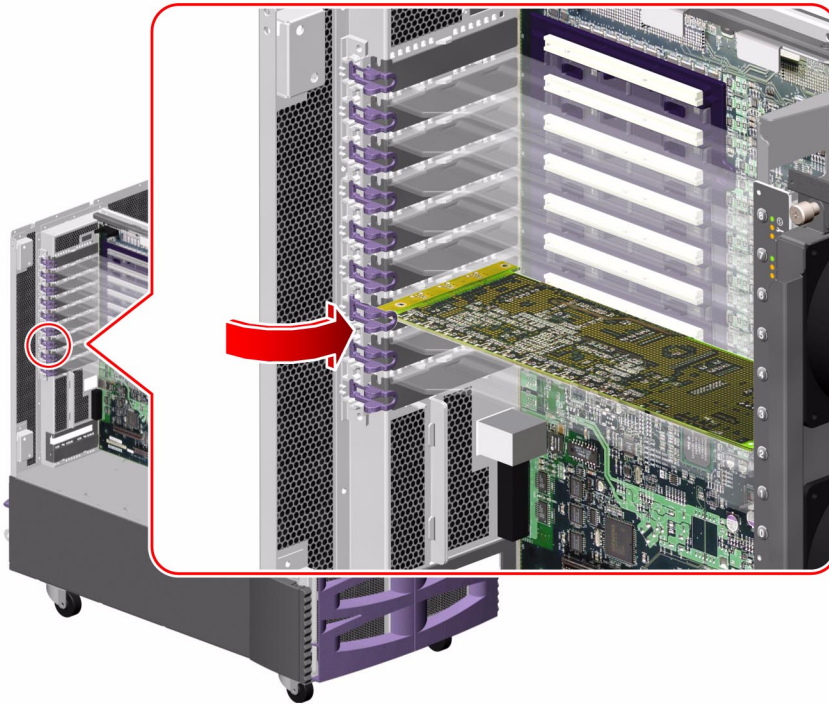
1. **Locate the PCI slot for the Sun StorEdge PCI Dual Fibre Channel Host Adapter card.**

Note – For optimal performance, install the Sun StorEdge PCI Dual Fibre Channel Host Adapter card into a 66-MHz PCI slot (slot 7 or 8) on the I/O board. The Sun StorEdge PCI Dual Fibre Channel Host Adapter card will function in a 33-MHz or 66-MHz PCI slot. For more information about PCI slots, see “About PCI Cards and Buses” on page 226.

2. **If a PCI filler panel is installed in the slot’s rear panel opening, remove it.**
 - a. **Pinch the PCI card retaining clip until it releases from the top of the filler panel and rotate the clip outward.**
 - b. **Slide the filler panel out from the rear panel.**
3. **Connect the Sun StorEdge PCI Dual Fibre Channel Host Adapter FC-AL cable to the card.**
 - a. **Connect the cable end labeled P3 to connector J3 on the card.**
 - b. **Connect the cable end labeled P4 to connector J4 on the card.**
4. **Insert the Sun StorEdge PCI Dual Fibre Channel Host Adapter card into its slot on the system I/O board.**
 - a. **Insert the faceplate end of the card into the appropriate opening in the rear panel.**
 - b. **Push the card into the connectors on the system I/O board.**

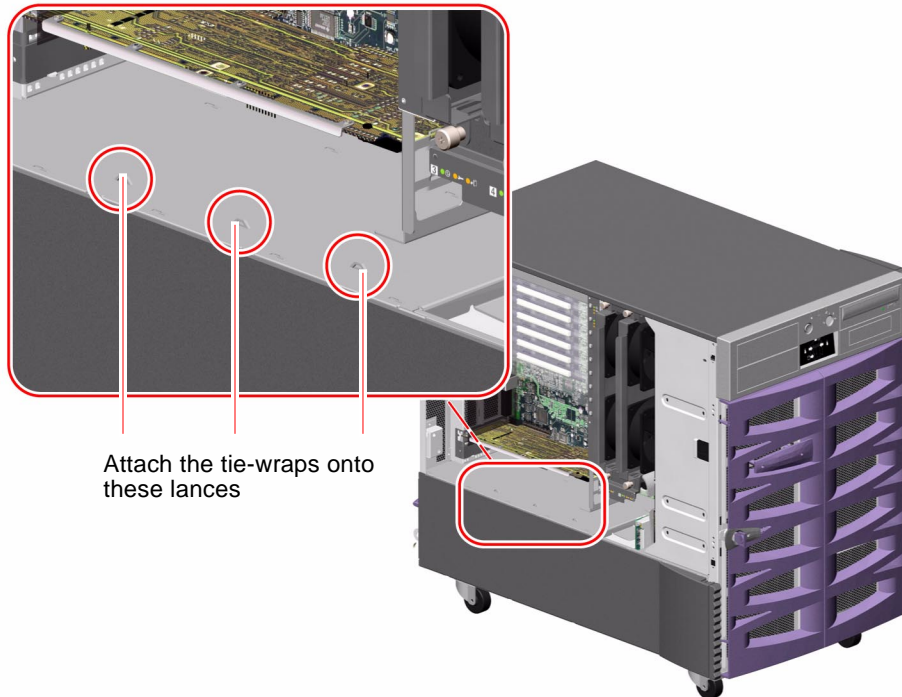
Apply even pressure along the edge of the card.

5. Rotate the PCI retaining clip over the back of the card faceplate until it snaps into place.



6. If you are installing the card for the first time, route and connect the Sun StorEdge PCI Dual Fibre Channel Host Adapter FC-AL cable in the system in the following manner:

- a. Attach the three tie-wraps provided with the Sun StorEdge PCI Dual Fibre Channel Host Adapter FC-AL cable onto the lances on the chassis power bay cover.



Attach the tie-wraps onto these lances

- b. Route the cable down to the chassis power bay cover and through the three tie-wraps.

Leave enough slack in the cable so that you can remove any other installed PCI cards during a PCI hot-plug procedure.

For cable connector locations, see “Cable Connector Locations” on page 212.

- c. Connect the cable end labeled D to connector D on the base FC-AL backplane.
- d. Connect the cable end labeled C to connector C on the base FC-AL backplane.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you installed this part as a new option, you need to perform a reconfiguration boot in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

How to Remove the PCI Internal LED Flex Circuit

Before You Begin

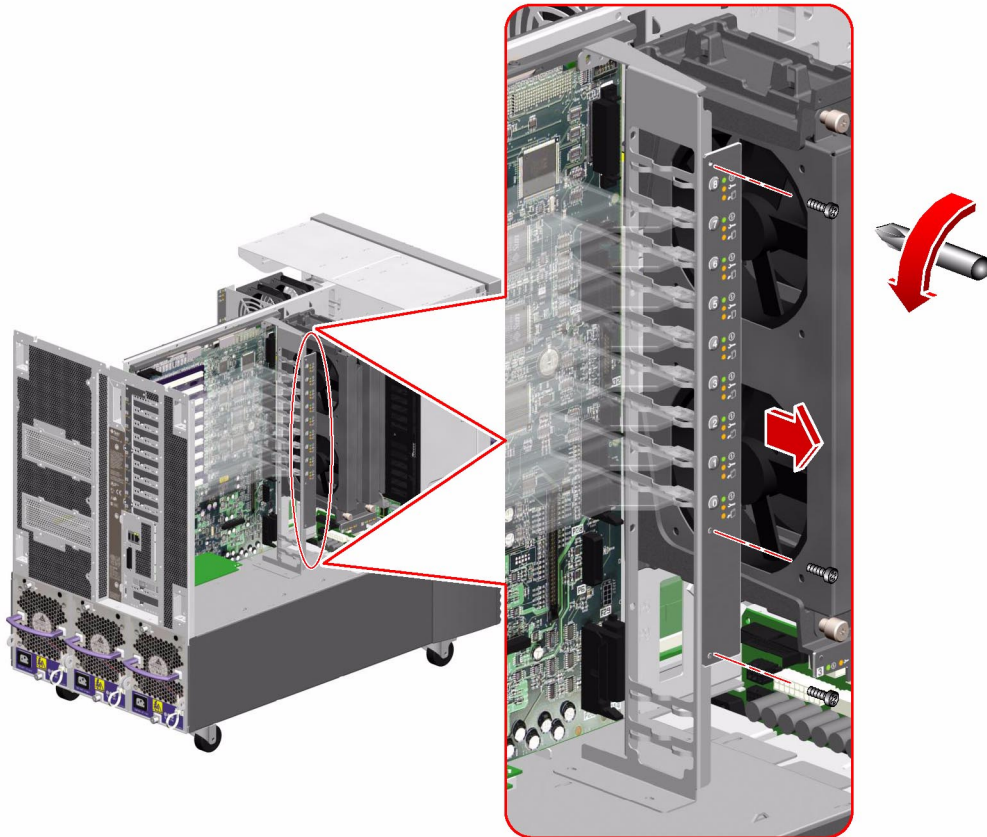
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Disconnect the PCI internal status cable (P37) from the back of the PCI internal LED flex circuit.**

2. Remove the three Phillips screws securing the flex circuit to the PCI card bracket and pull the flex circuit from the system.



3. Place the flex circuit on an antistatic mat.

What Next

To replace the PCI internal LED flex circuit, complete this task:

- “How to Install the PCI Internal LED Flex Circuit” on page 104

How to Install the PCI Internal LED Flex Circuit

Before You Begin

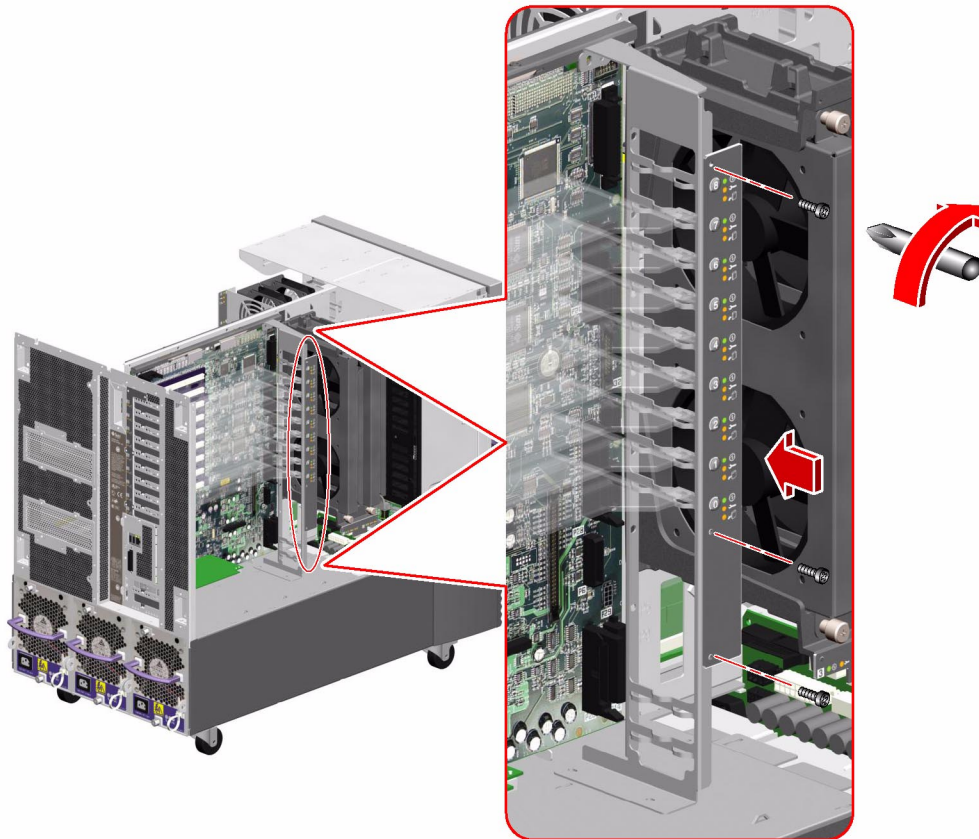
Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Align the PCI internal LED flex circuit with the PCI card bracket.**

2. Replace the three Phillips screws that secure the flex circuit to the bracket.



3. Connect the PCI internal status cable (P37) to the connector on the back of the flex circuit.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Remove the PCI External LED Flex Circuit

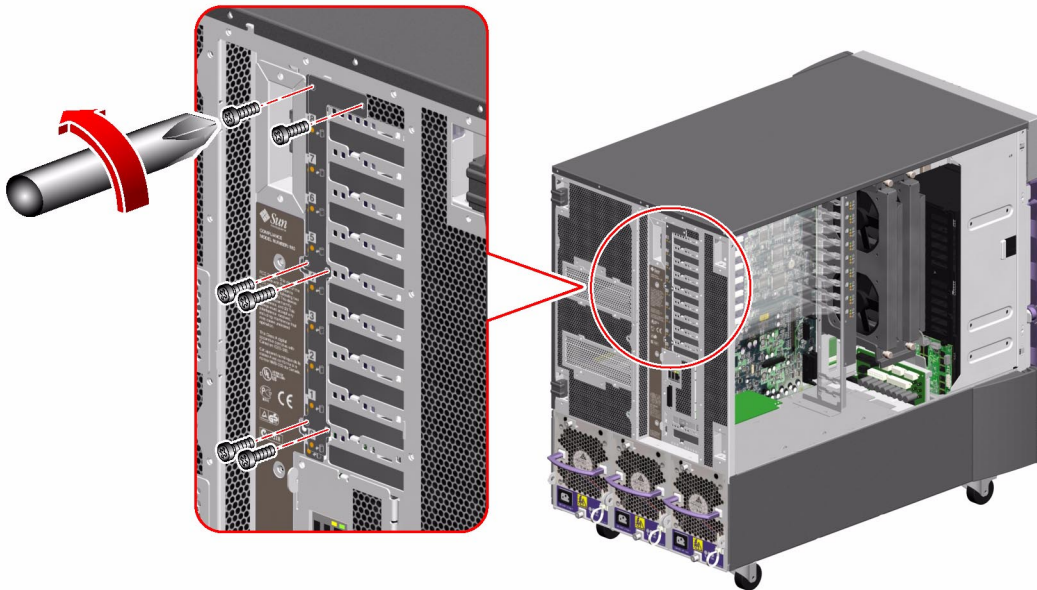
Before You Begin

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Disconnect the PCI external status cable (P24) from the back of the PCI external LED flex circuit.
2. Remove the six Phillips screws securing the flex circuit to the rear panel.



3. Remove the flex circuit from the rear panel.

4. Place the flex circuit on an antistatic mat.

What Next

To replace the PCI external LED flex circuit, complete this task:

- “How to Install the PCI External LED Flex Circuit” on page 107

How to Install the PCI External LED Flex Circuit

Before You Begin

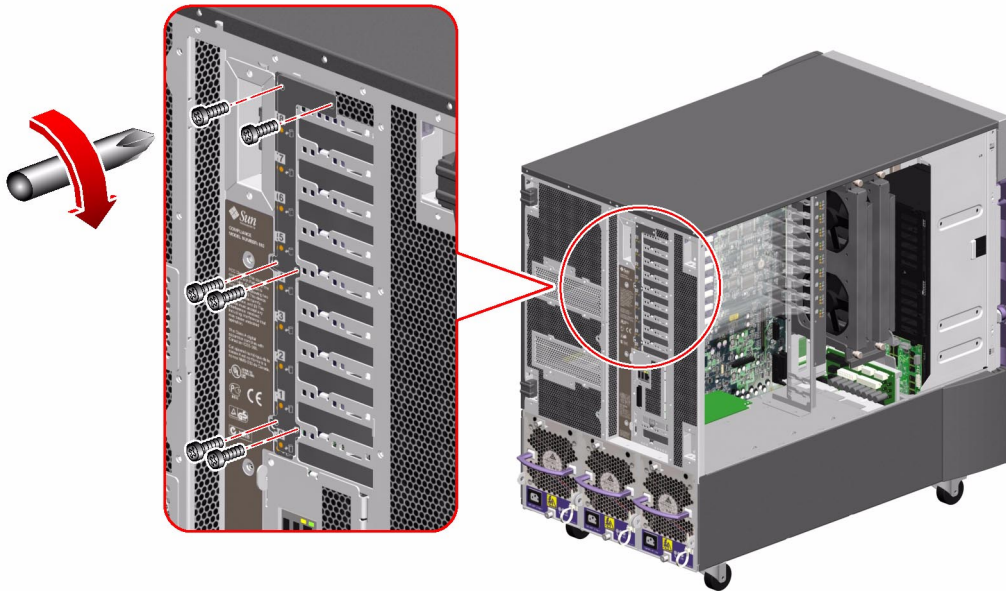
Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Position the PCI external LED flex circuit on the rear panel.

2. Replace the six Phillips screws that secure the flex circuit to the rear panel.



3. Connect the PCI external status cable (P24) to the connector on the back of the flex circuit.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Remove the I/O Fan LED Flex Circuit

Before You Begin

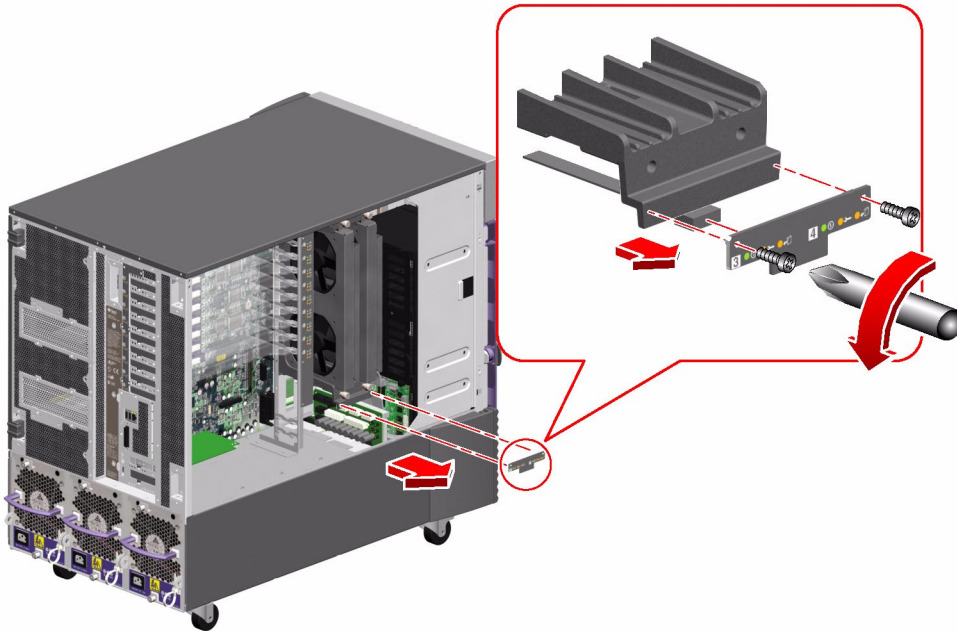
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Disconnect the I/O fan status cable (P27) from the back of the I/O fan LED flex circuit.**

2. Remove the two Phillips screws securing the flex circuit to the bottom I/O fan tray bracket.



3. Remove the flex circuit from the system.
4. Place the flex circuit on an antistatic mat.

What Next

To replace the I/O fan LED flex circuit, complete this task:

- "How to Install the I/O Fan LED Flex Circuit" on page 111

How to Install the I/O Fan LED Flex Circuit

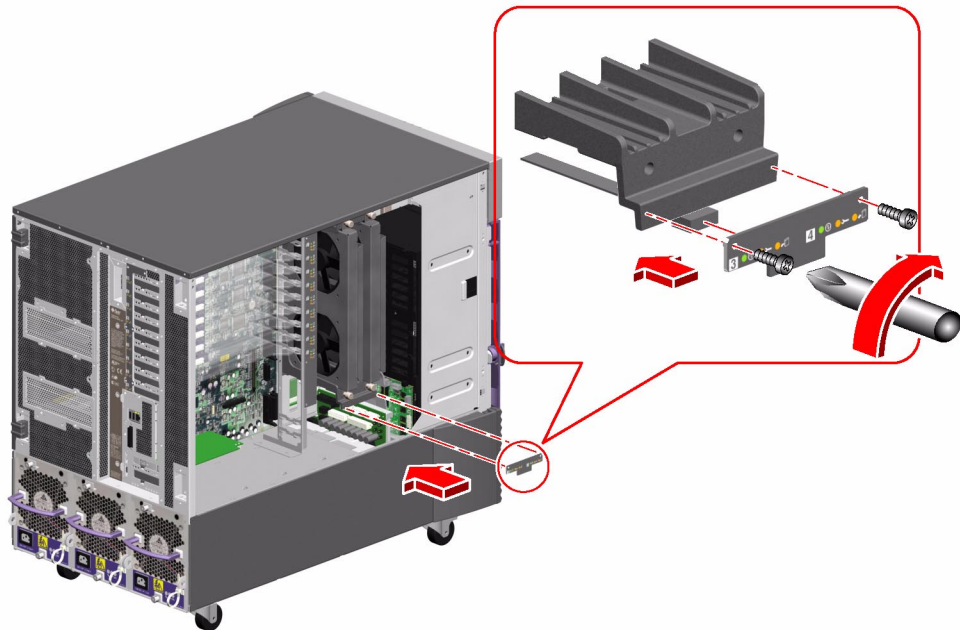
Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Position the I/O fan LED flex circuit on the bottom I/O fan tray bracket.
2. Replace the two Phillips screws that secure the flex circuit to the bracket.



3. Connect the I/O fan status cable (P27) to the connector on the back of the flex circuit.

What Next

To reassemble the system, complete this task:

- "How to Close a Side Door" on page 23
-

How to Remove the System ID PROM

This section explains how to remove a functioning ID PROM module so that you can install it on a new I/O board, thereby preserving the system's host ID information. If you are replacing a defective ID PROM module and want to retain the same host ID and Ethernet address, consult your authorized Sun sales representative or service provider for assistance with programming the new ID PROM with the existing host ID and Ethernet address.

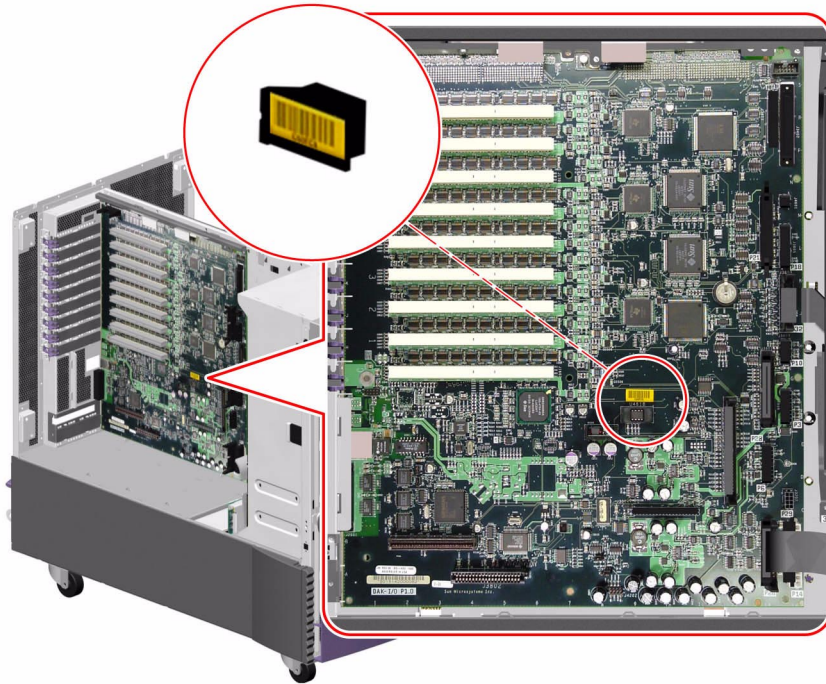
Before You Begin

Complete these tasks:

- "How to Power Off the System" on page 5
- "How to Open and Remove a Side Door" on page 21
- "How to Avoid Electrostatic Discharge" on page 26

What to Do

1. Locate the system ID PROM module on the I/O board.



2. Pull the ID PROM module from its socket.
3. Place the ID PROM module on an antistatic mat.

What Next

To replace the system ID PROM, complete this task:

- “How to Install the System ID PROM” on page 114

How to Install the System ID PROM

This section explains how to install a functioning ID PROM module. If you are replacing a defective ID PROM module and want to retain the same host ID and Ethernet address, consult your authorized Sun sales representative or service provider for assistance with programming the new ID PROM with the existing host ID and Ethernet address.

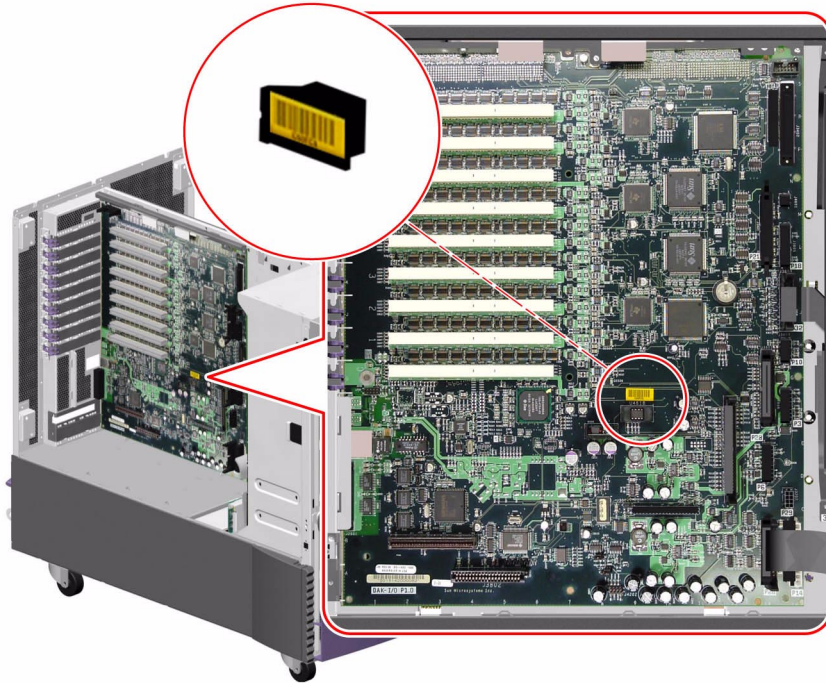
Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. **Carefully seat the system ID PROM module into its socket on the I/O board.**
The socket is keyed to ensure proper orientation of the ID PROM module.



2. **Press evenly and firmly until the ID PROM module is fully seated in the socket.**

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Remove the I/O Board



Caution – *The I/O board is not a hot-pluggable component. You must shut down the system and disconnect all the power cords from the system before performing this procedure.*

Before You Begin

You must remove the system controller card and all PCI cards from the I/O board. Note the slot number associated with each card so you can return each card to the appropriate slot when you reassemble the system.

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a PCI Card” on page 80
- “How to Remove the System Controller Card” on page 87
- “How to Remove an I/O Fan Tray” on page 76

What to Do

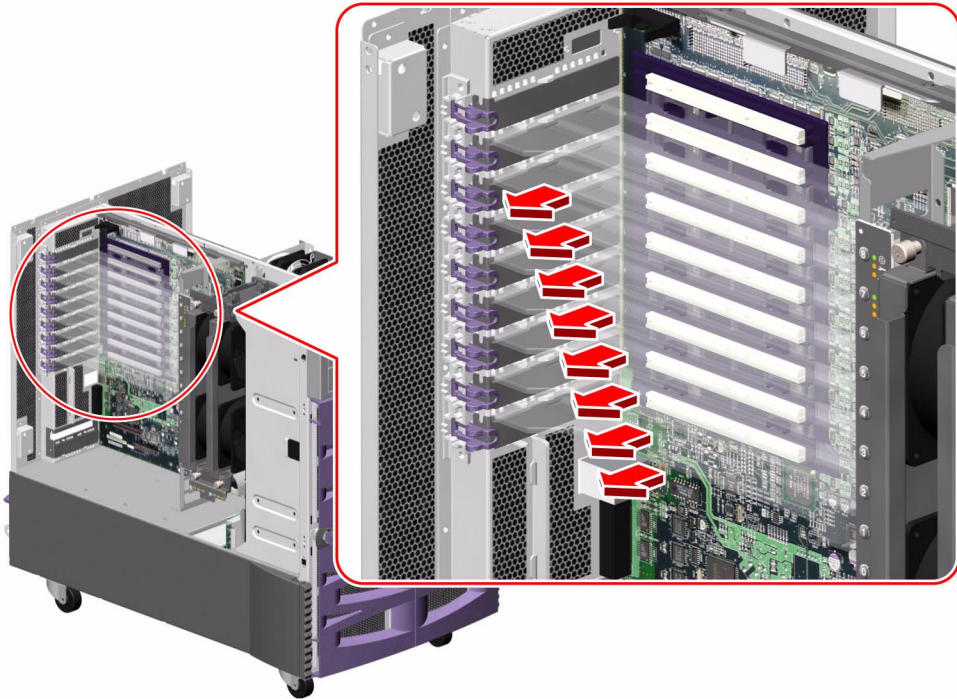


Caution – If you are using an antistatic wrist strap to protect against electrostatic discharge, connect it to a properly grounded surface, such as a nearby equipment rack, or a nearby system that is connected to a power source.

1. **Disconnect all AC power cords from the power supplies.**

2. Remove the eight PCI card dividers and set them aside.

Hold the divider by the front edge and pull it out from the divider base.



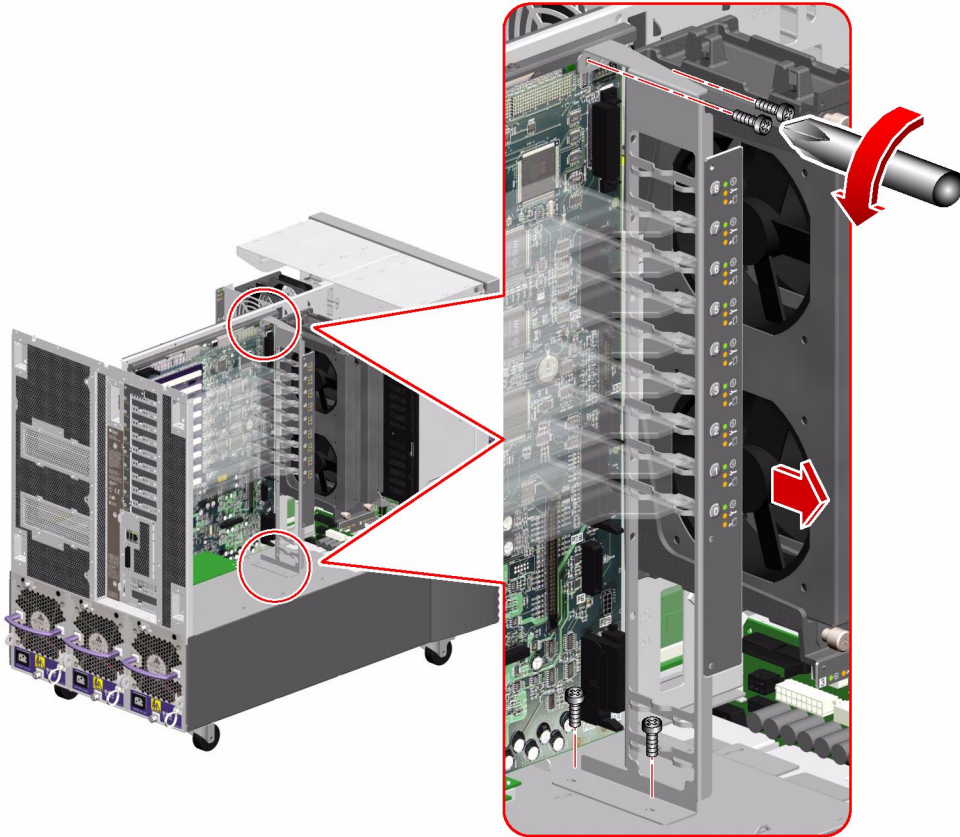
3. Remove the PCI card bracket.

- a. Disconnect the PCI internal status cable (P36) from the I/O board at connector J3102(P37).**

Keep the cable connected to the flex circuit.

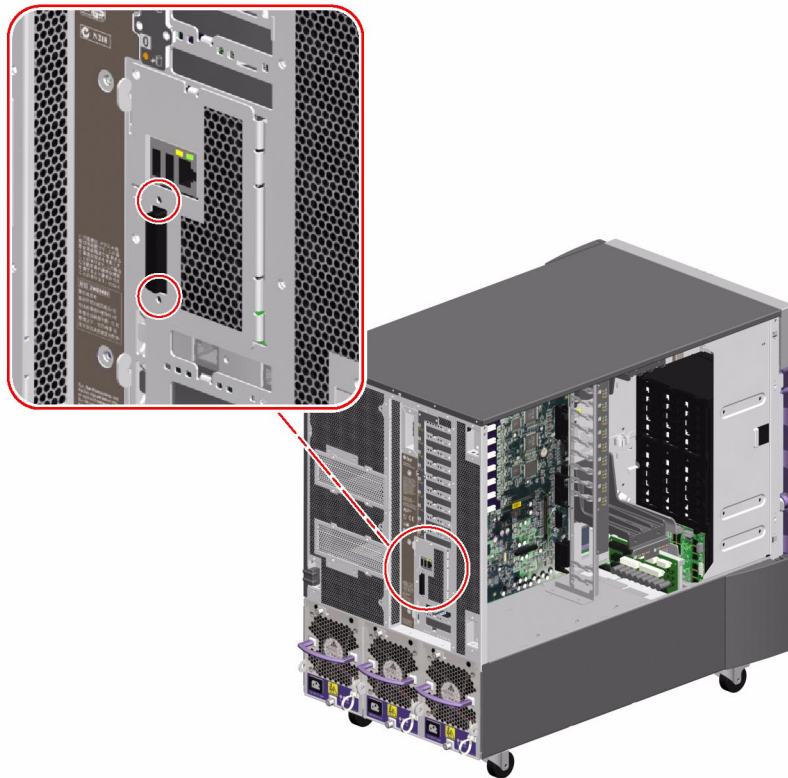
For cable connector locations, see “Cable Connector Locations” on page 212.

- b. Remove the four Phillips screws securing the PCI card bracket to the chassis and the I/O board stiffener.



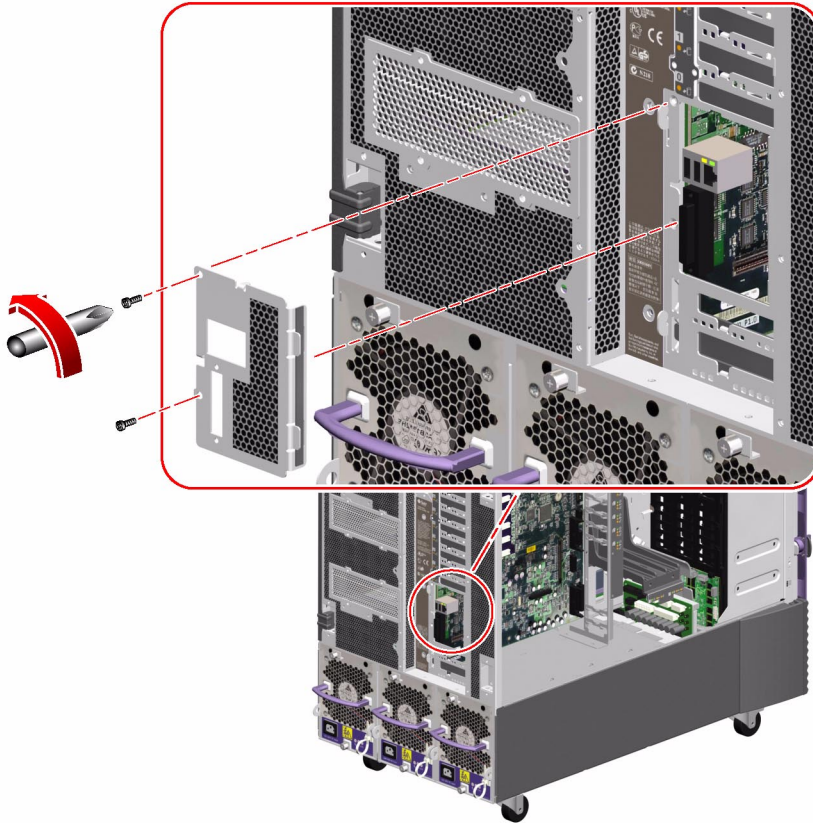
- c. Pull the PCI card bracket from the system.
 - d. Place the bracket on an antistatic mat.
4. Disconnect the following cables from the I/O board:
For cable connector locations, see “Cable Connector Locations” on page 212.
 - a. DVD-ROM cable (P1) from connector J3402(P1)
 - b. I²C cable (P18) from connector J3805(P18)
 - c. System status assembly cable (P32) from connector J3803(P32)

- d. Fan power cable from connectors J3804(P6), J3807(P10), and J3806(P3)
 - e. Fan status cable (P28) from connector J3801(P28)
 - f. I/O signal cable (P26) from connector J3201(P26)
 - g. I/O board remote sense cable (P29) from connector J3202(P29)
 - h. I/O board power cable (P14) from connector J3203(P14)
 - i. PCI external status cable (P23) from connector J3601(P23)
5. Remove the hex standoffs securing the serial port plate to the system rear panel.



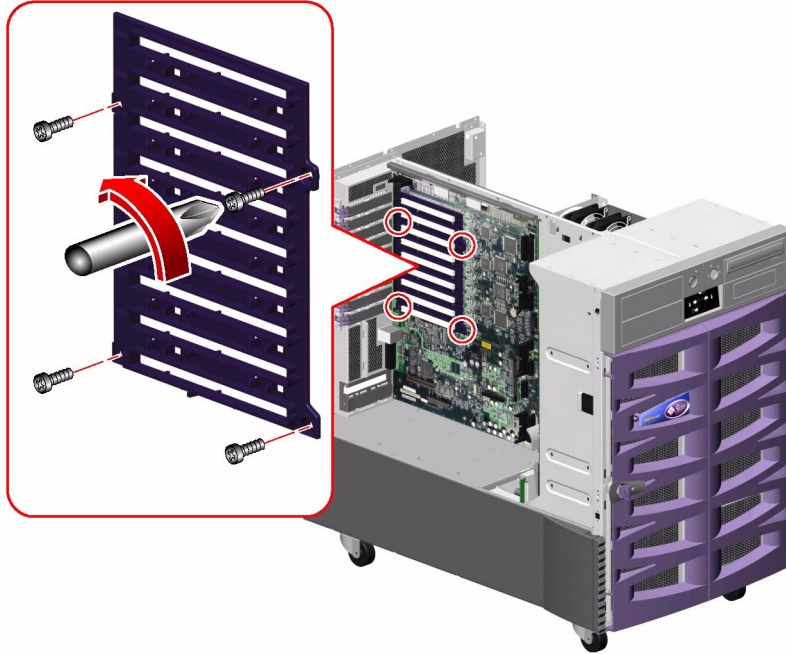
6. Remove the serial port plate from the rear panel.

Remove the two Phillips screws securing the plate in the system.



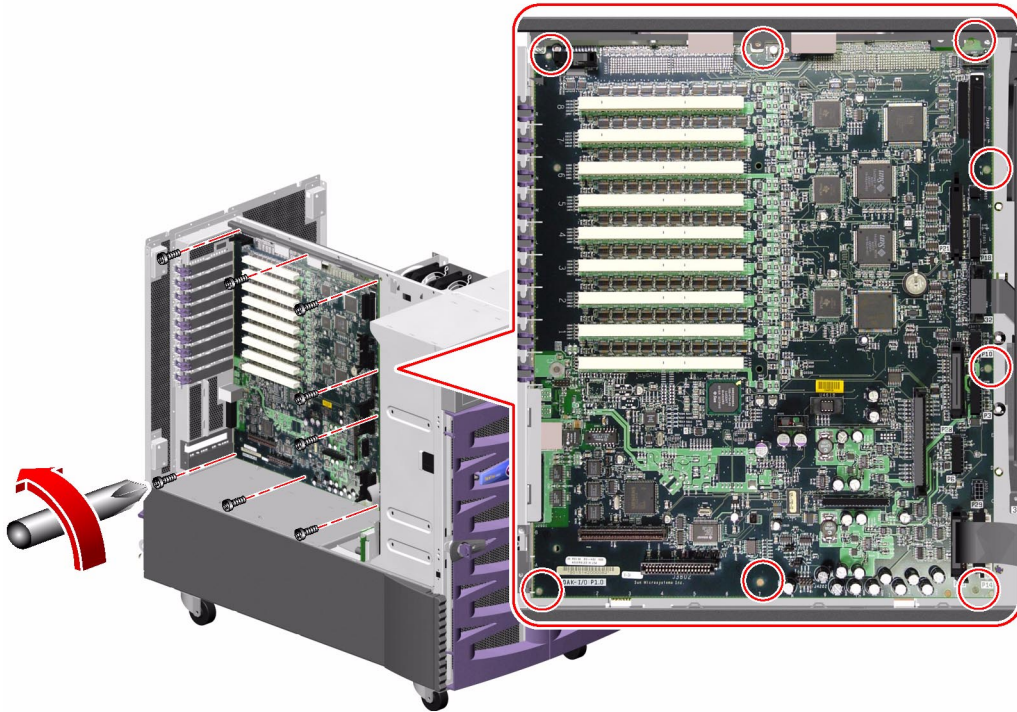
7. Remove the PCI divider card base.

- a. Remove the four Phillips screws securing the divider base to the centerplane.**



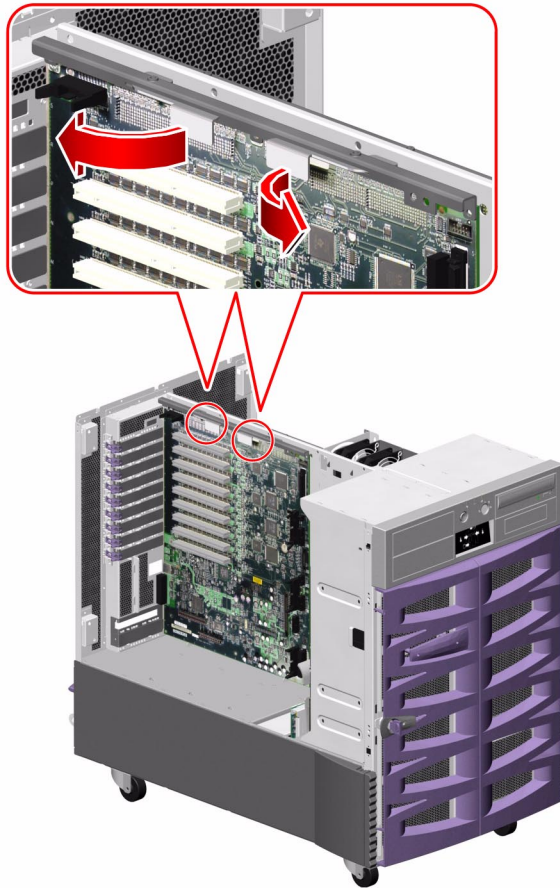
- b. Pull the divider base from the system and set it aside.**

8. Remove the remaining eight Phillips screws securing the I/O board to the system centerplane.



Caution – If the motherboard is not installed, hold the I/O board steady while removing the last few screws to prevent the I/O board from falling out of the system.

9. If the motherboard is installed, disengage the I/O board from the motherboard by rotating outward the two green ejection levers on the top of the I/O board.



10. Remove the I/O board from the system.
11. Place the I/O board on an antistatic mat.
12. If you are replacing the I/O board with a new one, remove the system ID PROM module from the old I/O board.
See "How to Remove the System ID PROM" on page 112.

What Next

To replace the I/O board, complete this task:

- “How to Install the I/O Board” on page 124

How to Install the I/O Board



Caution – *The I/O board is not a hot-pluggable component. You must shut down the system and disconnect all the power cords from the system before performing this procedure.*

Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do



Caution – If you are using an antistatic wrist strap to protect against electrostatic discharge, connect it to a properly grounded surface, such as a nearby equipment rack, or a nearby system that is connected to a power source.

1. **If you are replacing the system I/O board, transfer the system ID PROM module from the old I/O board to the new I/O board.**

See “How to Install the System ID PROM” on page 114.



Caution – Be sure that the I/O boards are on antistatic mats when you transfer the ID PROM.

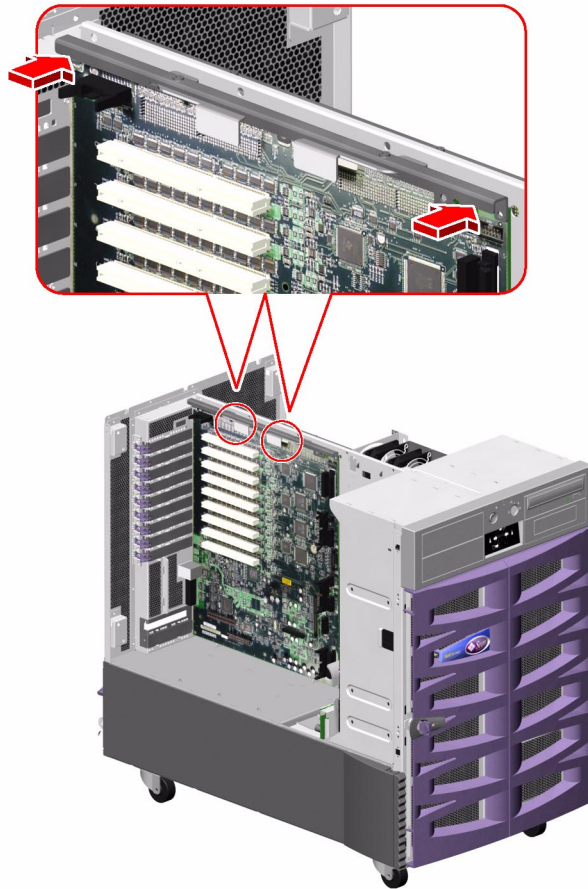
2. **Position the I/O board in the system against the centerplane.**

Use the pins on the back of the I/O board to align it in the system.

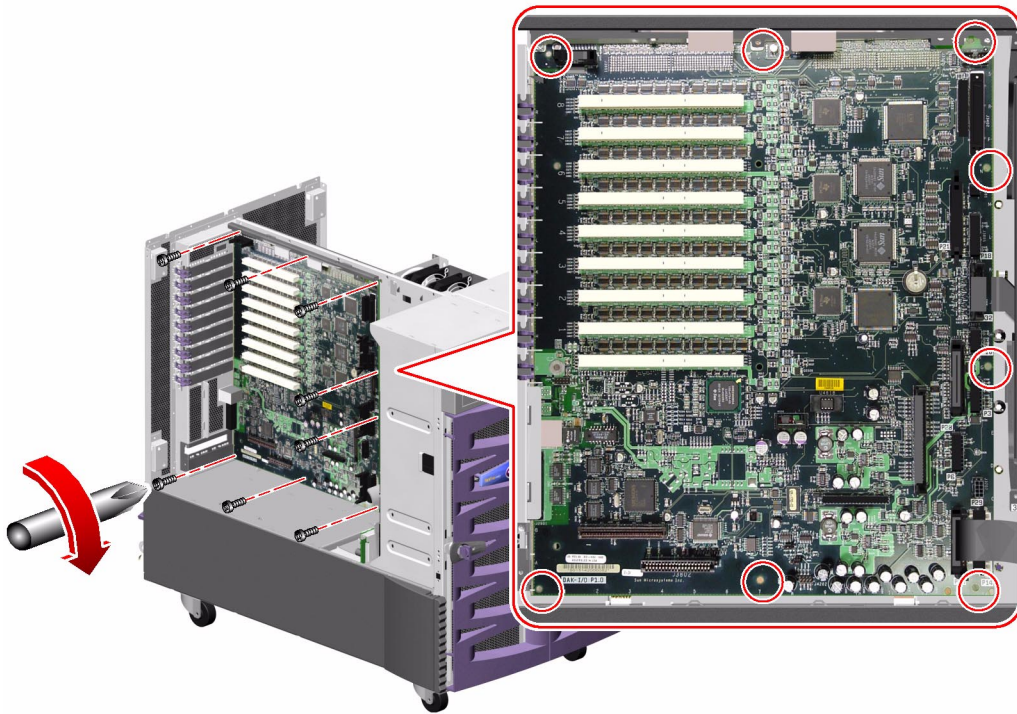
3. If the motherboard is in the system, connect the I/O board to the motherboard connectors by firmly pushing on the I/O board stiffener/ejection assembly.



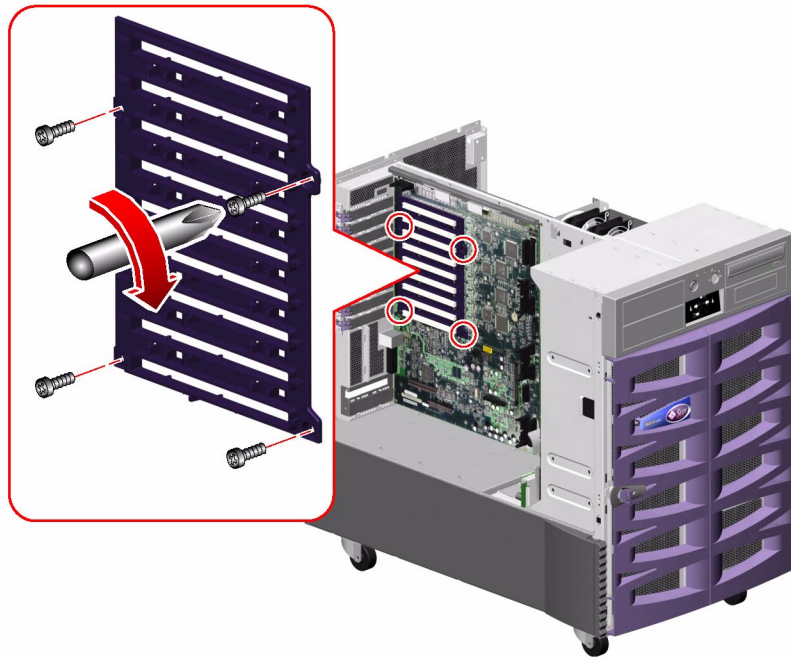
Caution – Do not push on the ejection levers to seat the I/O board in the system.



4. Replace the eight Phillips screws that secure the I/O board to the centerplane.
 - a. Insert the top center screw and tighten it by two turns.
 - b. Insert the screw directly beneath the top center screw and tighten it by two turns.
 - c. Insert the top left and right screws and tighten them by two turns.
 - d. Insert the remaining screws and tighten them by two turns.
 - e. Fully tighten the screws in the pattern described until the board is fully seated.

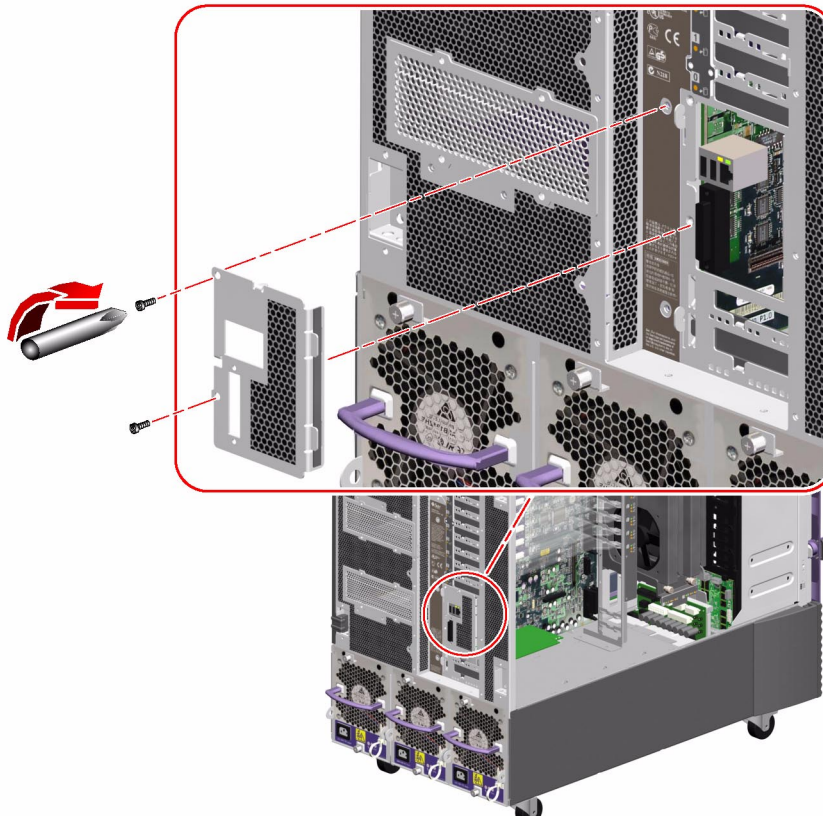


5. Secure the PCI card divider base to the I/O board with four Phillips screws.

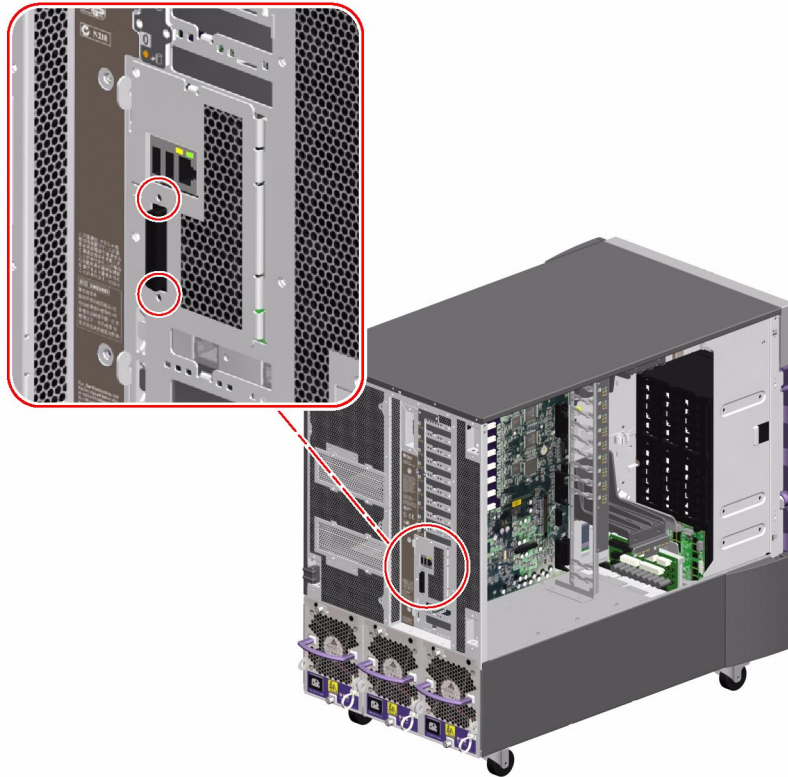


6. Replace the serial port plate on the system rear panel.

Replace the two Phillips screws that secure the plate to the rear panel.



7. Replace the hex standoffs that secure the serial port plate to the system rear panel.

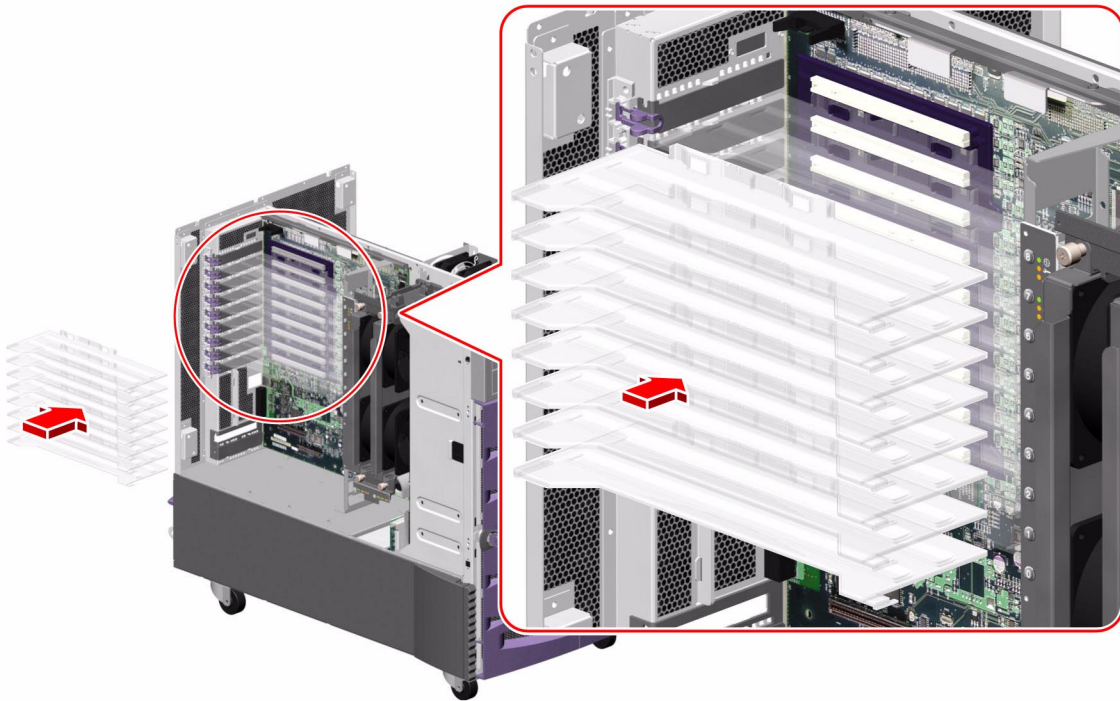


8. Reconnect the following cables to the I/O board:

For cable connector locations, see “Cable Connector Locations” on page 212.

- a. I/O board power cable (P14) to connector J3203(P14)
- b. I/O board remote sense cable (P29) to connector J3202(P29)
- c. I/O signal cable (P26) to connector J3201(P26)
- d. Fan status cable (P28) to connector J3801(P28)
- e. Fan power cable to connectors J3804(P6), J3807(P10), and J3806(P3)
- f. System status assembly cable (P32) to connector J3803(P32)
- g. I²C cable (P18) to connector J3805(P18)
- h. DVD-ROM cable (P1) to connector J3402(P1)

- i. PCI external status cable (P23) to connector J3601(P23)
9. Replace the PCI card bracket.
- a. Position the PCI card bracket in the system.
 - b. Replace the four Phillips screws that secure the PCI card bracket to the chassis and the I/O board stiffener.
 - c. Connect the PCI internal status cable (P36) to the I/O board at connector J3102(P37).
10. Replace the eight PCI card dividers from top to bottom.



- a. Carefully align the divider card with its tabs on the divider base.
Ensure that the back end of the divider is over the metal tab on the back of the system and that the plastic tab on the front of the divider is aligned with its slot on the PCI card bracket.
- b. Push the card firmly into the tabs on the divider base.

What Next

To reassemble the system, complete these tasks:

- “How to Install an I/O Fan Tray” on page 78
- “How to Install the System Controller Card” on page 91
- “How to Install a PCI Card” on page 83
- “How to Close a Side Door” on page 23

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

Removing and Installing Storage Devices

This chapter describes how to remove and install storage devices. For a list of part numbers for field-replaceable units (FRUs) and optional equipment, see “Illustrated Parts Breakdown” on page 249.

The following tasks are covered in this chapter:

- “How to Remove a Disk Drive” on page 133
- “How to Install a Disk Drive” on page 136
- “How to Remove the DVD-ROM Drive” on page 138
- “How to Install the DVD-ROM Drive” on page 141
- “How to Remove a Tape Drive” on page 144
- “How to Install a Tape Drive” on page 148

How to Remove a Disk Drive

Before You Begin

The system’s disk drive hot-plug feature lets you remove a disk drive without shutting down the operating system or turning off the system power. For more information about disk drives, see the *Sun Fire V890 Server Owner’s Guide*. For more information about hot-plugging, see:

- “About Hot-Pluggable and Hot-Swappable Components” on page 6

Note – PCI and disk hot-plug operations are not supported when the system ok prompt is displayed. You can only perform these hot-plug operations while the operating system is running.

Note – If you are removing multiple drives from a system to perform a service procedure that requires removing all the disks from the system, label each drive according to the slot from which it was removed so that you can return the disk to its appropriate slot when you reassemble the system.

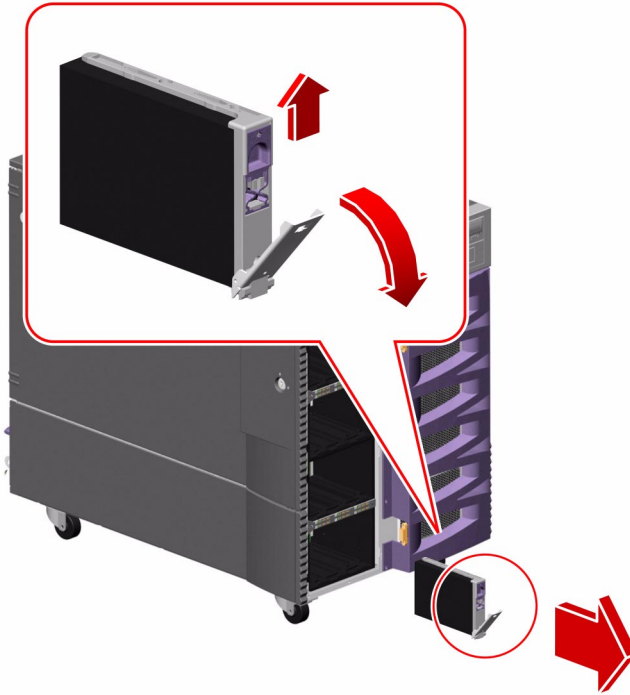
Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

Note – You need a system console in order to perform disk hot-plug operations. For more information, see “About Setting Up a Console” on page 16.

What to Do

1. **Unlock and open the front door.**
2. **Identify the disk drive to be removed.**
For information about disk status LEDs, see “About Disk Drive LEDs” on page 269.
3. **If you are performing a hot-plug operation, prepare the system for disk removal.**
The hot-plug removal procedure involves software commands for preparing the system prior to removing the disk drive. See “About Hot-Pluggable and Hot-Swappable Components” on page 6.
4. **If you are not performing a hot-plug operation, halt the operating system and power off the system.**
See “How to Power Off the System” on page 5.
5. **Attach an antistatic wrist strap to a metal surface inside the system chassis.**
6. **Using your thumb and forefinger, push the drive latch upward to release the drive handle.**
Swing the handle away from the drive until you feel the drive connector disengage from the backplane. Do not use excessive force.



Caution – If you are hot-plugging the disk drive, after disconnecting it from the backplane, allow 30 seconds or so for the drive to spin down completely before removing it from the system.

7. Holding the drive by the handle, carefully slide it out of the drive bay.
8. Place the drive on an antistatic mat.
9. If you are performing a hot-plug operation, complete the software part of the removal procedure.
See “About Hot-Pluggable and Hot-Swappable Components” on page 6.

What Next

To reassemble the system, complete this task:

- “How to Install a Disk Drive” on page 136

How to Install a Disk Drive

Before You Begin

The system's disk drive hot-plug feature lets you install a disk drive without shutting down the operating system or turning off the system power. For more information about disk drives, see the *Sun Fire V890 Server Owner's Guide*. For more information about hot-plugging, see:

- "About Hot-Pluggable and Hot-Swappable Components" on page 6

Note – PCI and disk hot-plug operations are not supported when the system `ok` prompt is displayed. You can only perform these hot-plug operations while the operating system is running.

Complete this task:

- "How to Avoid Electrostatic Discharge" on page 26

Note – You need a system console in order to perform disk hot-plug operations. For additional details, see "About Setting Up a Console" on page 16.

What to Do

1. **If you are performing a hot-plug operation, prepare the system to receive the new disk drive.**

The hot-plug installation procedure involves software commands for preparing the system prior to installing the disk drive. See "About Hot-Pluggable and Hot-Swappable Components" on page 6.

2. **If you are not performing a hot-plug operation, halt the operating system and power off the system.**

See "How to Power Off the System" on page 5.

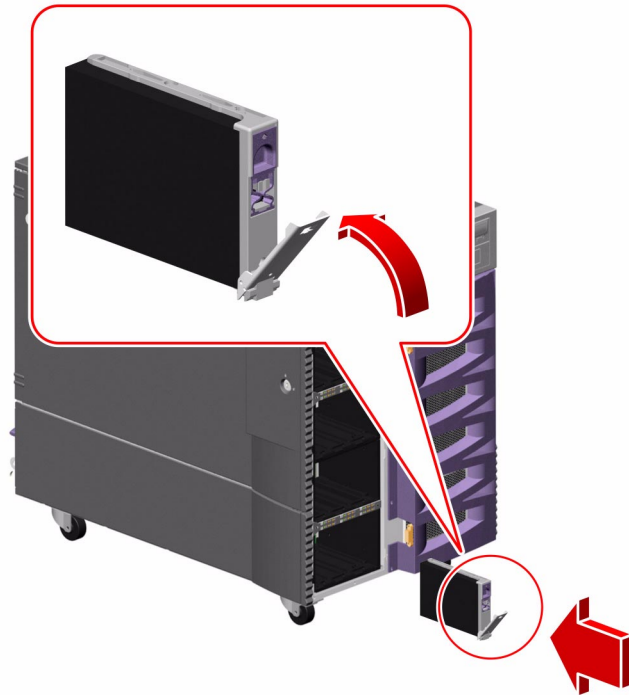
3. **Unlock and open the front door, if it is not open already.**
4. **Attach the antistatic wrist strap to a metal surface inside the system chassis.**

5. Release the drive handle on the disk drive to be installed.

Use your thumb and forefinger to pinch the drive latch upward to open it.

6. Align the disk drive with its drive bay.

Orient the drive so that the drive handle's hinge faces the bottom of the drive bay.



- 7. Holding the drive by its handle, fit the drive into the guide rails at the top and bottom of the drive bay.**
- 8. Slide the drive into the bay until it barely contacts the backplane.**
- 9. Press carefully on the center of the drive and watch as the handle begins to close.**
The drive handle begins to close as the drive engages its backplane connector.
- 10. Press the handle toward the drive until the latch closes, securing the drive in place.**
- 11. Close the front door and lock it, if necessary.**

12. If you are performing a hot-plug installation, complete the software part of the installation procedure.

See “About Hot-Pluggable and Hot-Swappable Components” on page 6.

Note – If you are installing more than one disk drive as part of a hot-plug procedure, make sure that the Activity LED on the drive you just installed is lit steadily (that is, not flashing) before installing another disk drive. For more information about disk drive LEDs, see “About Disk Drive LEDs” on page 269.

What Next

If you installed this part as a new option while the system was powered off, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Remove the DVD-ROM Drive

Before You Begin

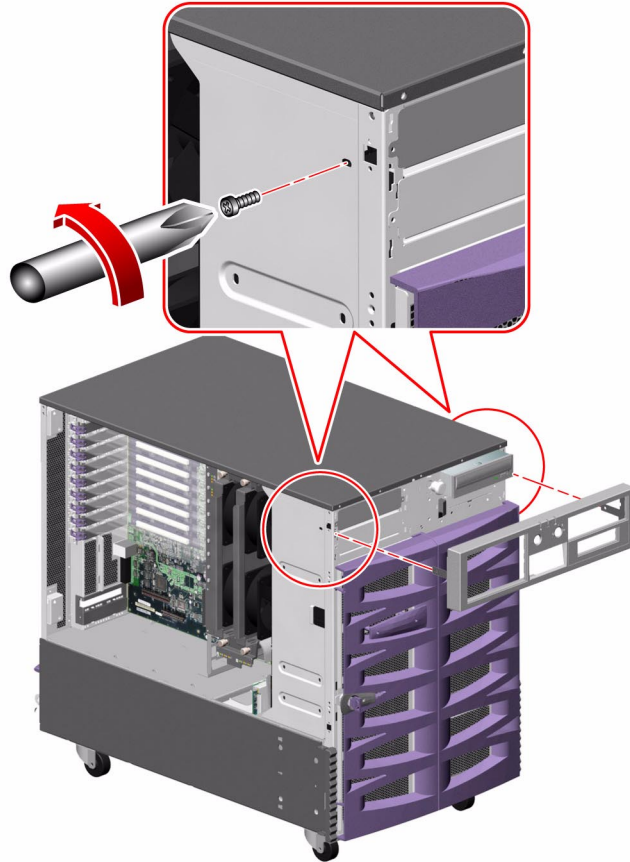
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

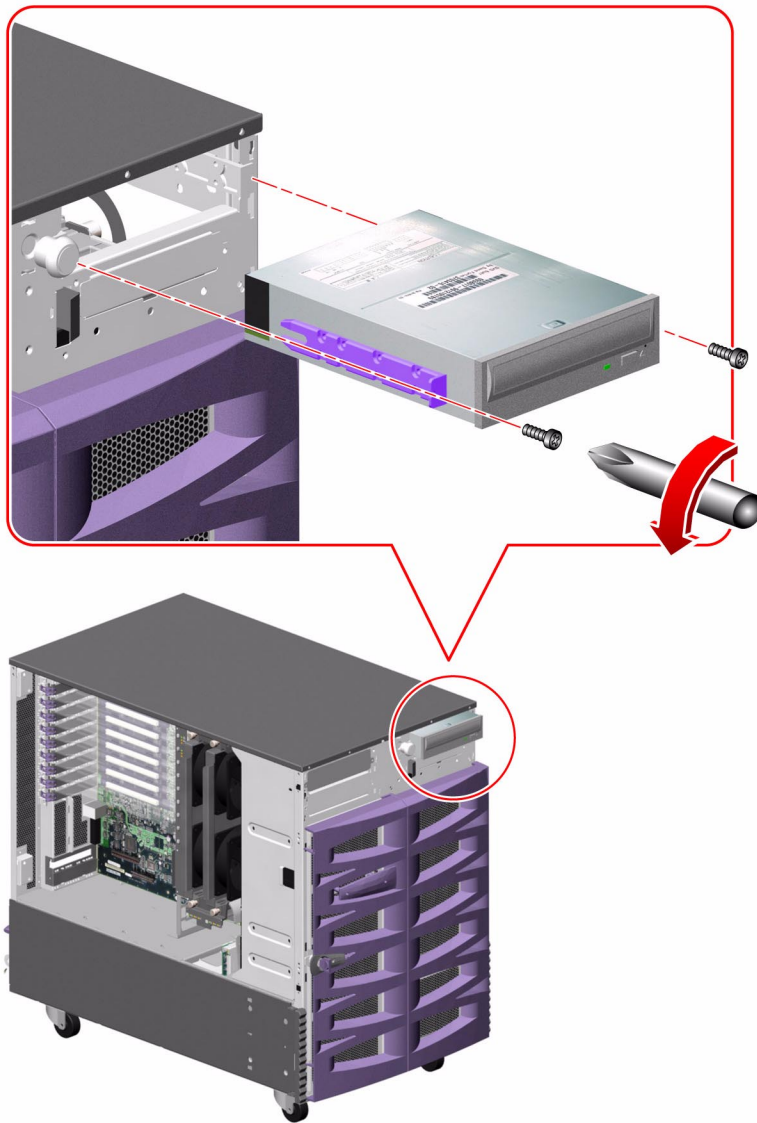
1. Remove the removable media bezel from the front of the system.

Remove the two Phillips screws securing the bezel to the front of the system.



2. Remove the cables connected to the back of the DVD-ROM drive.

3. Remove the two Phillips screws securing the DVD-ROM drive to the chassis.



4. Pull the DVD-ROM drive from the system.

The DVD-ROM drive slides out on guides located on its sides.

What Next

To replace the DVD-ROM drive, complete this task:

- “How to Install the DVD-ROM Drive” on page 141

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you are not replacing this part right away, you need to perform a reconfiguration boot in order for the operating system to recognize the configuration change. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Install the DVD-ROM Drive

Before You Begin

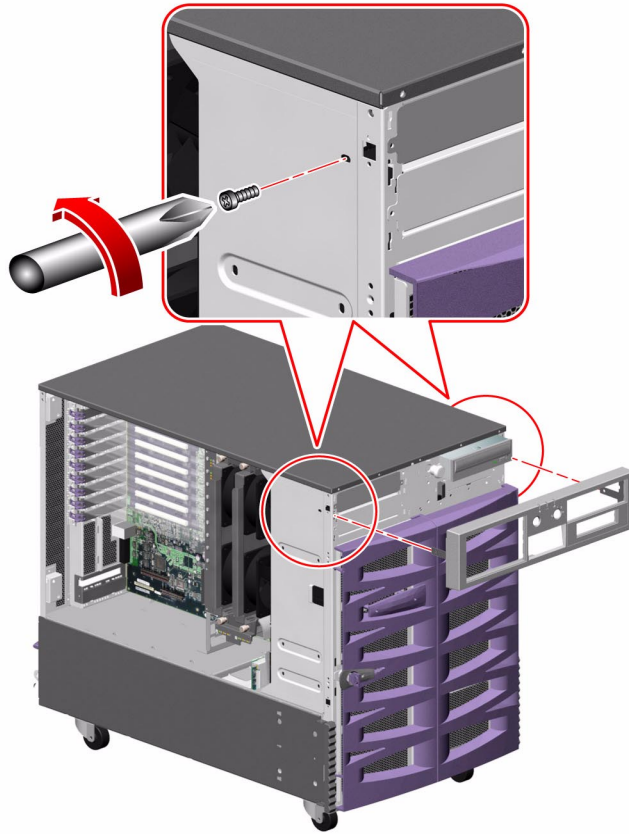
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Remove the removable media bezel from the front of the system.

Remove the two Phillips screws securing the bezel to the front of the system.



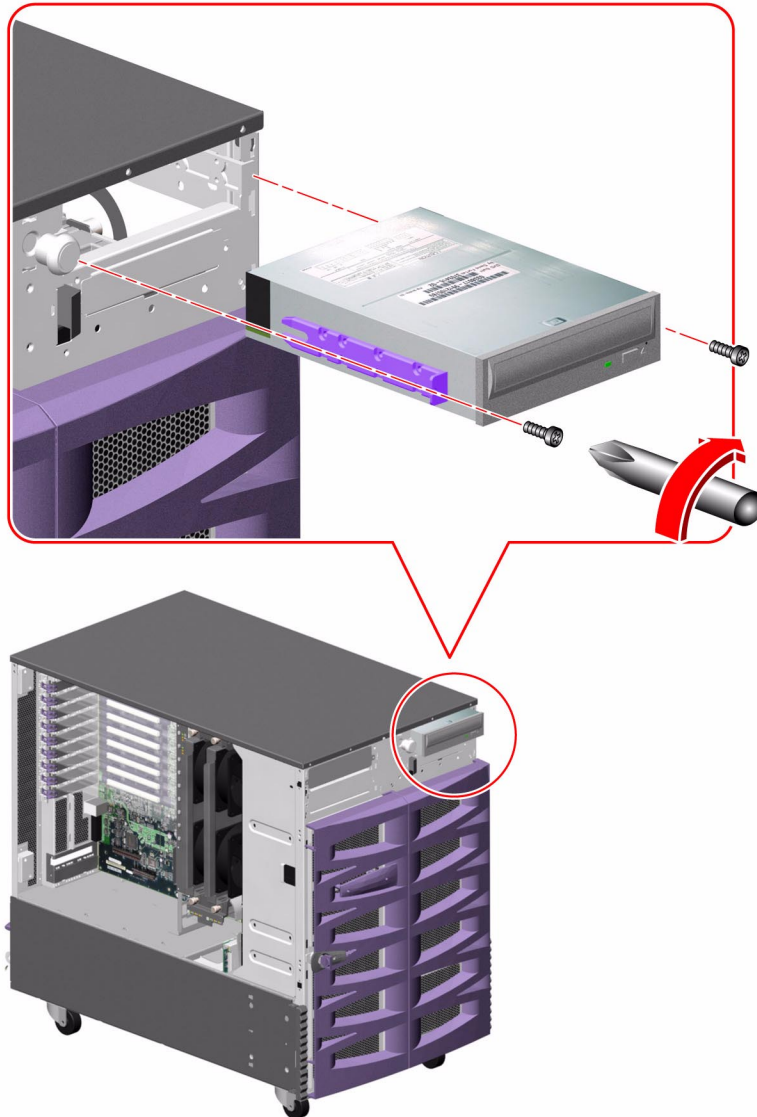
2. Install the plastic guide rails onto the DVD-ROM drive.

If you are replacing a faulty DVD-ROM drive, transfer the guide rails to the new drive.

3. Align the DVD-ROM drive with the guides in the DVD-ROM drive slot.

4. Slide the drive into the slot.

5. Insert and tighten the two Phillips screws that secure the DVD-ROM drive to the chassis.



6. Connect the DVD-ROM drive cables to the back of the device.

7. Replace the removable media bezel.

Replace the two Phillips screws that secure the bezel to the system chassis.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

How to Remove a Tape Drive

Before You Begin

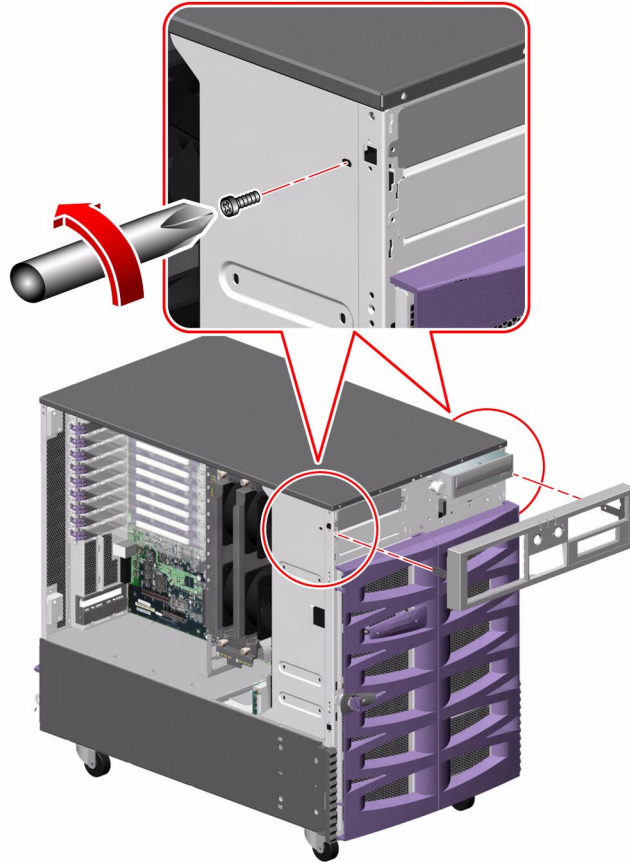
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

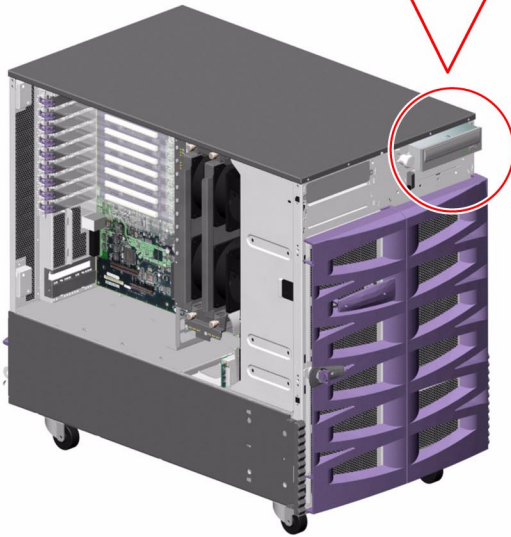
1. Remove the removable media bezel from the front of the system.

Remove the two Phillips screws securing the bezel to the front of the system.



2. Remove the cables connected to the back of the device.

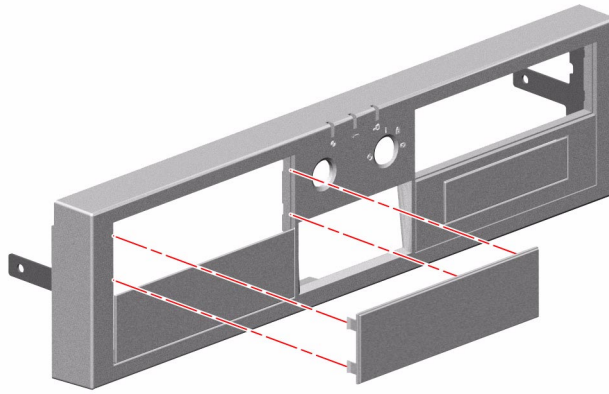
3. Remove the two Phillips screws securing the device to the chassis.



4. Pull the device from the system.

The device slides out on guides located on its sides.

5. If you are not immediately replacing the device, complete the following steps:
 - a. Install a metal filler panel into the device's slot.
 - b. Replace the removable media bezel.
Replace the two Phillips screws that secure the bezel to the system chassis.
 - c. Install a plastic filler panel into the device's slot in the removable media bezel.



What Next

To replace a tape drive, complete this task:

- “How to Install a Tape Drive” on page 148

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you are not replacing this part right away, you need to perform a reconfiguration boot in order for the operating system to recognize the configuration change. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Install a Tape Drive

Before You Begin

The Sun Fire V890 server does not come with a tape drive. If you are installing a SCSI tape drive for the first time, you must order and install the following components:

- SCSI tape drive
- SCSI host adapter card (Sun part number X6758A)
- Ultra Wide SCSI data cable (Sun part number 530-3302)

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

To install the SCSI host adapter card, complete this task:

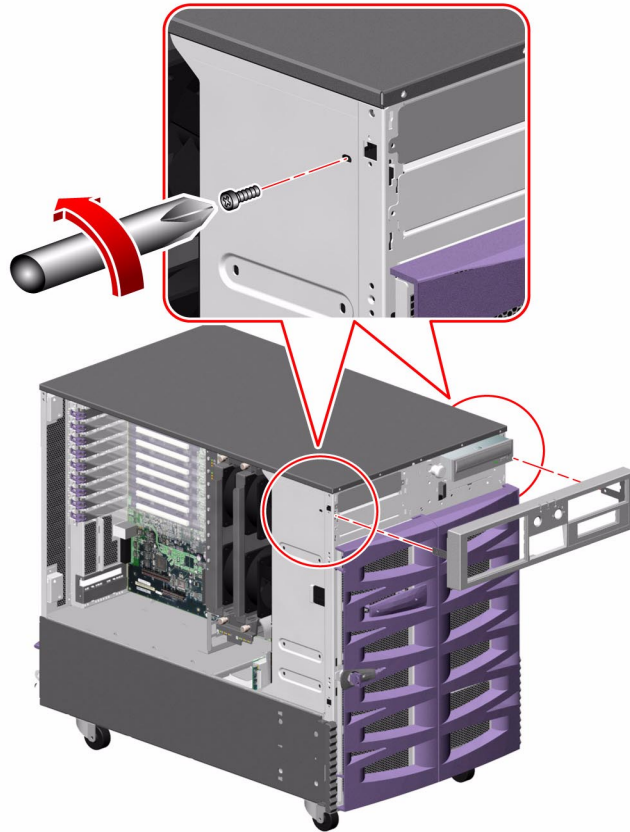
- “How to Install a PCI Card” on page 83

Note – The SCSI host adapter card must be installed in PCI slot 0.

What to Do

1. Remove the removable media bezel from the front of the system.

Remove the two Phillips screws securing the bezel to the front of the system.



2. If there is a metal filler panel in the slot, remove it.

Using a flathead screwdriver, carefully pry the metal filler panel from the slot.

3. If you are installing a full-height device into the left-side bay, remove the divider shelf from the bay.

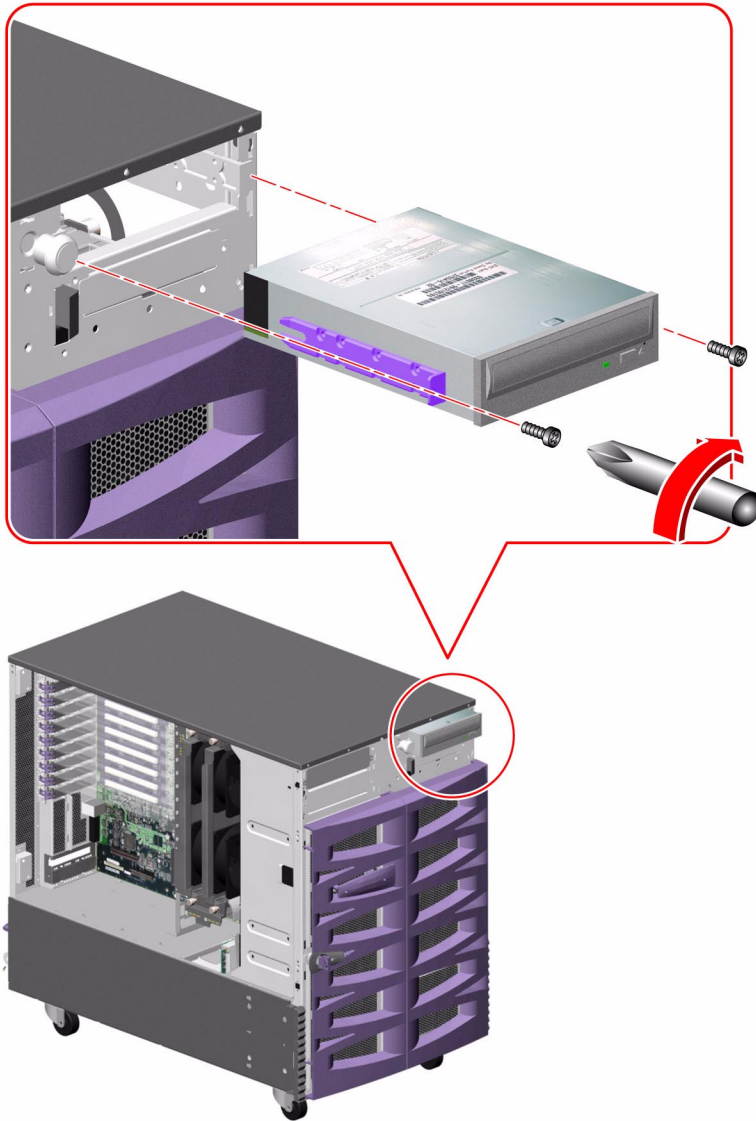
4. Install the plastic guide rails onto the device.

If you are replacing a faulty device, transfer the guide rails to the new device. If you are installing a device for the first time, the guide rails and screws are shipped in the accessory kit that is shipped with your system.

5. Align the device with the guides in the empty slot.

6. Slide the device into the slot.

7. Insert and tighten the two Phillips screws that secure the device to the system.



8. **Connect the appropriate plug (P2 or P3) of the Ultra Wide SCSI data cable (Sun part number 530-3302) to the back of the tape drive.**

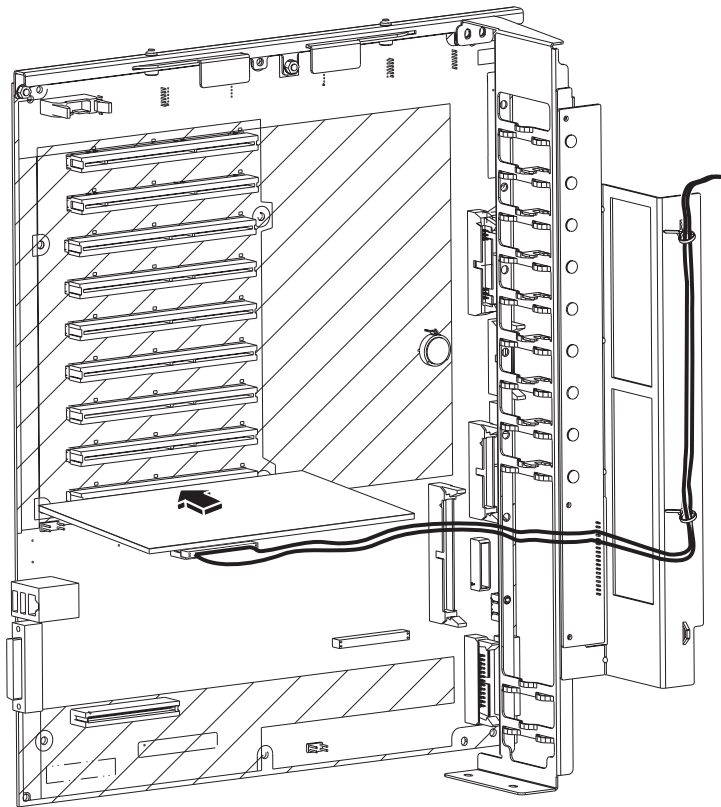
For proper plug connections, see “Cable Routing” on page 215.

9. **Route the SCSI data cable and connect the cable to the SCSI adapter card (Sun part number X6758A).**

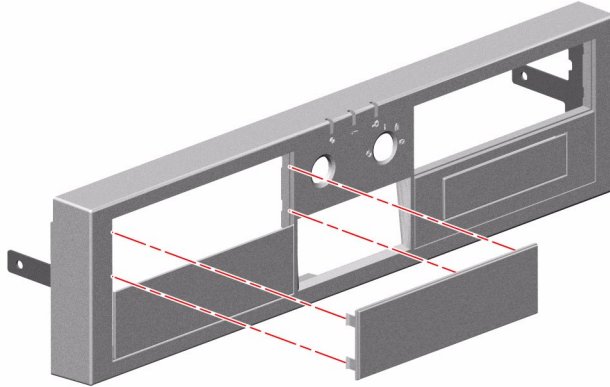
Route the cable over the I/O fan tray brackets and down the PCI fan block bracket to the middle routing lance. Use tie wraps to secure the cable to the PCI fan block bracket.

Note – Because of the size of the SCSI connector, the SCSI host adapter card must be installed in PCI slot 0.

10. **Connect plug P1 of the cable to the 68-pin SCSI connector on the SCSI host adapter card.**



11. If you are installing a device into an empty slot, remove that slot's plastic filler panel from the removable media bezel.



12. **Replace the removable media bezel.**

Replace the two Phillips screws that secure the bezel to the system chassis.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you installed this part as a new option, you need to perform a reconfiguration boot in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

Removing and Installing Miscellaneous Assemblies

This chapter describes how to remove and install miscellaneous assemblies in the system. For a list of part numbers for field-replaceable units (FRUs) and optional equipment, see “Illustrated Parts Breakdown” on page 249.

The following tasks are covered in this chapter:

- “How to Remove a Power Supply” on page 155
- “How to Install a Power Supply” on page 160
- “How to Remove the System Status Assembly” on page 163
- “How to Install the System Status Assembly” on page 166

How to Remove a Power Supply



Caution – A power supply must always occupy each power supply bay. If a power supply fails, you must leave the failed power supply in its bay until you are able to install a functioning replacement power supply. A failed power supply still acts as an air baffle channeling airflow to cool the bottom row of disk drives in the disk cage. Replace the failed power supply as soon as possible to regain N+1 power redundancy.

Note – During a hot-swap operation, after you remove a fan tray or power supply, wait for an acknowledgement message on the system console before installing a replacement part; otherwise, the environmental monitoring software will not recognize the new device and false error conditions will result.

Note – Use only Sun Fire V890 200-240 VAC power supplies in the Sun Fire V890 system.

Before You Begin

It is not necessary to power off the system if you are removing a redundant power supply. For more information about power supplies, see:

- “About Power Supplies” on page 232
- “About Hot-Pluggable and Hot-Swappable Components” on page 6

Note – Unlike hot-pluggable devices, you can install or remove a power supply or fan tray while the system is operating at the `ok` prompt. However, in the case of the power supply, you must issue a `reset-all` command at the `ok` prompt in order for the system to recognize the change the next time the operating system is booted.

If you are not performing a hot-plug procedure, complete this task:

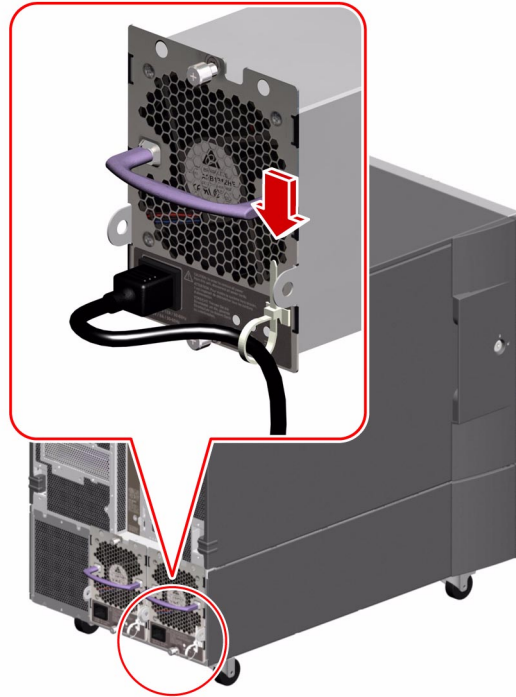
- “How to Power On the System” on page 2

What to Do

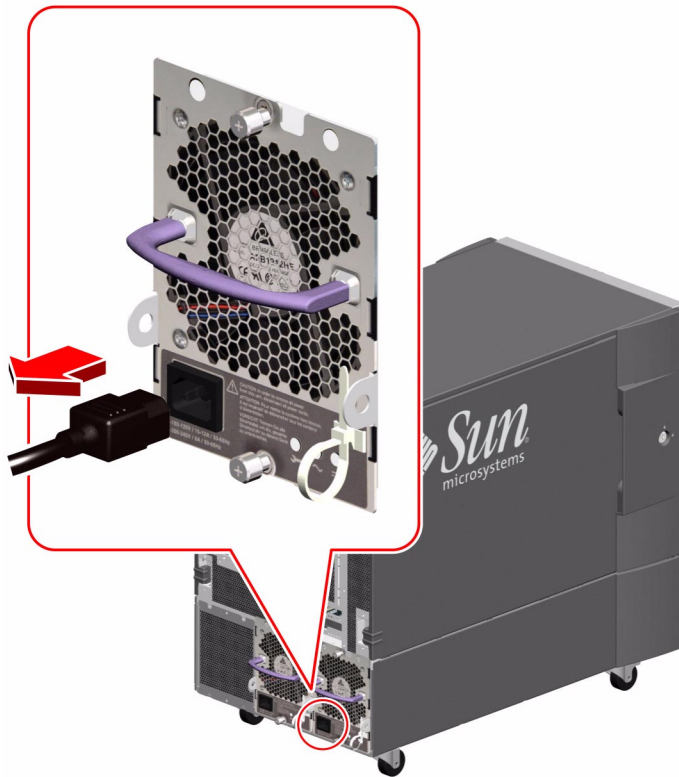
1. Identify the power supply that you want to remove.

For information about LEDs, see “About Power Supply LEDs” on page 267.

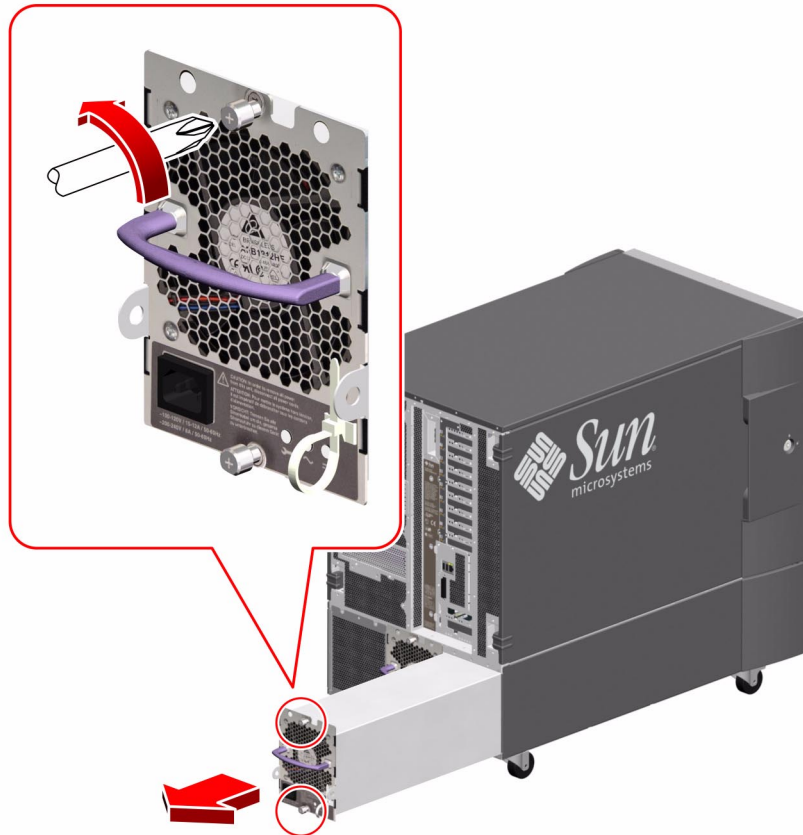
2. Release the AC power cord from the strain-relief tie-wrap on the power supply.
Press the tab on the head of the tie-wrap to release it.



3. Unplug the AC power cord from the power supply and the AC power outlet.



4. Loosen the two captive Phillips screws securing the power supply to the system rear panel.



5. Pull the power supply out from its bay.

Use one hand to pull the power supply out while using the other hand to support the power supply as it is removed from the system.

Note – When hot-swapping a power supply, do not disengage and reengage the supply in rapid succession. Rapid seating and unseating of a power supply will result in false error conditions. After removing a supply, wait for an acknowledgement message on the system console before installing a new supply; otherwise, the environmental monitoring software will not recognize the new device and false error conditions will result.



Caution – A power supply must always occupy each power supply bay. If a power supply fails, you must leave the failed power supply in its bay until you are able to install a functioning replacement power supply. A failed power supply still acts as an air baffle channeling airflow to cool the bottom row of disk drives in the disk cage. Replace the failed power supply as soon as possible to regain N+1 power redundancy.

What Next

To replace the power supply, complete this task:

- “How to Install a Power Supply” on page 160

How to Install a Power Supply

If you are installing a redundant power supply, it is not necessary to shut down and power off the system. For more information, see:

- “About Power Supplies” on page 232
- “About Hot-Pluggable and Hot-Swappable Components” on page 6

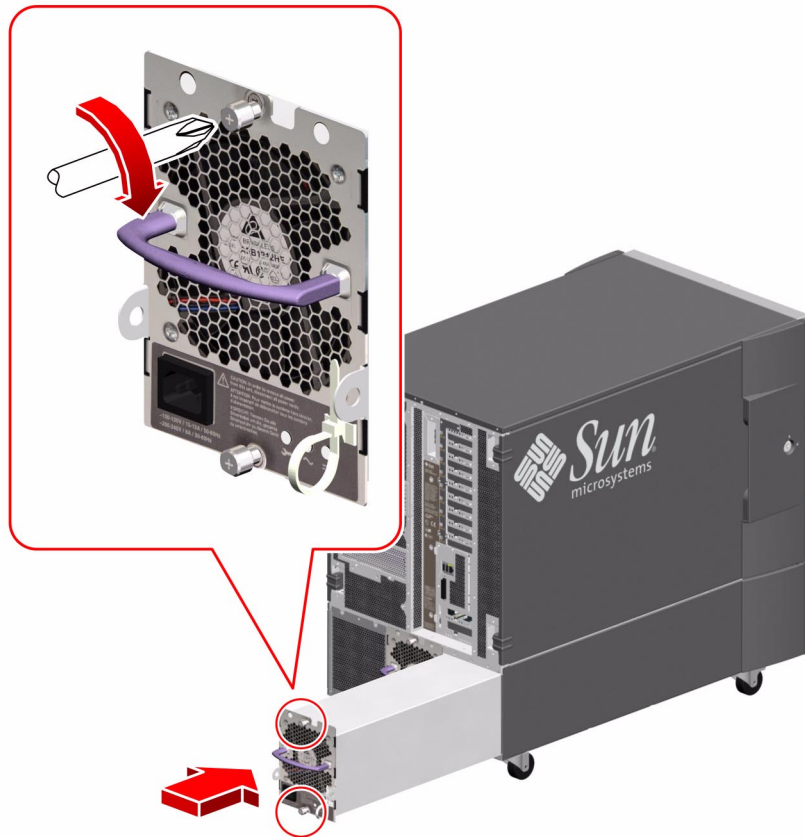
Note – Unlike hot-pluggable devices, you can install or remove a power supply or fan tray while the system is operating at the `ok` prompt. However, in the case of the power supply, you must issue a `reset-all` command at the `ok` prompt in order for the system to recognize the change the next time the operating system is booted.

Note – After removing a power supply during a hot-plug operation, wait for an acknowledgement message on the system console before installing a new supply; otherwise, the environmental monitoring software will not recognize the new device and false error conditions will result.

Note – Use only Sun Fire V890 200-240 VAC power supplies in the Sun Fire V890 system.

What to Do

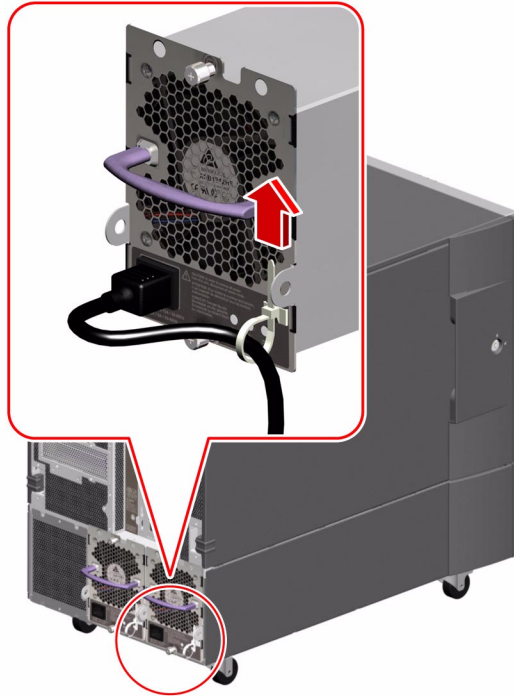
1. **Identify the bay into which you want to install the power supply.**
For information about LEDs, see “About Power Supply LEDs” on page 267.
2. **Slowly slide the power supply into its bay until the connectors on the power supply are fully engaged with the connectors on the power distribution board.**



Caution – If you are hot-plugging a redundant supply, take care to avoid jarring or shocking the system. Also, do not engage and disengage the supply in rapid succession. Rapid seating and unseating of a power supply will result in false error conditions.

3. Tighten the two captive screws that secure the power supply to the chassis.
4. Connect the AC power cord to both the power supply and a dedicated AC power outlet.

Insert the female end of the power cord through the strain-relief tie-wrap loop located to the right of the supply. Tighten the tie-wrap to secure the connection.



What Next

If you installed this part as a new option while the system was powered off, you need to perform a reconfiguration boot. A reconfiguration boot is required in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Remove the System Status Assembly

Before You Begin

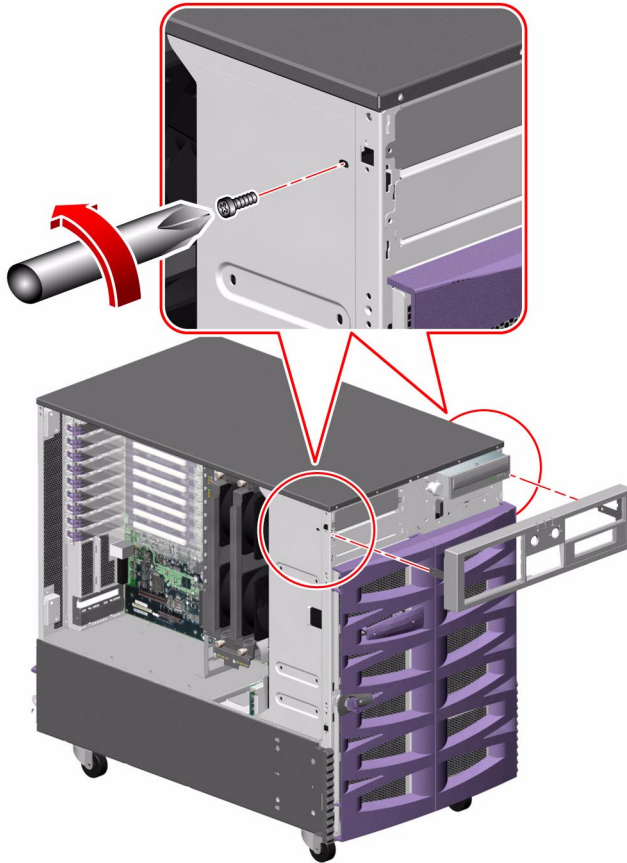
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26

What to Do

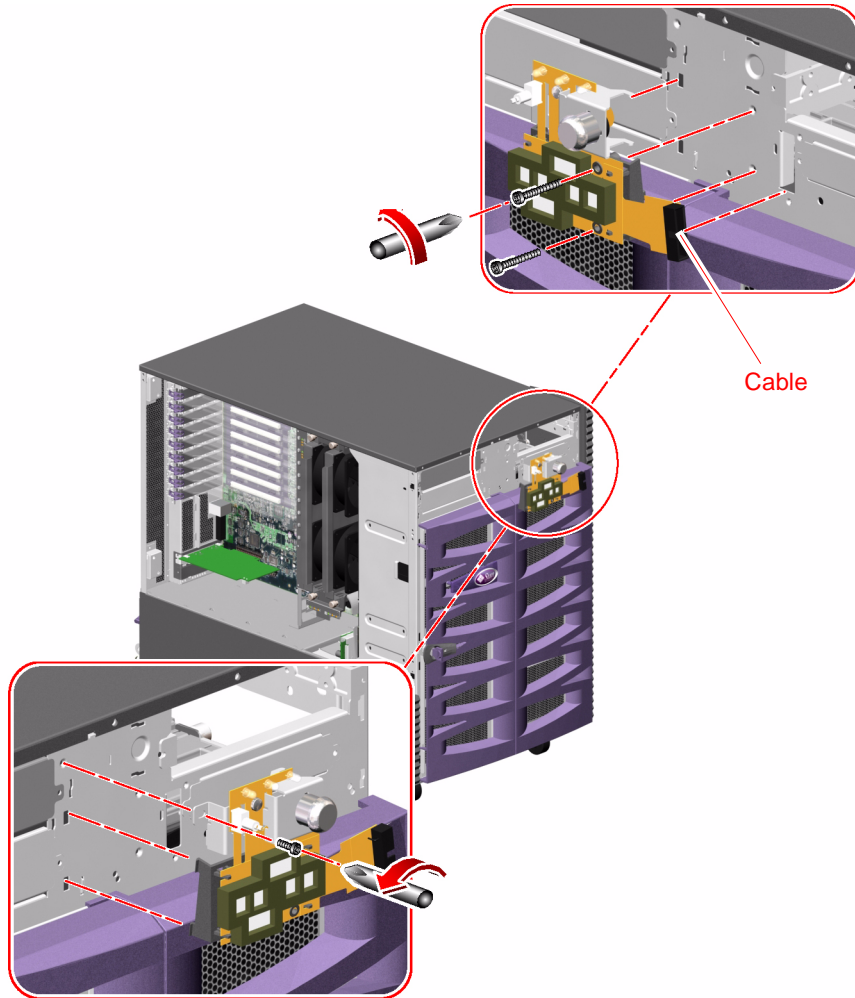
1. Remove the removable media bezel from the system.

Remove the two Phillips screws securing the bezel to the front of the system.



2. Remove the two No. 2 Phillips screws and the three No. 1 Phillips screws securing the system status assembly to the front of the system.

Take care not to damage the flex circuit.



3. Carefully remove the status assembly from the front of the system.

The status assembly is held in place by tabs on the left side and right top of the assembly.

4. Disconnect the system status cable (P31) from the connector on the status assembly.
5. Place the status assembly on an antistatic mat.

What Next

To replace the system status assembly, complete this task:

- “How to Install the System Status Assembly” on page 166

How to Install the System Status Assembly

Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

- 1. Attach the system status cable (P31) to the connector on the side of the system status assembly.**
- 2. Align the status assembly into position on the front of the system.**
Insert the tabs on the left side of the status assembly into their cutouts first, as you align the metal tab on the right top side with its cutout.
- 3. Replace the five Phillips screws that secure the status assembly to the front of the system.**
- 4. Replace the removable media assembly bezel on the front of the system.**
Replace the two Phillips screws that secure the bezel to the system front.

What Next

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

Removing and Installing Backplanes and Cables

This chapter describes how to remove and install backplanes and cables in the system. For a list of part numbers for field-replaceable units (FRUs) and optional equipment, see “Illustrated Parts Breakdown” on page 249.

The following tasks are covered in this chapter:

- “How to Remove the Expansion FC-AL Backplane” on page 168
- “How to Install the Expansion FC-AL Backplane” on page 171
- “How to Remove the Base FC-AL Backplane” on page 177
- “How to Install the Base FC-AL Backplane” on page 180
- “How to Remove the FC-AL Disk Cage” on page 183
- “How to Install the FC-AL Disk Cage” on page 189
- “How to Remove the Power Distribution Board” on page 198
- “How to Install the Power Distribution Board” on page 204

The following information is also included:

- “Cable Connector Locations” on page 212
- “Cable Routing” on page 215

How to Remove the Expansion FC-AL Backplane

Before You Begin

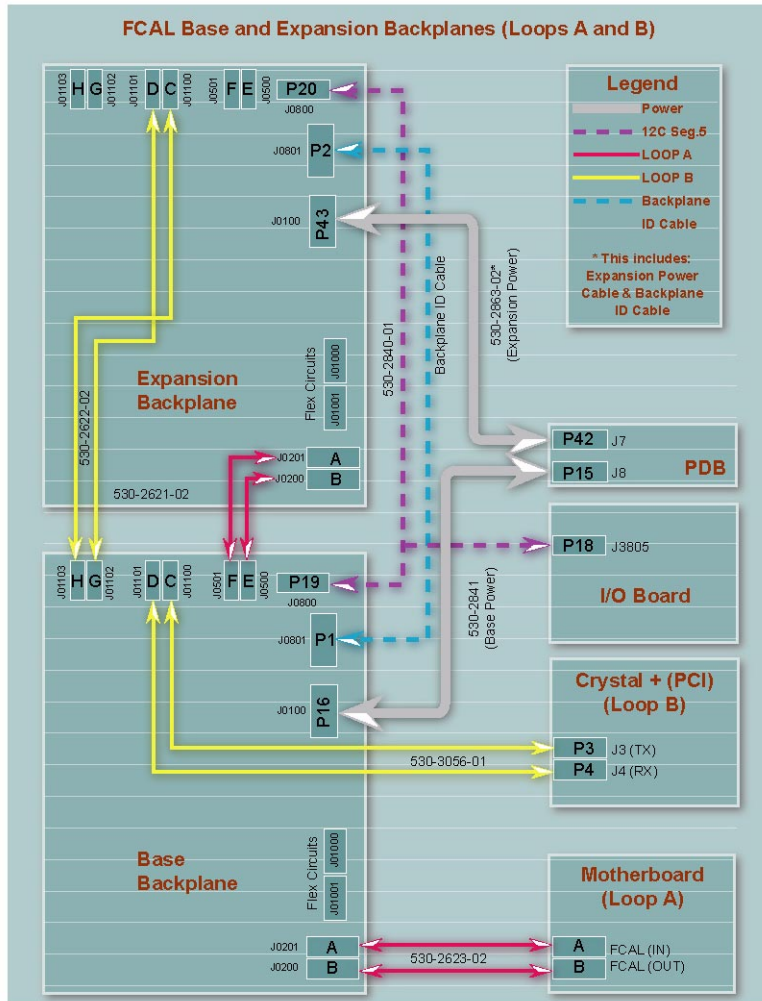
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a Disk Drive” on page 133 (you must remove all the disk drives from the upper half of the disk cage)
- “How to Remove an I/O Fan Tray” on page 76 (you must remove both I/O fan trays)

What to Do

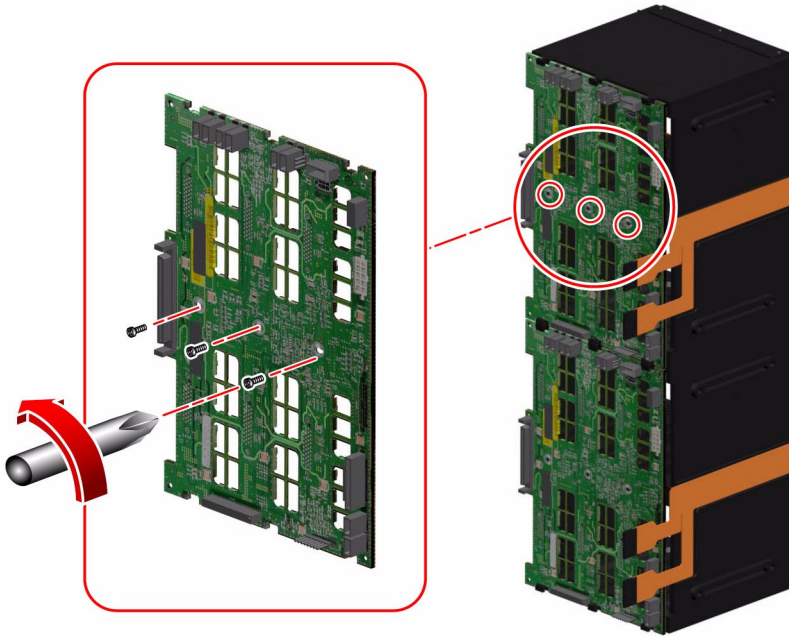
1. **Disconnect the base/expansion cable (P43 and P2) from the expansion backplane at connectors J0100 and J0801.**
For cable connector locations, see “Cable Connector Locations” on page 212.
2. **Disconnect the two disk status flex circuit cables from the expansion backplane at connectors J01000 and J01001.**
3. **Disconnect the I²C cable (P20) from the expansion backplane at connector J0800.**
4. **Disconnect the FC-AL data cables (A and B) from the expansion backplane at connectors A(J0201) and B(J0200).**

- Disconnect the FC-AL data cables (D and C) from the expansion backplane at connectors D(J01101) and C(J01100).



6. Remove the three Phillips screws and nylon washers securing the expansion backplane to the disk cage.

Save the screws and washers to reinstall the replacement backplane.



7. Remove the backplane from the system.
8. Place the expansion backplane on an antistatic mat.
9. If you are not immediately replacing the expansion backplane, install an FC-AL backplane filler panel, if you have one, on the disk cage.
 - a. Align the filler panel screw holes with the holes on the disk cage.
 - b. Fasten the three Phillips screws that secure the filler panel to the backplane.
10. If you are not immediately replacing the expansion FC-AL backplane, disconnect the base/expansion cable (P42) from connector P42/J7(DISKS) on the power distribution board and from connector J0801 on the base FC-AL backplane.
11. If you are not immediately replacing the expansion FC-AL backplane, disconnect the FC-AL data cable (F and E) from connectors F(J0501) and E(J0500) on the base FC-AL backplane.

What Next

To replace the expansion FC-AL backplane, complete this task:

- “How to Install the Expansion FC-AL Backplane” on page 171

To reassemble the system, complete this task:

- “How to Close a Side Door” on page 23

If you are not replacing this part right away, you need to perform a reconfiguration boot in order for the operating system to recognize the configuration change. See:

- “How to Initiate a Reconfiguration Boot” on page 10

How to Install the Expansion FC-AL Backplane

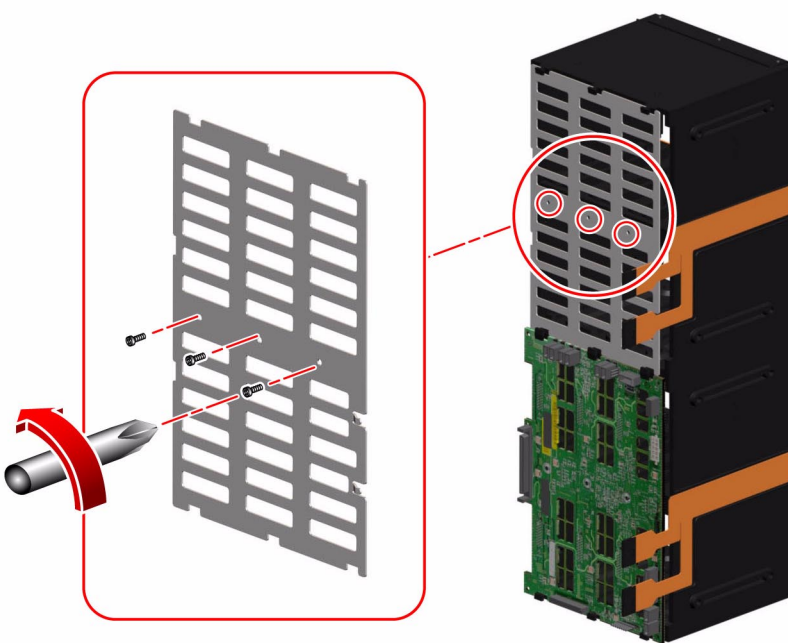
Before You Begin

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove an I/O Fan Tray” on page 76 (you must remove both I/O fan trays)

What to Do

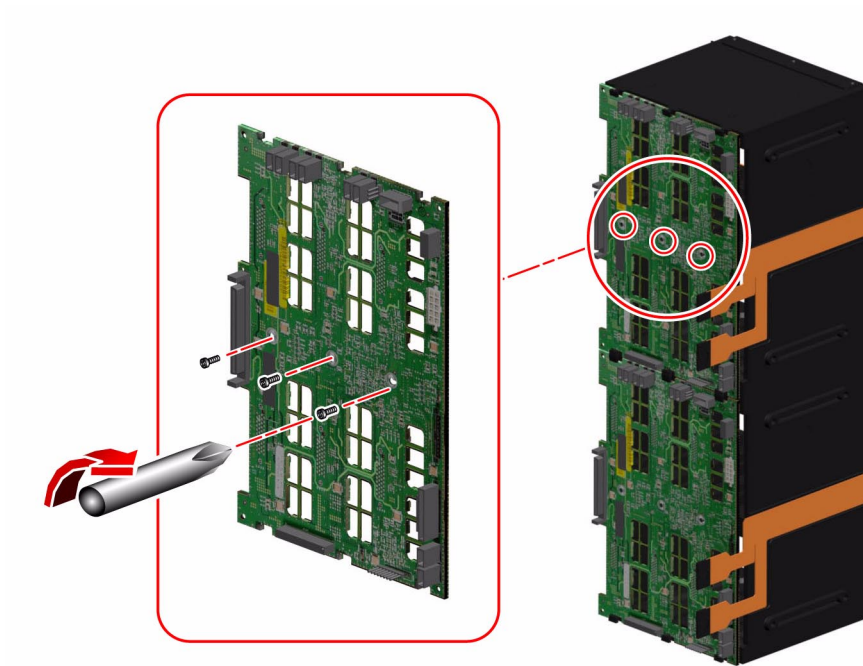
1. If an FC-AL backplane filler panel is installed, remove the three Phillips screws securing the filler panel to the backplane and remove the filler panel from the system.



2. Position the expansion backplane in the system against the disk cage.
Align the three screw holes on the backplane with the screw holes on the disk cage.

3. Fasten the three screws and nylon washers that secure the backplane to the disk cage.

If you are installing the expansion backplane for the first time, the nylon washers are included with the backplane kit.



4. Connect the expansion FC-AL backplane cables to the backplane.

If you are installing an expansion backplane in the system for the first time, install the following cables:

- a. FC-AL data cable (A and B) to connectors A(J0201) and B(J0200) on the expansion backplane and to connectors F(J0501) and E(J0500) on the base FC-AL backplane
- b. Base/expansion cable (P42) to the power distribution board at connector P42/J7(DISKS)

Note – The expansion backplane cable is routed to both FC-AL backplanes. The cable end and connector that goes to the base backplane connector (J0801) will not reach the upper backplane. The two cable ends ganged together go to the upper backplane at connectors J0801 and J0100.

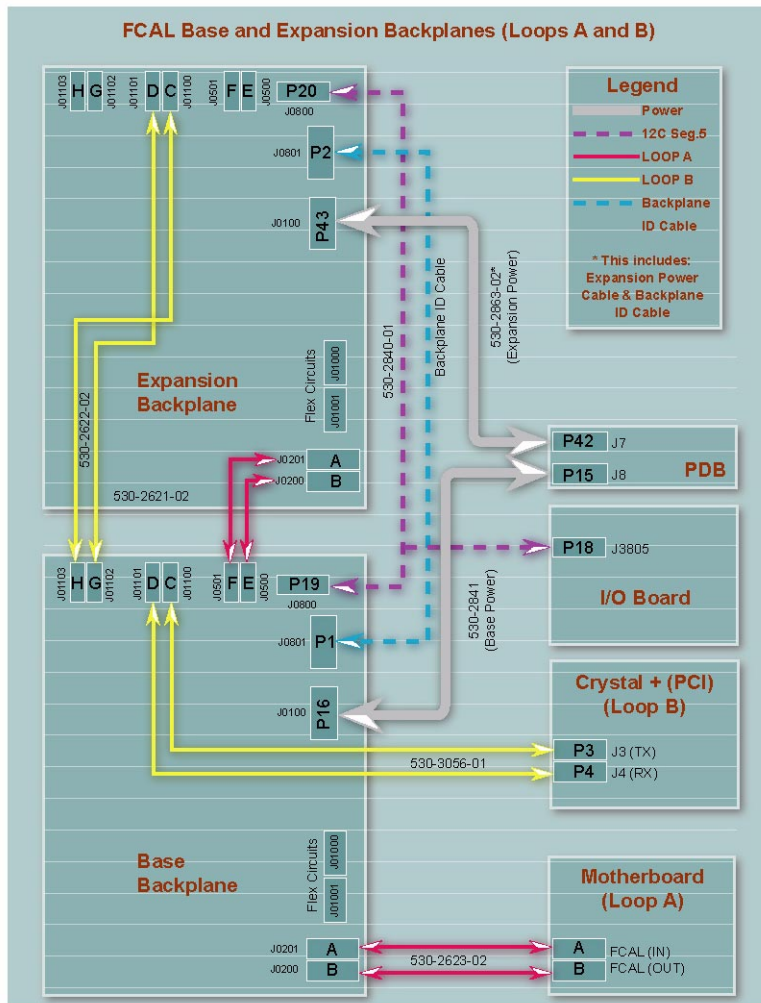
- c. **Base/expansion cable (P1 - Base) to connector J0801 on the base backplane**
- d. **Base/expansion cable (P2 and P43) to connector J0801 and J0100 on the expansion backplane**
- e. **I²C cable (P20) to connector J0800 on the expansion backplane**

The expansion backplane I²C cable is part of a cable assembly that includes the base backplane I²C cable that is already connected to the base backplane. The expansion backplane end of the cable is ganged with a group of cables running through the cable guides on the chassis centerplane and must be freed from the uppermost cable guide so that it can reach the expansion backplane.

If you are replacing the expansion FC-AL backplane, connect the following cables:

- a. **FC-AL data cable (F and E) from connectors F(J0501) and E(J0500) on the base backplane to connectors A(J0201) and B(J0200) on the expansion backplane**
 - b. **Base/expansion cable (P2 and P43) to connectors J0801 and J0100 on the expansion backplane**
 - c. **I²C cable (P20) to connector J0800 on the expansion backplane**
5. **Connect the Loop B FC-AL data cable (H and G) to connectors H(J01103) and G(J01102) on the base backplane and to connectors C(J01100) and D(J01101) on the expansion backplane.**

6. Connect the two disk status flex circuit cables to the expansion backplane at connectors J01000 and J01001.



7. To reassemble the system, complete these tasks:
 - a. "How to Install a Disk Drive" on page 136
 - b. "How to Install an I/O Fan Tray" on page 78
 - c. "How to Close a Side Door" on page 23

8. After installing an expansion backplane, power on the system and bring up the system up to the `ok` prompt.
9. Allow the system to remain at the `ok` prompt for at least 10 minutes to ensure that the two backplanes are loaded with the same version of firmware.

The system automatically synchronizes the firmware versions between the two backplanes.

10. After the required waiting period, boot the system to single-user mode.

```
ok boot -s
```

11. To verify that the firmware synchronization process has completed successfully, type the following `luxadm` subcommand:

```
# luxadm display enclosure-name
```

where *enclosure-name* is the enclosure name assigned to the Sun Fire V890 internal storage array—by default, `FCloop`. If you need to verify the enclosure name first, use the `luxadm probe` subcommand.

The output of the `display` subcommand shows the status of each SSC100 processor in the system. The following is an excerpt of sample output for a dual-backplane system.

```
SSC100's - 0=Base Bkpln, 1=Base LoopB, 2=Exp Bkpln, 3=Exp LoopB
SSC100 #0:    O.K. (9228/ 3A20)
SSC100 #1:    O.K. (9228/ 3A20)
SSC100 #2:    O.K. (9228/ 3A20)
SSC100 #3:    O.K. (9228/ 3A20)
```

Verify that each SSC100 processor displays an `O.K.` status and that each displays the same firmware version in parentheses. If so, the firmware synchronization process has completed successfully. Otherwise, wait another two minutes or so and repeat this process.

Note – For more information about the `luxadm` utility, see *Platform Notes: Using the luxadm Software*, which is included on the Sun Fire V890 Documentation CD.

12. Once the firmware synchronization process is complete, you can restore the system to multiuser mode.

For example, type:

```
# init 3
```

What Next

If you installed this part as a new option, you need to perform a reconfiguration boot in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

How to Remove the Base FC-AL Backplane

Before You Begin

Complete these tasks:

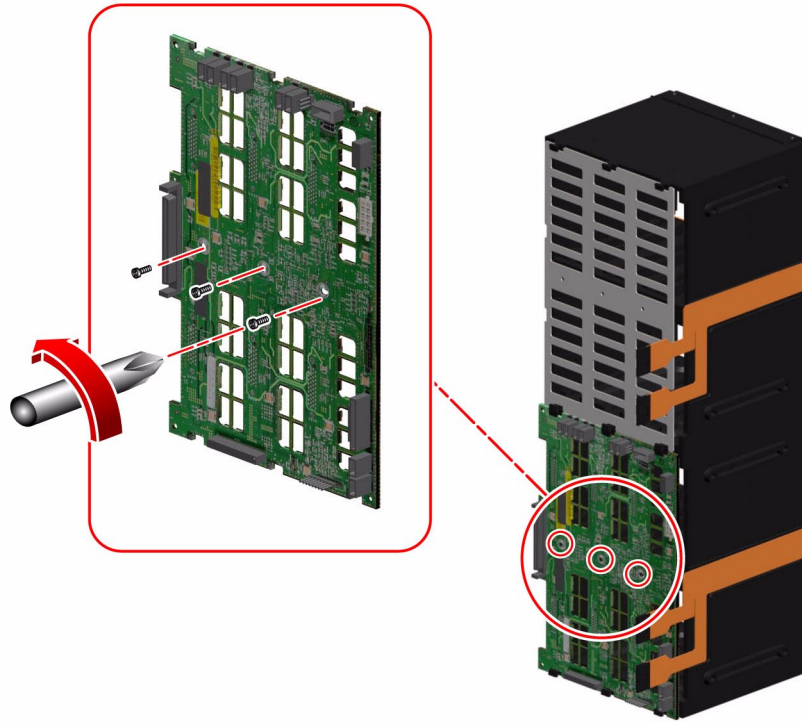
- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a Disk Drive” on page 133 (you must remove all the disk drives from the disk cage)
- “How to Remove an I/O Fan Tray” on page 76 (you must remove both I/O fan trays)
- “How to Remove a CPU Fan Tray” on page 48
- “How to Remove the CPU Fan Status Assembly” on page 57

- “How to Remove the FC-AL Disk Cage” on page 183

What to Do

- 1. If the expansion FC-AL backplane is installed, disconnect the following cables:**
For cable connector locations, see “Cable Connector Locations” on page 212.
 - a. FC-AL data cable (H and G) from the base backplane at connectors H(J01103) and G(J01102)**
 - b. FC-AL data cable (F and E) from the base backplane at connectors F(J01103) and E(J01102)**
- 2. Disconnect the disk status flex circuit cables from the base backplane at connectors J01001 and J01000.**

3. Remove the three Phillips screws and nylon washers securing the base backplane to the disk cage.



4. Remove the backplane from the system.
5. Place the backplane on an antistatic mat.

What Next

To replace the base FC-AL backplane, complete this task:

- “How to Install the Base FC-AL Backplane” on page 180

How to Install the Base FC-AL Backplane

Before You Begin

Complete this task:

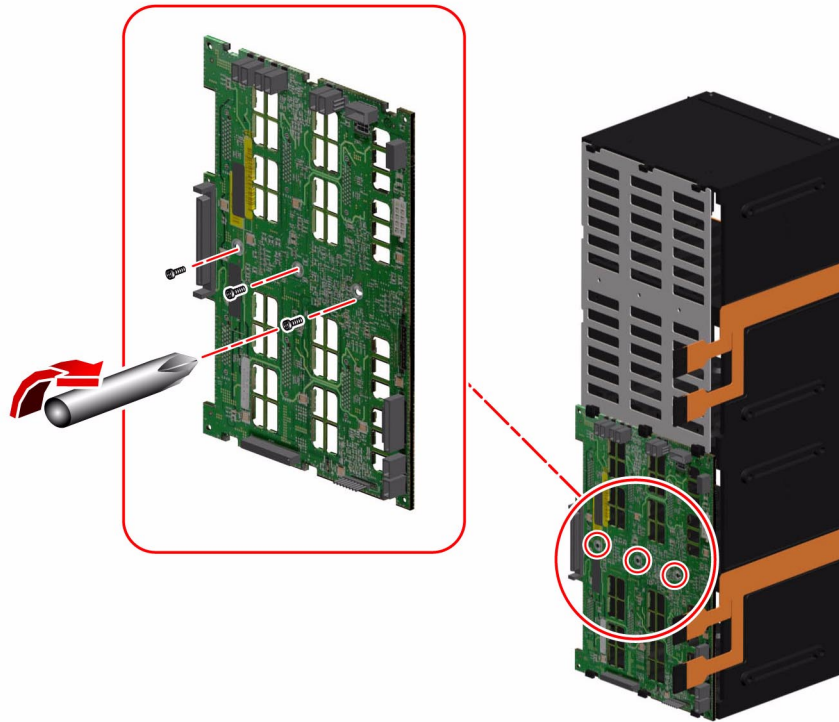
- "How to Avoid Electrostatic Discharge" on page 26

What to Do

- 1. Position the base FC-AL backplane against the disk cage.**

Align the three screw holes on the backplane with the screw holes on the disk cage.

2. Fasten the three screws and nylon washers that secure the backplane to the disk cage.



3. Connect the disk status flex circuit cables to the base backplane at connectors J01001 and J01000.
4. If the expansion FC-AL backplane is installed, connect the following cables:
For cable connector locations, see “Cable Connector Locations” on page 212.
 - a. FC-AL data cable (C and D) from connectors C(J01100) and D(J01101) on the expansion backplane to the base backplane at connectors H(J01103) and G(J01102)
 - a. FC-AL data cable (A and B) from connectors A(J0201) and B(J0200) on the expansion backplane to the base backplane at connectors F(J0501) and E(J0500)
5. To reassemble the system, complete these tasks:
 - a. “How to Install the FC-AL Disk Cage” on page 189
 - b. “How to Install the CPU Fan Status Assembly” on page 60
 - c. “How to Install a CPU Fan Tray” on page 50

- d. "How to Install an I/O Fan Tray" on page 78
 - e. "How to Install a Disk Drive" on page 136
 - f. "How to Close a Side Door" on page 23
6. After installing an expansion backplane, power on the system and bring up the system to the `ok` prompt.
 7. Allow the system to remain at the `ok` prompt for at least 10 minutes to ensure that the two backplanes are loaded with the same version of firmware.
The system automatically synchronizes the firmware versions between the two backplanes.
 8. After the required waiting period, boot the system to single-user mode.

```
ok boot -s
```

9. To verify that the firmware synchronization process has completed successfully, type the following `luxadm` subcommand:

```
# luxadm display enclosure-name
```

where *enclosure_name* is the enclosure name assigned to the Sun Fire V890 internal storage array—by default, `FCloop`. If you need to verify the enclosure name first, use the `luxadm probe` subcommand.

The output of the `display` subcommand shows the status of each SSC100 processor in the system. The following is an excerpt of sample output for a dual-backplane system.

```
SSC100's - 0=Base Bkpln, 1=Base LoopB, 2=Exp Bkpln, 3=Exp LoopB
SSC100 #0:   O.K.(9226/ 3A20)
SSC100 #1:   O.K.(9226/ 3A20)
SSC100 #2:   O.K.(9226/ 3A20)
SSC100 #3:   O.K.(9226/ 3A20)
```

Verify that each SSC100 processor displays an `O.K.` status and that each displays the same firmware version in parentheses. If so, the firmware synchronization process has completed successfully. Otherwise, wait another two minutes or so and repeat this process.

Note – For more information about the luxadm utility, see *Platform Notes: Using luxadm Software*, which is included on the Sun Fire V890 Documentation CD.

10. **Once the firmware synchronization process is complete, you can restore the system to multiuser mode.**

For example, type:

```
# init 3
```

What Next

If you installed this part as a new option, you need to perform a reconfiguration boot in order for the operating system to recognize the new device. See:

- “How to Initiate a Reconfiguration Boot” on page 10.

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

How to Remove the FC-AL Disk Cage

Before You Begin

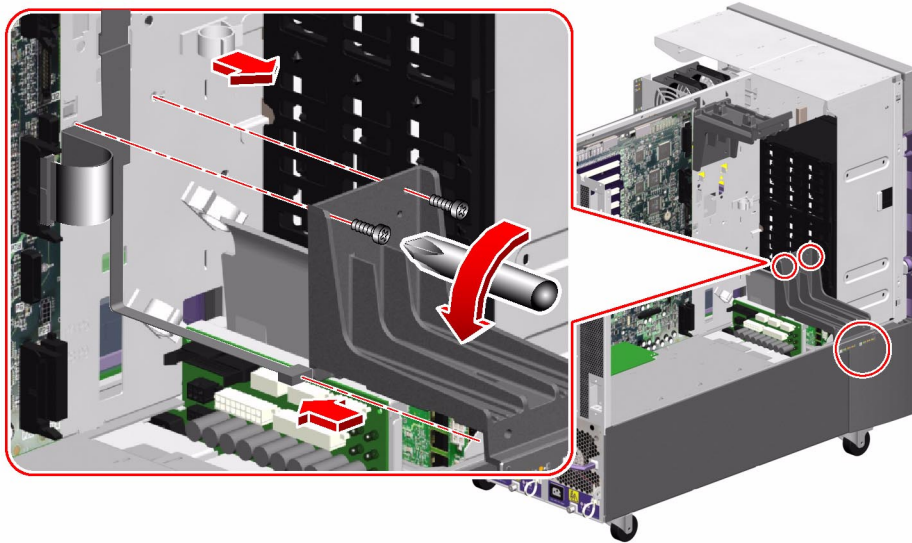
Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a Disk Drive” on page 133 (you must remove all the disk drives from the disk cage)
- “How to Remove an I/O Fan Tray” on page 76 (you must remove both I/O fan trays)
- “How to Remove a CPU Fan Tray” on page 48
- “How to Remove the CPU Fan Status Assembly” on page 57

What to Do

1. Remove the lower I/O fan tray bracket.

- a. Disconnect the fan status cable (P27) from the back of the I/O fan flex circuit.
- b. Remove the two Phillips screws securing the lower I/O fan tray bracket to the centerplane.



c. Rotate the lower I/O fan tray bracket out from the system.

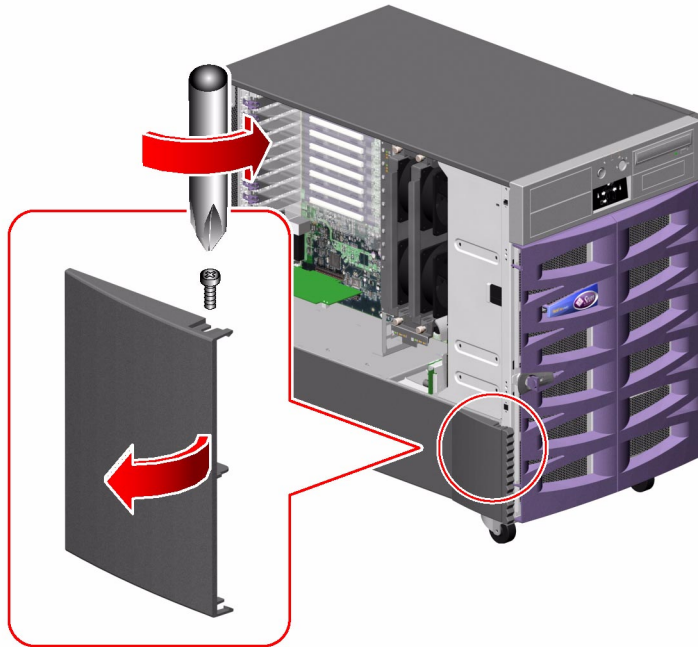
d. Place the bracket on an antistatic mat.

2. Disconnect the following cables from each backplane installed:

For cable connector locations, see “Cable Connector Locations” on page 212.

- a. Base/expansion cable and/or base backplane power cable from the backplane at connectors J0100 and J0801
- b. I²C cable (P19) from the backplane at connector J0800
- c. If a Sun StorEdge PCI Dual Fibre Channel Host Adapter card is connected to the base backplane, the FC-AL data cables from the base backplane at connectors C(J01100) and D(J01101)

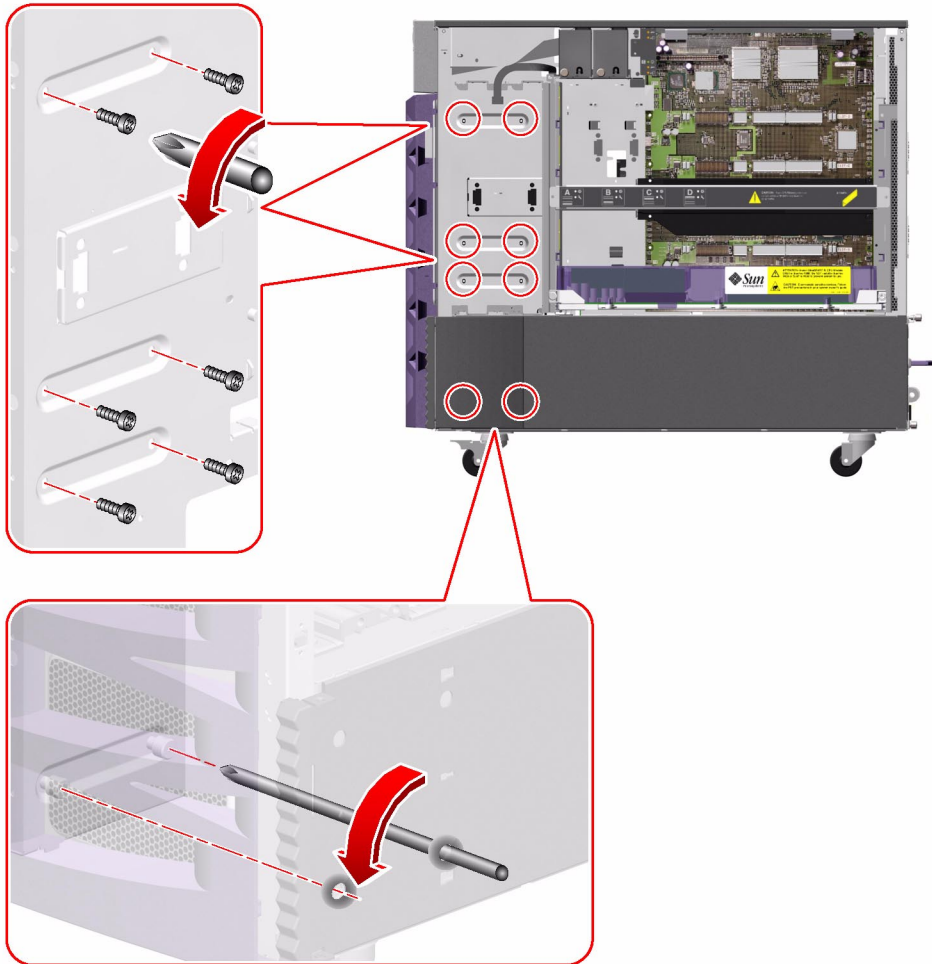
3. Remove the I/O side fender from the system.
 - a. Remove the Phillips screw from the top of the fender.



- b. Holding the front of the fender, rotate it out and away from the chassis.

The fender is held in place by two tabs on the back of the fender that fit into the lower chassis.
4. Remove the six CPU-side screws securing the disk cage to the system.
 - a. Remove both CPU fan trays.
 - b. Remove the five screws securing the CPU fan tray guide to the chassis.

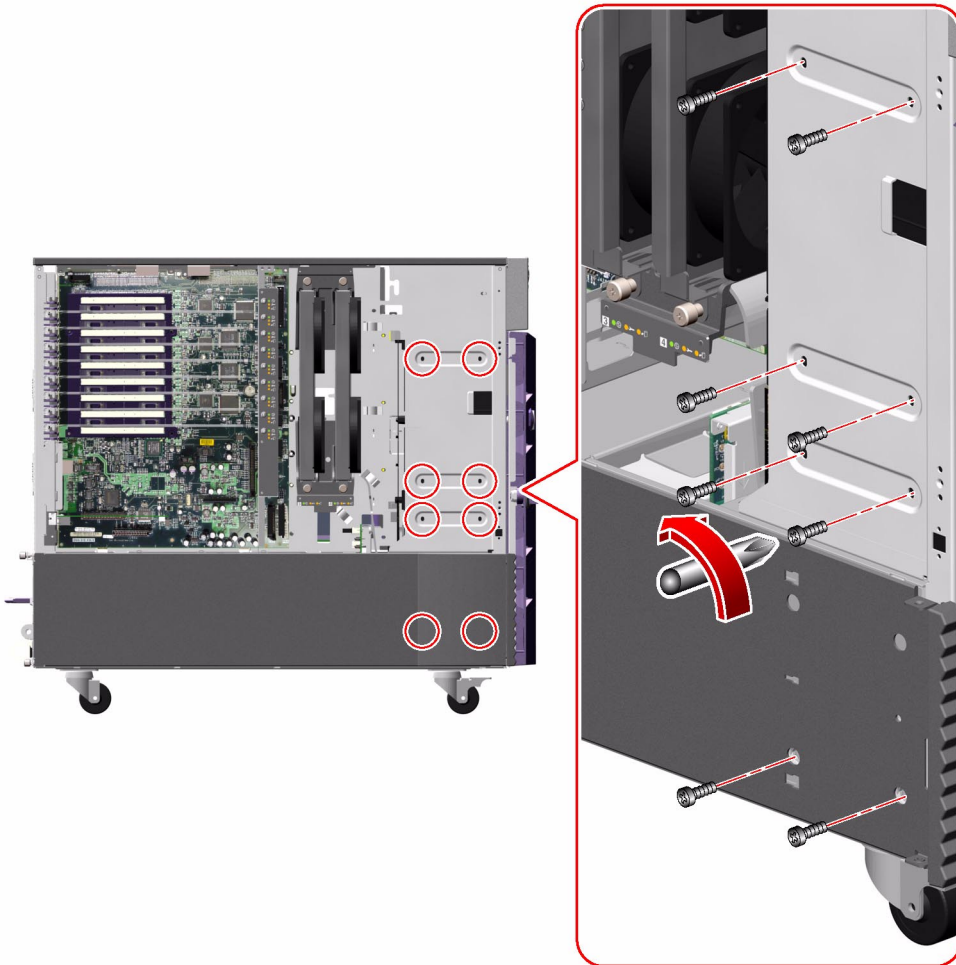
- c. Remove the six CPU-side screws securing the mid-upper section of the disk cage to the chassis.



- d. Loosen the two captive screws securing the lower section of the disk cage to the chassis.

The captive screws are accessed from two cutouts in the chassis, under the mounting point for the CPU fan tray guide.

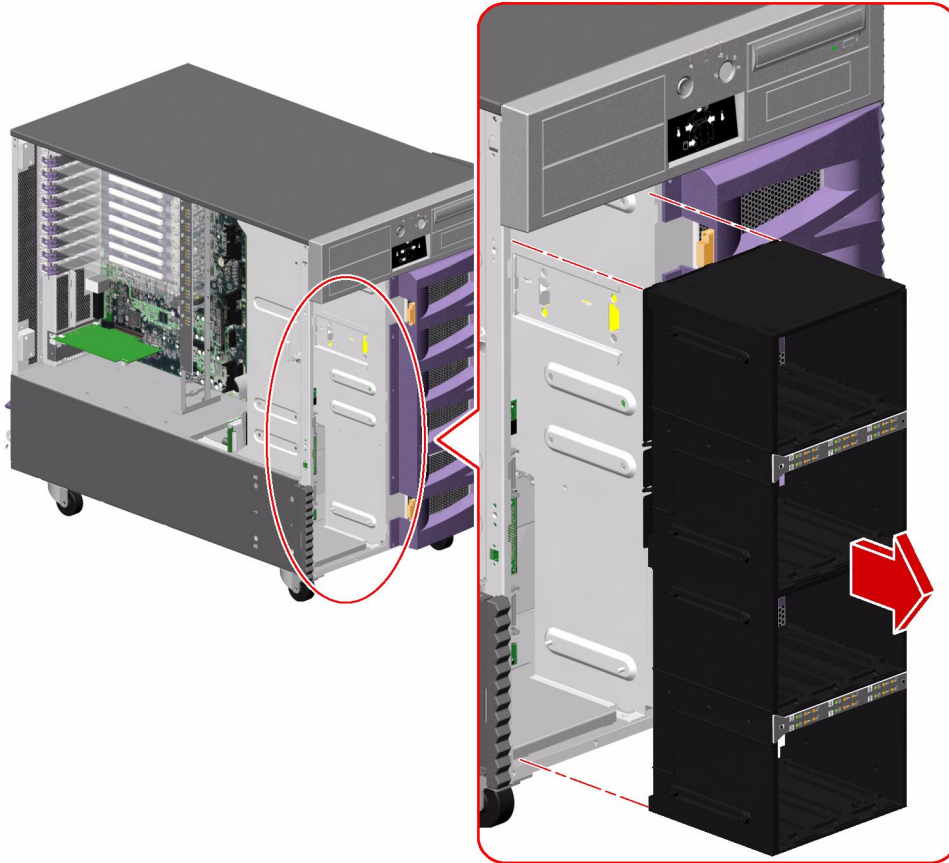
5. Remove the eight I/O side screws securing the disk cage to the system.



6. Carefully pull the disk cage forward about 2 inches (5 cm), enough to give you clear access to the remaining cables on the base backplane.

7. Disconnect the base backplane FC-AL data cable (A and B) from the base backplane at connectors A(J0201) and B(J0200).

8. Slide the disk cage out fully from the system.



9. Place the disk cage on an antistatic mat.

What Next

To replace the disk cage, complete this task:

- “How to Install the FC-AL Disk Cage” on page 189

How to Install the FC-AL Disk Cage

Before You Begin

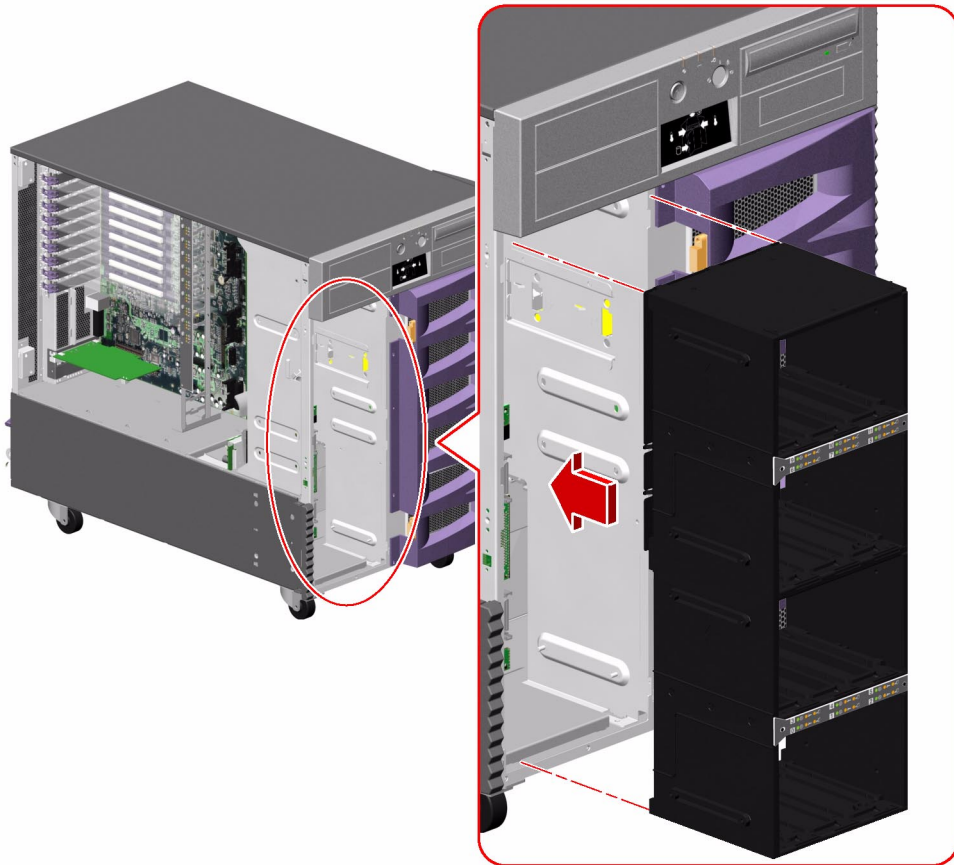
Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

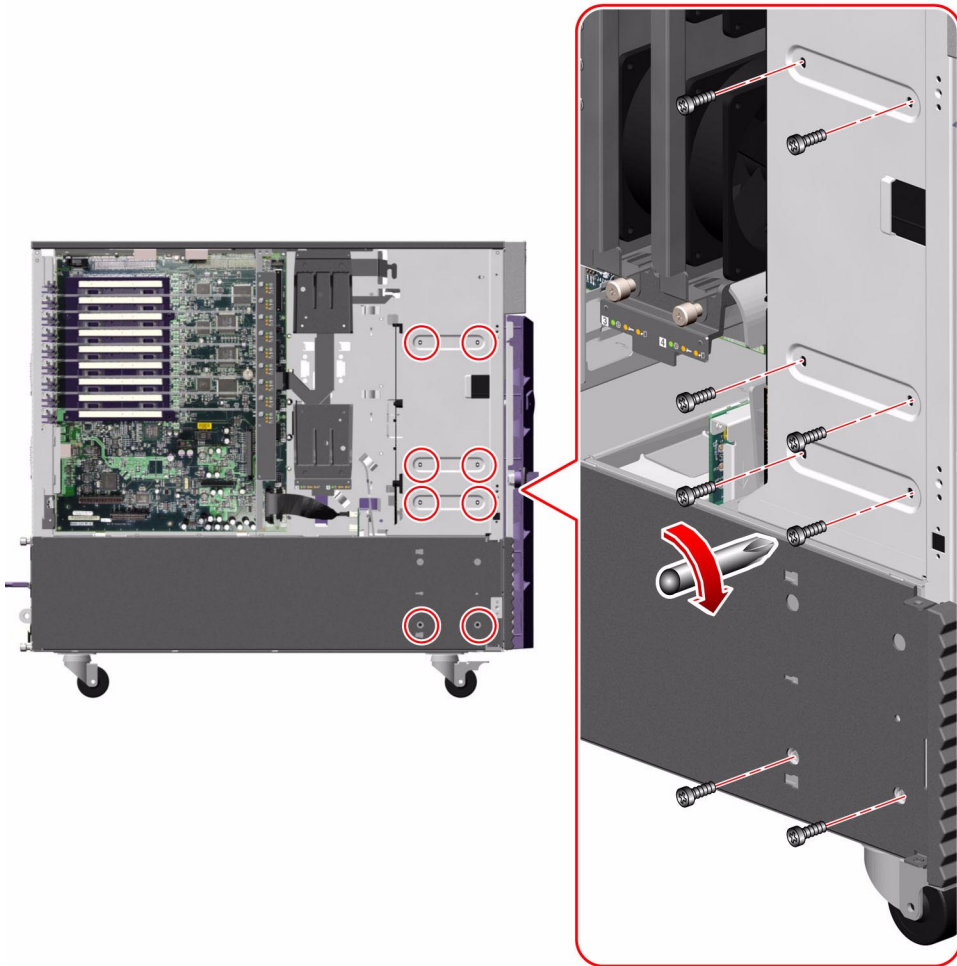
1. Carefully align the FC-AL disk cage with the disk cage bay.

2. Slide the disk cage into the system until it is about 2 inches (5 cm) from its final position in the disk cage bay.

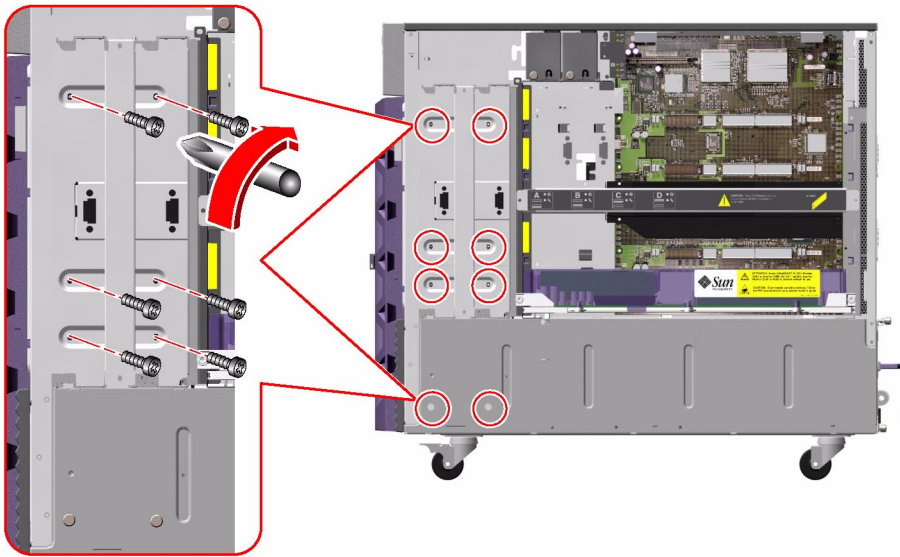


3. Connect the base backplane FC-AL data cable (A and B) from the motherboard to the base backplane at connectors A(J0201) and B(J0200).
4. Slide the disk cage fully into the system.

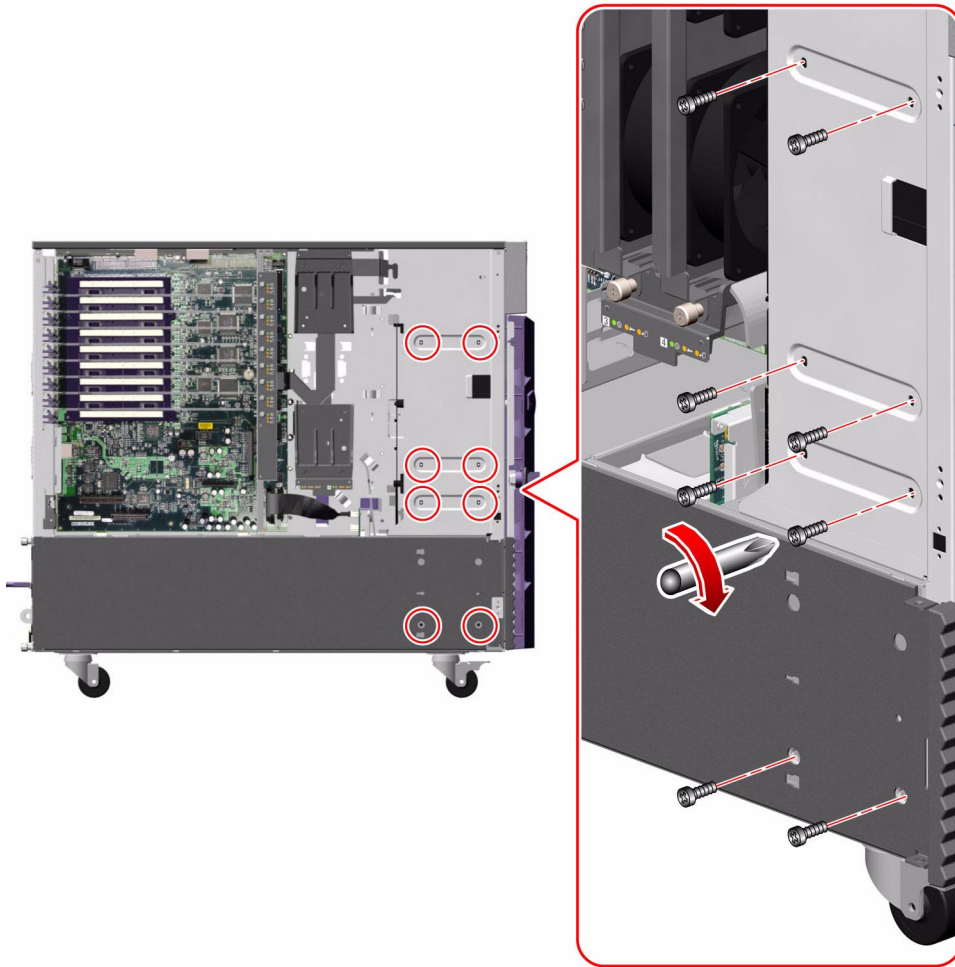
5. On the I/O side of the system, loosely fasten the eight Phillips screws that secure the disk cage to the chassis.
Do not fully tighten the screws.



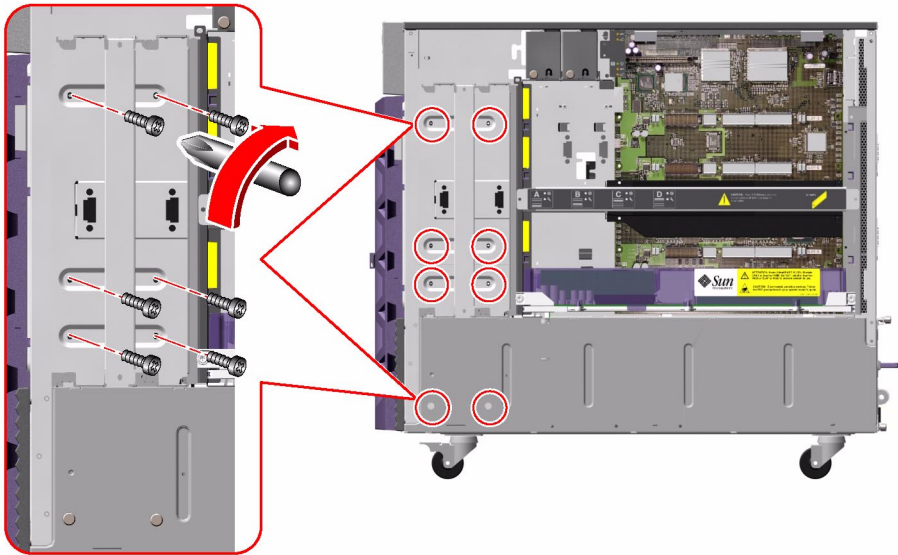
6. On the CPU side of the system, loosely fasten the six Phillips screws that secure the disk cage to the chassis.
Do not fully tighten the screws.



7. On the I/O side of the system, fully tighten the eight Phillips screws that secure the disk cage to the chassis.



8. On the CPU side of the system, fully tighten the six Phillips screws that secure the disk cage to the chassis.



9. Tighten the two captive screws that secure the lower section of the disk cage to the chassis.

The captive screws are accessed from two cutouts in the chassis, under the mounting point for the CPU fan tray guide.

10. Connect the following cables to the base backplane:

For cable connector locations, see "Cable Connector Locations" on page 212.

- a. Base backplane power cable (P16) to the base backplane at connector J0100

The cable is connected to the power distribution board at connector P15/J8.

- b. I²C cable (P19) to the base backplane at connector J0800

- c. If a Sun StorEdge PCI Dual Fibre Channel Host Adapter card is installed to control Loop B of the FC-AL disk backplane, the card's FC-AL data cable to the base backplane at connectors C(J01100) and D(J01101)

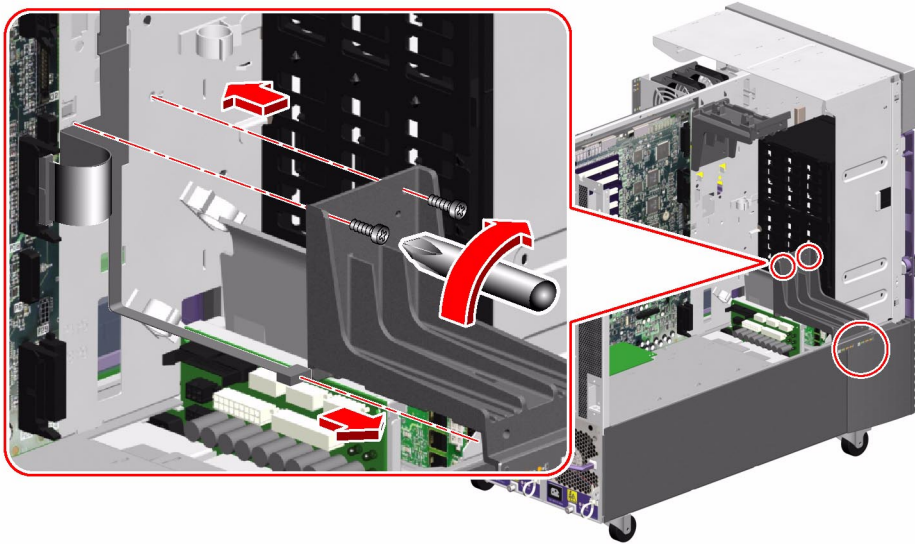
11. If the expansion FC-AL disk backplane is installed, connect the following cables:

- a. Base/expansion cable (P2 and P43) to the expansion backplane at connectors J0801 and J0100

- b. Base/expansion cable (P1) to the base backplane at connector J0801
- c. I²C cable (P20) to the expansion backplane at connector J0800

12. Replace the lower I/O fan tray bracket.

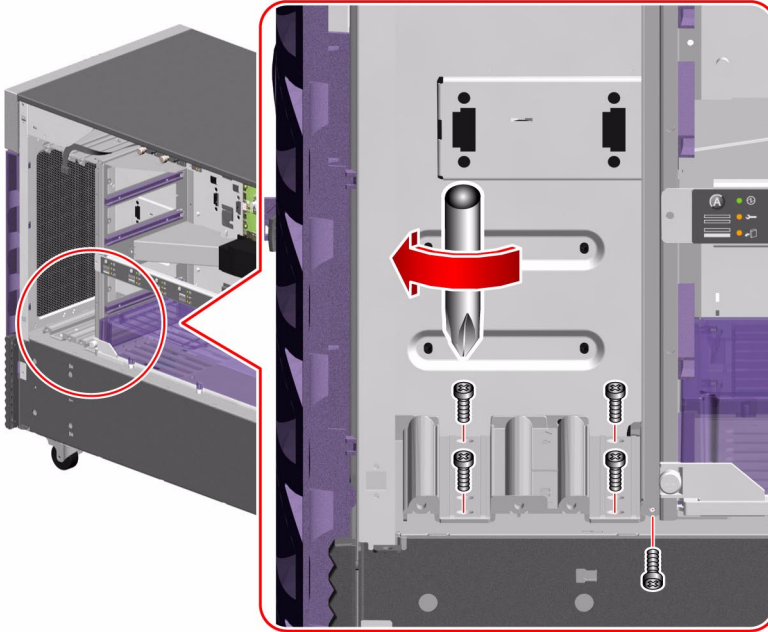
- a. Connect the fan status cable (P27) to the connector on the back of the I/O fan status flex circuit.
- b. Place the lower I/O fan bracket into the system against the centerplane.
Ensure that the ribbon cables behind the lower I/O fan bracket remain flat against the centerplane.
- c. Fasten the two Phillips screws that secure the lower I/O fan tray bracket to the centerplane.



13. Replace the lower CPU fan tray bracket.

- a. Replace the four flathead Phillips screws that secure the bracket to the chassis.

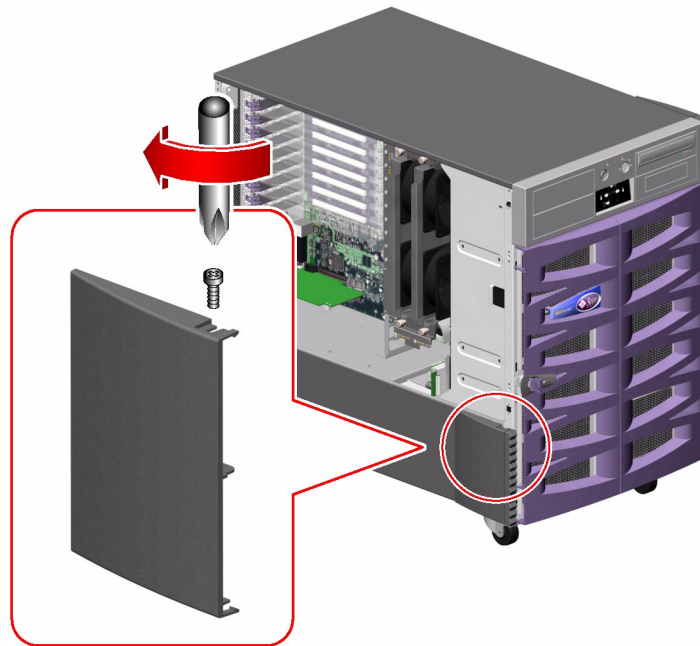
- b. Replace the Phillips screw that secures the front of the CPU fan tray bracket to the front CPU/Memory board bracket.



14. Replace the I/O side fender.

- a. Holding the front of the fender, align the tabs with the cutouts on the chassis and rotate the fender until it snaps into place.

b. Replace the Phillips screw on the top of the fender.



What Next

To reassemble the system, complete these tasks:

- “How to Install the CPU Fan Status Assembly” on page 60
- “How to Install a CPU Fan Tray” on page 50
- “How to Install an I/O Fan Tray” on page 78
- “How to Close a Side Door” on page 23
- “How to Install a Disk Drive” on page 136

How to Remove the Power Distribution Board

Before You Begin

Complete these tasks:

- “How to Power Off the System” on page 5
- “How to Open and Remove a Side Door” on page 21
- “How to Avoid Electrostatic Discharge” on page 26
- “How to Remove a Power Supply” on page 155 (you must remove all power supplies from the system)
- “How to Remove an I/O Fan Tray” on page 76 (you must remove both I/O fan trays)
- “How to Remove a Disk Drive” on page 133 (you must remove the disk drive from Slot 3)

What to Do

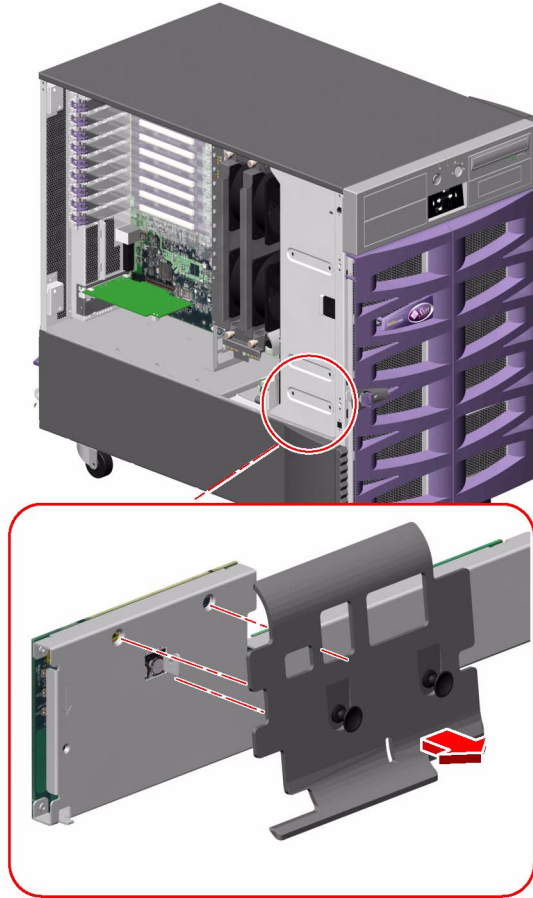
1. Disconnect the following cables from the power distribution board:

For cable connector locations, see “Cable Connector Locations” on page 212.

- a. **Base backplane power cable (P15) from the power distribution board at connector P15/J8(DISKS)**
- b. **If an expansion backplane is installed, base/expansion cable (P42) from the power distribution board at connector P42/J7(DISKS)**
- c. **RME power cable (P17) from the power distribution board at connector P17/J6(RME)**
- d. **I/O signal cable (P25) from the power distribution board at connector P25/J9(Signals)**
- e. **I/O board power cable (P13) from the power distribution board at connector P13/J5(I/O BOARD)**

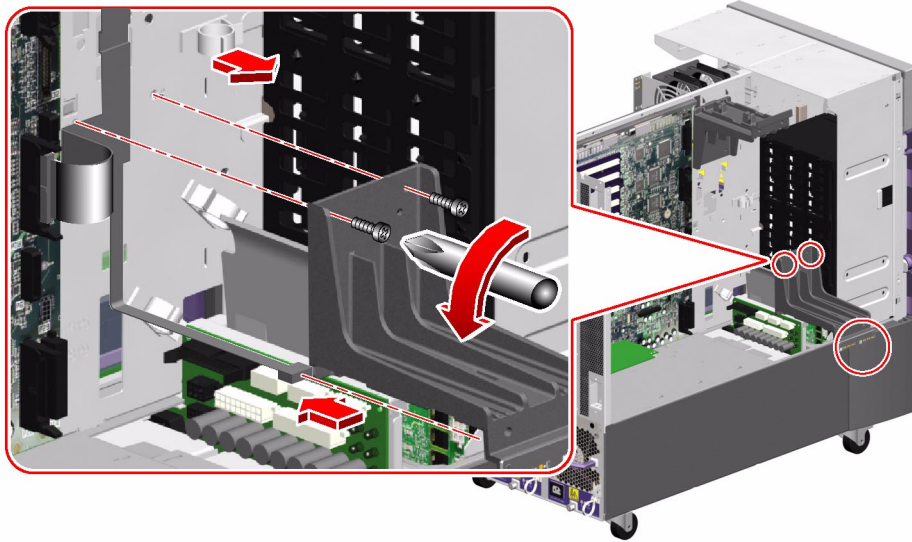
2. Remove the PCI air deflector from the power distribution board bracket.

Pull out the two plastic pins securing the PCI air deflector and remove it from the system.



3. Remove the lower I/O fan tray bracket.

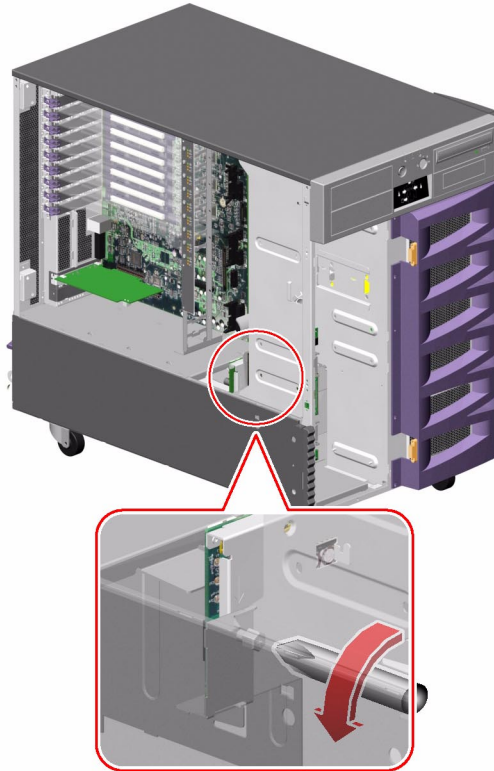
- a. Disconnect the fan status cable (P27) from the back of the I/O fan flex circuit.
- b. Remove the two Phillips screws securing the lower I/O fan tray bracket to the centerplane.



- c. Rotate the lower I/O fan tray bracket out from the system.
- d. Place the bracket on an antistatic mat.

4. Loosen the captive Phillips screw securing the power distribution board to its bracket.

Access the captive screw from the front of the system, through disk drive Slot 3.

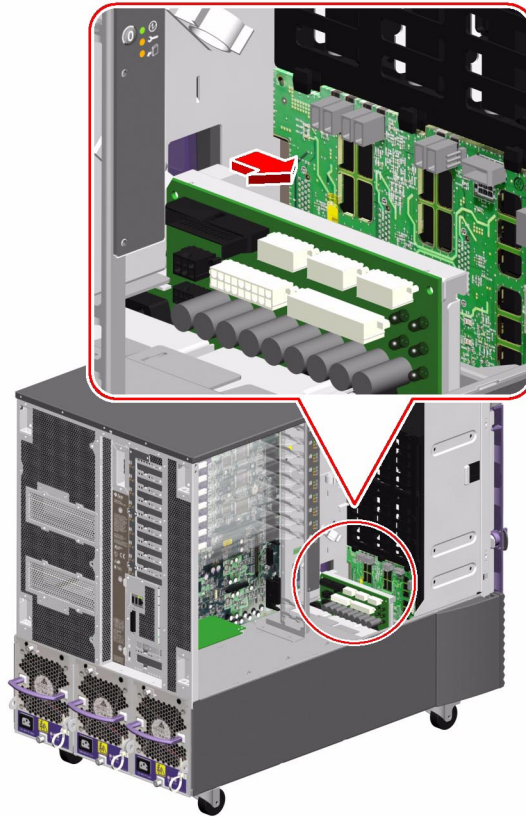


5. Carefully pull the power distribution board out from the system until you can easily access the two cable assemblies still attached to the power distribution board.

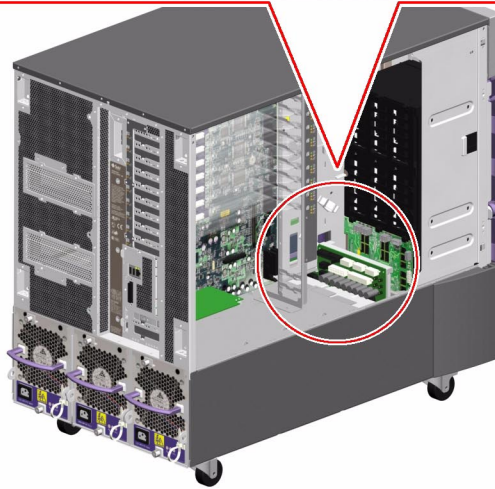
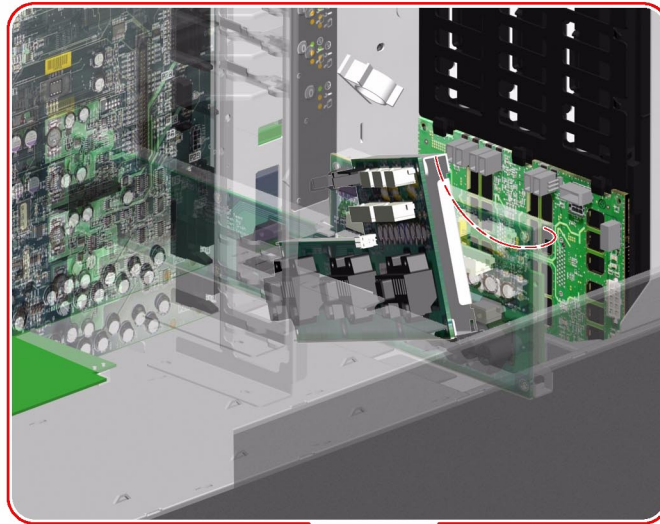
The power distribution board is held in place by two tabs that fit into cutouts on the chassis sidewall and by one tab on the centerplane.

Note – Be careful not to damage the I²C cable and the motherboard power cables still attached to the power distribution board.

a. Pull the power distribution board out until it clears the tab on the centerplane.



b. Carefully rotate the board away from the power distribution board bracket.



- c. Pull the power distribution board out from the system enough so that you can disconnect the two cables still attached to the board.
6. Disconnect the following cables from the power distribution board:
- a. Motherboard power cables (P7A and P7B) from the power distribution board at connectors P7/J4 and P7/J11(MOTHERBOARD)

- b. I/O board remote sense cable (P38) from the power distribution board at connector P38/J10(Sense/5Vstby)
7. Remove the power distribution board from the system.
8. Place the board on an antistatic mat.

What Next

To replace the power distribution board, complete this task:

- “How to Install the Power Distribution Board” on page 204

How to Install the Power Distribution Board

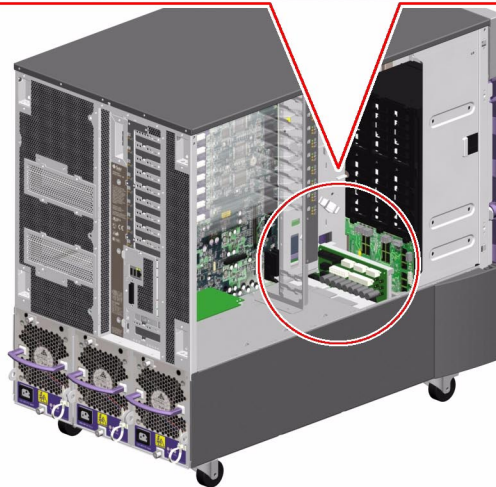
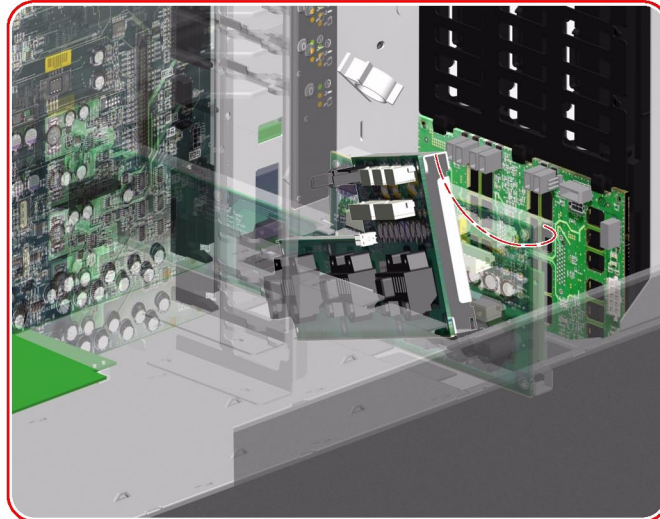
Before You Begin

Complete this task:

- “How to Avoid Electrostatic Discharge” on page 26

What to Do

1. Angle the power distribution board into its position in the chassis far enough to still easily access connectors P7/J4 and P7/J11(MOTHERBOARD) and P38/J10(Sense/5Vstby) on the power distribution board.



2. Connect the following cables to the power distribution board:

For cable connector locations, see “Cable Connector Locations” on page 212.

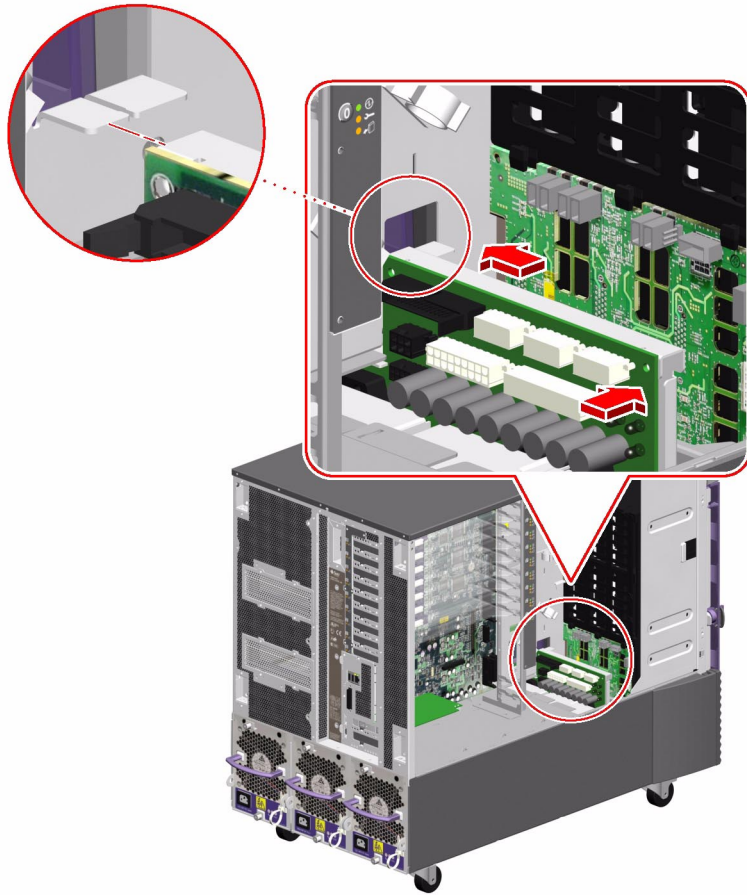
a. Motherboard power cables (P7A and P7B) to the power distribution board at connectors P7/J4 and P7/J11(MOTHERBOARD)

b. I/O board remote sense cable (P38) to the power distribution board at connector P38/J10(Sense/5Vstby)

3. Carefully finish positioning the power distribution board in the chassis against its bracket.

a. Align the board by placing the bracket side of the board against the power distribution board bracket so that the hole on the top of the board aligns with the tab on the centerplane.

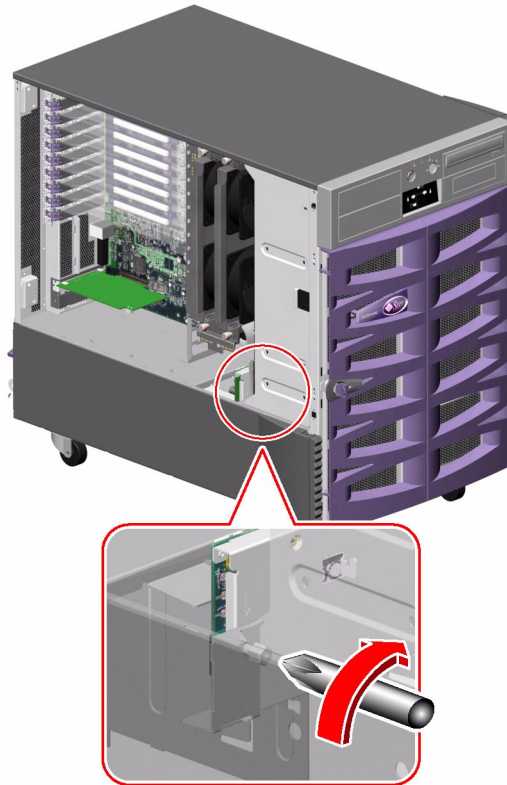
This ensures that the tabs on the end of the power distribution board are aligned with their cutouts in the sidewall of the chassis.



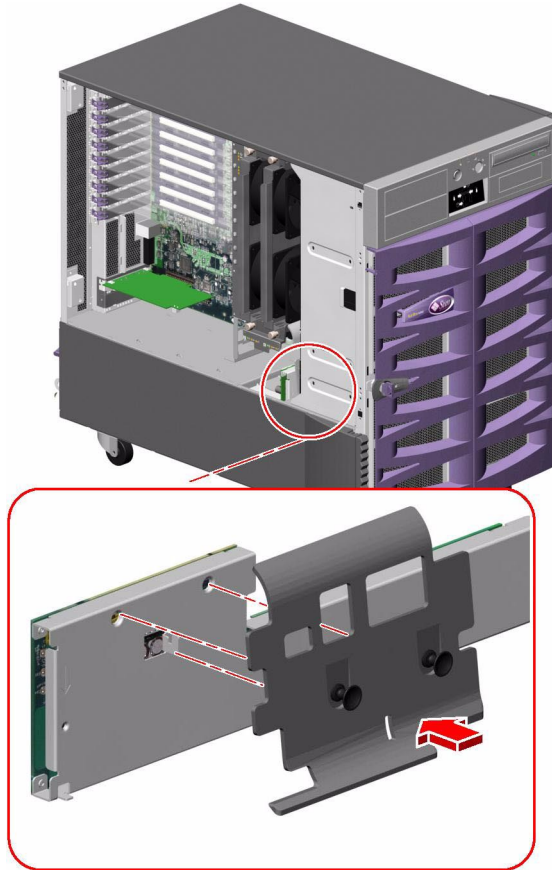
- b. Slide the board fully into the chassis until the tabs on the end of the power distribution board are in their cutouts on the chassis sidewall and the tab on the centerplane is in the hole on the top of the power distribution board.**

4. Tighten the captive Phillips screw that secures the backplane to the backplane bracket.

Access the captive screw from the front of the system, through disk drive Slot 3.

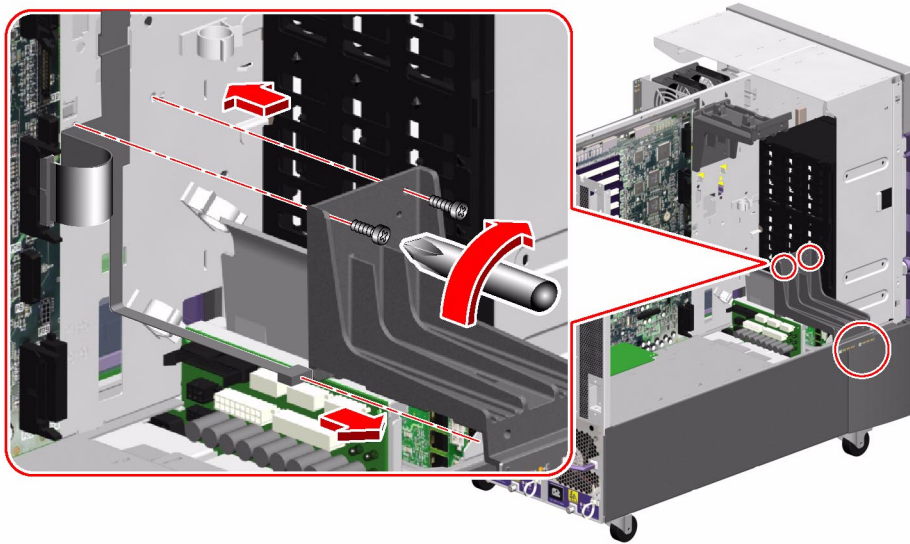


5. Attach the PCI air deflector to the power distribution board bracket.
 - a. Align the cutout on the air deflector with the tab on the bracket.



- b. Push in the two plastic pins that secure the PCI air deflector to the bracket.
6. Connect the following cables to the power distribution board:
 - a. I/O board power cable (P13) to the power distribution board at connector P13/J5(I/O BOARD)
 - b. I/O signal cable (P25) to the power distribution board at connector P25/J9(Signals)
 - c. RME power cable (P17) to the power distribution board at connector P17/J6(RME)

- d. If an expansion backplane is installed, base/expansion cable (P42) to the power distribution board at connector P42/J7(DISKS)
 - e. Base backplane power cable (P15) to the power distribution board at connector P15/J8(DISKS)
7. Replace the lower I/O fan tray bracket.
- a. Connect the fan status cable (P27) to the connector on the back of the I/O fan status flex circuit.
 - b. Place the lower I/O fan bracket in the system against the centerplane.
Ensure that the ribbon cables behind the lower I/O fan bracket remain flat against the centerplane.
 - c. Fasten the two Phillips screws that secure the lower I/O fan tray bracket to the centerplane.



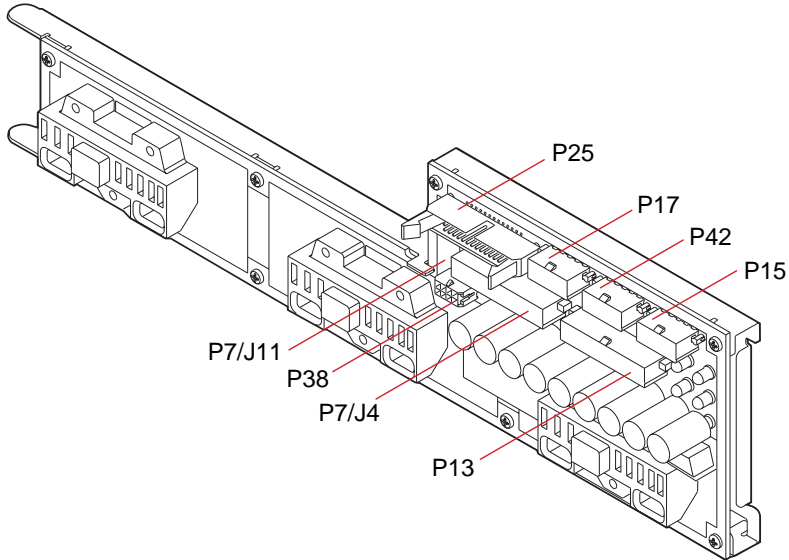
What Next

To reassemble the system, complete these tasks:

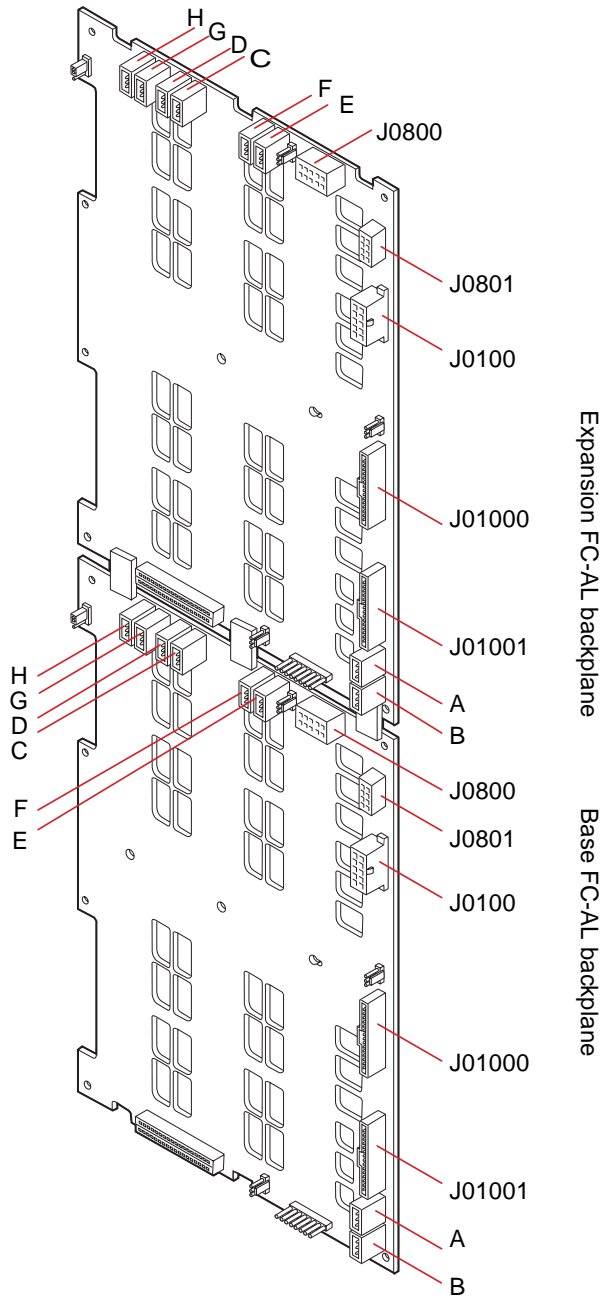
- “How to Install an I/O Fan Tray” on page 78
- “How to Install a Power Supply” on page 160
- “How to Close a Side Door” on page 23
- “How to Install a Disk Drive” on page 136

Note – Be sure to run POST and OpenBoot Diagnostics tests to verify that the system functions correctly with the part(s) you have just installed. See *OpenBoot PROM Enhancements for Diagnostic Operation* on the Sun Fire V890 Documentation CD.

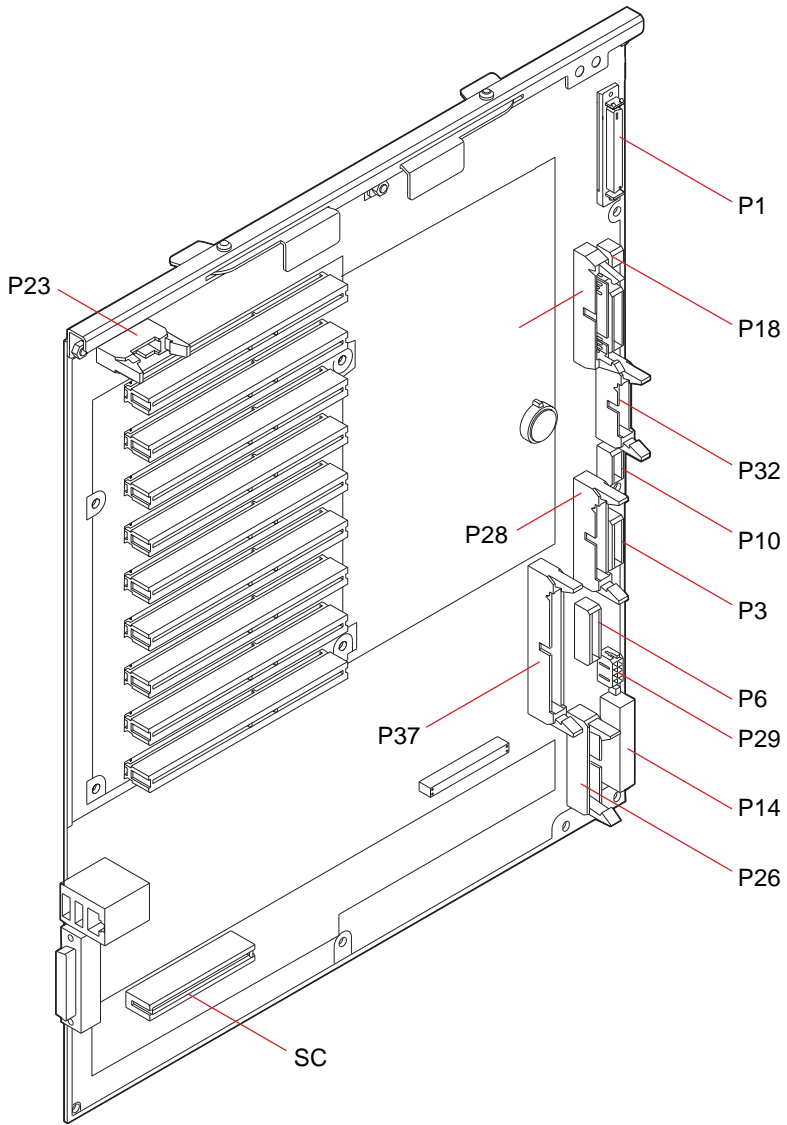
Cable Connector Locations



Power Distribution Board



FC-AL Backplane



I/O Board

Cable Routing

| Cable Name | Part Number | Cable end | Connect to |
|---------------------------------|-------------|--|--|
| I/O board power cable | 530-2818 | P14 P13 | I/O board at P14(J3203) PDB at P13/J5(I/O BOARD) |
| I ² C cable | 530-2840 | P18 P19 P20 | I/O board at P18(J3805) Base backplane at J0800 Expansion backplane at J0800 |
| Base backplane power cable | 530-2841 | P15 P16 | PDB at P15/J8(DISKS) Base backplane at J0100 |
| Base/expansion cable | 530-2863 | P42 P1(Base) P43(Expansion) P2(Expansion) | PDB at P42/J7(DISKS) Base backplane at J0801 Expansion backplane at J0100 Expansion backplane at J0801 |
| I/O board remote sense cable | 530-2745 | P29 P38 | I/O board at P29(J3202) PDB at P38/J10(Sense/5Vstby) |
| I/O signal cable | 530-2746 | P26 P25 | I/O board at P26(J3201) PDB at P25/J9(Signals) |
| Motherboard power cable | 530-3285 | P7A P7B P8 P9 | PDB at MOTHERBOARD(P7/J11) PDB at MOTHERBOARD(P7/J4) Motherboard at P8(J4702) Motherboard at P9(48VPOWER) |
| FC-AL data cable (short cable) | 530-2621 | F, E A, B | Base backplane at F, E Expansion backplane at A, B |
| FC-AL data cable (medium cable) | 530-2622 | H, G C, D | Base backplane at H, G Expansion backplane at C, D |
| FC-AL data cable (long cable) | 530-2623 | A, B A, B | Motherboard at A, B Base backplane at A, B |
| Loop B PCI FC-AL data cable | 530-3056 | D C P3 P4 | Base backplane at D Base backplane at C PCI card at J3 PCI card at J4 |

| Cable Name | Part Number | Cable end | Connect to |
|-------------------------------|-------------|---|--|
| Fan power cable | 530-2747 | P10 P6 P3 P4, P5 P1, P2 P11 P12 | I/O board at P10(J3807) I/O board at P6(J3804) I/O board at P3(J3806) Centerplane cutouts P4, P5(I/O fans) Centerplane cutouts P1, P2(CPU fans) Top cutout on motherboard fan status bracket Bottom cutout on motherboard fan status bracket |
| PCI internal status cable | 530-2835 | P36 P37 | I/O board at P36(J3102) PCI internal LED flex circuit |
| PCI external status cable | 530-2836 | P23 P24 | I/O board at P23(J3601) PCI external LED flex circuit |
| System status assembly cable | 530-2839 | P32 P31 | I/O board at P32(J3803) System status assembly |
| CPU/Memory board status cable | 530-2837 | P35 P34 | Motherboard at P35 CPU/Memory board status assembly |
| Fan status cable | 530-2838 | P28 P27 P30 P29 | I/O board at P28(J3801) I/O fan status flex circuit Motherboard fan status flex circuit CPU fan status flex circuit |
| RME power cable | 530-2548 | P17 P3 P2 P4 P5 | PDB at P17/J6(RME) Lower 5.25-inch RME device Upper 5.25-inch RME device DVD-ROM 3.25-inch RME device |
| DVD cable | 530-3298 | P1 P2 | I/O board at P1(J3402) DVD-ROM |
| RME wide SCSI cable (option) | 530-3302 | P1 P2 P3 | SCSI adapter card Lower 5.25-inch RME device Upper 5.25-inch RME device |

Hardware Configuration

This chapter provides hardware configuration information for the Sun Fire V890 server. The following topics are covered in this chapter:

- “About CPU/Memory Boards” on page 218
- “About Memory Modules” on page 221
- “About PCI Cards and Buses” on page 226
- “About the System Controller Card and RSC Software” on page 230
- “About Power Supplies” on page 232
- “About Fan Trays” on page 235
- “About Removable Media Devices” on page 238
- “About Serial Ports” on page 239
- “About USB Ports” on page 240
- “About Hardware Jumpers” on page 241
- “About Serial Port Jumpers” on page 242
- “About Flash PROM Jumpers” on page 243

Note – For configuration information about the internal mass storage subsystem and network interfaces, see the *Sun Fire V890 Server Owner's Guide*, available on the Sun Fire V890 Documentation CD.

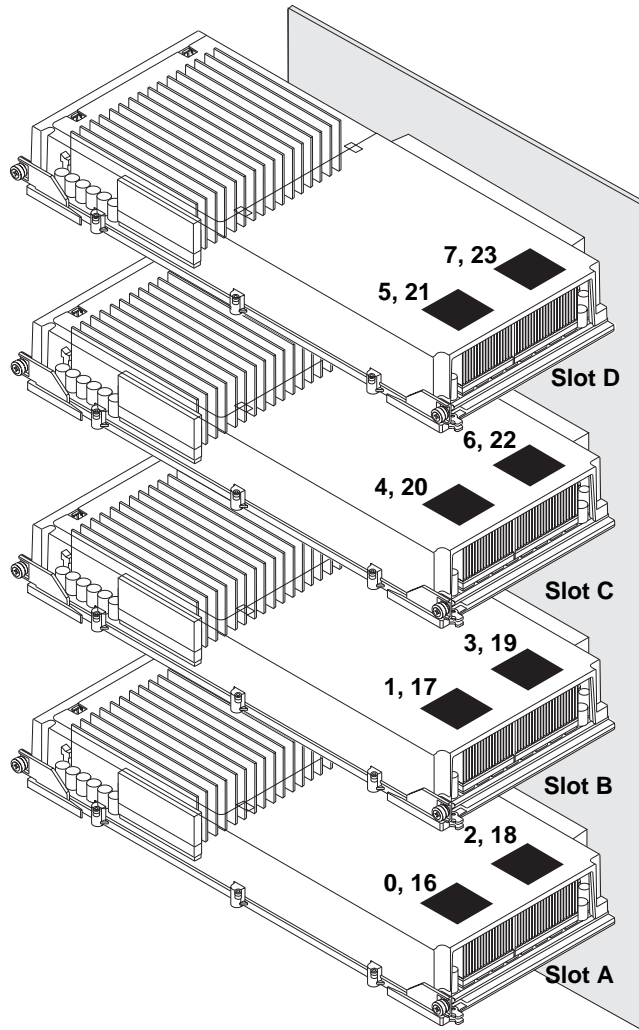
About CPU/Memory Boards

The system motherboard provides slots for up to four CPU/Memory boards. Each CPU/Memory board incorporates two UltraSPARC IV chip multithreading (CMT) processors, with 16 Mbytes of static random access memory (SRAM) Level 2 external cache memory per processor, and slots for 16 memory modules. The external cache memory cannot be upgraded.

Note – You must use CPU/Memory boards of the same speed within a Sun Fire V890 system. CPU/Memory boards with UltraSPARC IV processors operate at a speed of 1200 MHz.

Chip multithreading technology allows two threads per UltraSPARC IV processor. With this dual-threaded architecture, each UltraSPARC IV processor consists of two virtual processors with shared memory. A dynamic arbitration scheme enables each thread to make optimal use of the available memory, resulting in higher performance.

The following illustration shows the four CPU/Memory board slots on the system motherboard. The slots are labeled A through D from bottom to top. The virtual processors (CPUs) in the system have unique numbers, depending on the slot where each CPU/Memory board resides. For example, a CPU/Memory board installed in slot D always contains CPUs 5 and 21 and 7 and 23, even if there are no other CPU/Memory boards installed in the system.



The UltraSPARC IV processor is a high-performance, highly integrated, CMP processor that enables an increase in application throughput while maintaining binary compatibility. The UltraSPARC IV processor implements a 64-bit SPARC International Version 9 Instruction Set Architecture (ISA).

The UltraSPARC IV processor improves throughput performance in commercial applications such as databases, web servers, and high performance technical computing. It supports both 2D and 3D graphics, as well as image processing, video compression and decompression, and video effects through the sophisticated Visual Instruction Set (VIS™) extension. VIS provides high levels of multimedia performance, including real-time video compression and decompression and two streams of MPEG-2 decompression at full broadcast quality with no additional hardware support.

The Sun Fire V890 server employs a shared-memory multiprocessor architecture with all processors sharing the same physical address space. The system processors, main memory, and I/O subsystem communicate via a high-speed system interconnect bus, operating at a clock rate of 150 MHz. In a system configured with multiple CPU/Memory boards, all main memory is accessible from any processor over the system bus. The main memory is shared logically by all processors and I/O devices in the system.

For information about memory modules and memory configuration guidelines, see “About Memory Modules” on page 221.



Caution – CPU/Memory boards must be installed only by qualified service personnel. After installing a CPU/Memory board, you must perform a reconfiguration boot in order for the operating system to recognize the new device. See “How to Initiate a Reconfiguration Boot” on page 10.



Caution – Either a CPU/Memory board or an air baffle must be installed in each CPU/Memory slot at all times. After removing a CPU/Memory board, you must install a replacement board or an air baffle immediately to avoid an automatic thermal shutdown. For more information, see “How to Install a CPU/Memory Board” on page 34.

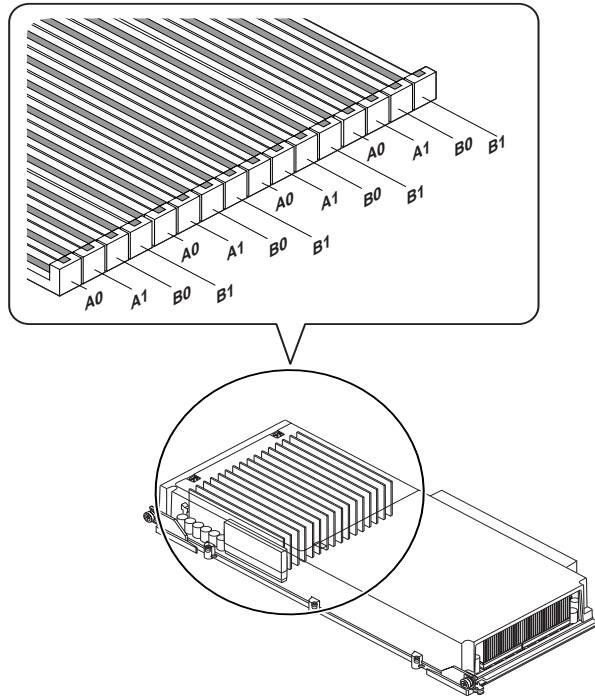
About Memory Modules

The Sun Fire V890 server uses 3.3-volt, high-capacity dual inline memory modules (DIMMs). The DIMMs are built with synchronous dynamic random access memory (SDRAM) chips that operate at a 75-MHz clock frequency. The system supports DIMMs with 512-Mbyte and 1-Gbyte capacities.

Each CPU/Memory board contains slots for 16 DIMMs. Total system memory available is 64 Gbytes (four boards fully populated with 1-Gbyte DIMMs).

Within each CPU/Memory board, the 16 DIMM slots are organized into groups of four. The system reads from, or writes to, all four DIMMs in a group simultaneously. DIMMs, therefore, must be added in sets of four.

The figure below shows the DIMM slots and DIMM groups on a Sun Fire V890 CPU/Memory board. Every fourth slot belongs to the same DIMM group. The four groups are designated A0, A1, B0, and B1.



You must physically remove a CPU/Memory board from the system before you can install or remove DIMMs. The DIMMs must be added four-at-a-time within the same DIMM group and be identical—that is, all DIMMs must be from the same manufacturing vendor and must have the same capacity (for example, four 512-Mbyte DIMMs, or four 1-Gbyte DIMMs).

Memory Interleaving

You can maximize the system's memory bandwidth by taking advantage of its memory interleaving capabilities. Sun Fire V890 systems support two-way, four-way, and eight-way memory interleaving. In most cases, higher interleaving factors result in greater system performance. However, actual performance results may vary depending on the system application.

The system's interleaving capabilities are summarized as follows:

- Memory interleaving is limited to memory within the same CPU/Memory board. Memory interleaving between CPU/Memory boards is not supported.
- Eight-way interleaving occurs automatically when all 16 DIMM slots in a CPU/Memory board are filled with identical capacity DIMMs (16 identical DIMMs).
- Four-way interleaving occurs automatically between any two DIMM groups that are configured identically (eight identical capacity DIMMs).
- Two-way interleaving occurs automatically in any DIMM group where the DIMM capacities do not match the capacities used in any other group.

Independent Memory Subsystems

Each Sun Fire V890 CPU/Memory board contains two independent memory subsystems (one per UltraSPARC IV processor). Memory controller logic incorporated into the UltraSPARC IV processor allows each processor to control its own memory subsystem. One processor controls DIMM groups A0 and A1, while the other processor controls DIMM groups B0 and B1.

The Sun Fire V890 system uses a shared memory architecture. During normal system operations, the total system memory is shared by all processors in the system. However, in the event of a processor failure, the two DIMM groups associated with the failed processor become unavailable to all other processors in the system.

The following table shows the association between the CPUs and their corresponding DIMM groups.

| Processor Number | CPU/Memory Slot | Associated DIMM Groups |
|------------------|-----------------|------------------------|
| 0 | Slot A | A0, A1 |
| 2 | Slot A | B0, B1 |
| 1 | Slot B | A0, A1 |
| 3 | Slot B | B0, B1 |

| Processor Number | CPU/Memory Slot | Associated DIMM Groups |
|------------------|-----------------|------------------------|
| 4 | Slot C | A0, A1 |
| 6 | Slot C | B0, B1 |
| 5 | Slot D | A0, A1 |
| 7 | Slot D | B0, B1 |

Configuration Rules

- DIMMs must be added four-at-a-time within the same group of DIMM slots; every fourth slot belongs to the same DIMM group.
- Each group used must have four identical DIMMs installed—that is, all four DIMMs must be from the same manufacturing vendor and must have the same capacity (for example, four 512-Mbyte or four 1-Gbyte DIMMs).
- Each CPU/Memory board must be populated with a minimum of 8 identical DIMMs.



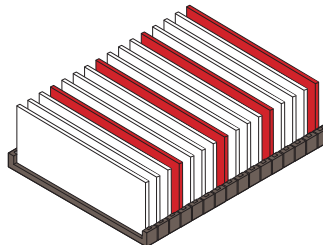
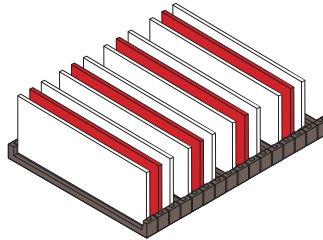
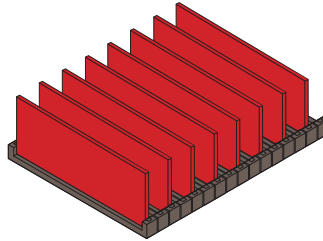
Caution – All internal options (except disk drives and power supplies) must be installed only by qualified service personnel.



Caution – DIMMs are made of electronic components that are extremely sensitive to static electricity. Static from your clothes or work environment can destroy the modules. Do not remove a DIMM from its antistatic packaging until you are ready to install it on the CPU/Memory board. Handle the modules only by their edges. Do not touch the components or any metal parts. Always wear an antistatic grounding strap when you handle the modules. For more information, see “How to Avoid Electrostatic Discharge” on page 26.

The following table summarizes the guidelines for installing DIMMs in a CPU/Memory board. DIMMS must be installed by a qualified service technician.

| Population Sequence | Memory Interleaving Factor |
|--|--|
| <p>Install first eight DIMMs into groups A0 and B0 (so that every other slot is occupied).</p> | <p>Four-way interleaving if all eight DIMMs are identical; two-way interleaving otherwise</p> |
| <p>Install next four DIMMs into group A1.</p> | <p>Four-way interleaving between any two groups configured identically; two-way interleaving in any group that does not match the capacities used in any other group</p> |
| <p>Fill last four available slots (group B1).</p> | <p>Eight-way interleaving if all 16 DIMMs are identical; four-way interleaving between any two groups configured identically; two-way interleaving in any group that does not match the capacities used in any other group</p> |



About PCI Cards and Buses

All system communication with storage peripherals and network interface devices is mediated by two Peripheral Component Interconnect (PCI) bridge chips, located on the system's motherboard. Each bridge chip manages communication between the system's main interconnect bus and two PCI buses, giving the system a total of four separate PCI buses. The four PCI buses support up to nine PCI interface cards and four motherboard devices.

The following table describes the PCI bus characteristics and maps each bus to its associated bridge chip, motherboard devices, and PCI slots. All slots comply with PCI Local Bus Specification Revision 2.1.

| PCI Bridge | PCI Bus | Clock Rate (MHz)/ Bandwidth (bits)/ Voltage (V) | Motherboard Devices | PCI Slots |
|------------|---------|---|---|---|
| 0 | PCI A | 66 MHz/ 64 bits/ 3.3V | Gigabit Ethernet controller FC-AL controller | None. Used for integrated controllers only |
| 0 | PCI B | 33 MHz/ 64 bits/ 5V | SCSI controller (interface to the internal IDE DVD-ROM drive) | Slots 0, 1, 2, 3 |
| 1 | PCI C | 33 or 66 MHz/ 64 bits/ 3.3V | None | Slots 7 and 8 |
| 1 | PCI D | 33 MHz/ 64 bits/ 5V | System controller card, RIO ASIC (Ethernet, USB, and EBus interfaces) | Slots 4, 5, 6 |

The system's PCI hot-plug feature allows you to remove and install PCI cards while the system is running. You can hot-plug any standard PCI card, provided that its Solaris device drivers support PCI hot-plug operations, and the system is running a Solaris Operating System that supports Sun Fire V890 PCI hot-plug operations. In addition, the PCI card must comply with the PCI Hot-Plug Specification Revision 1.1.

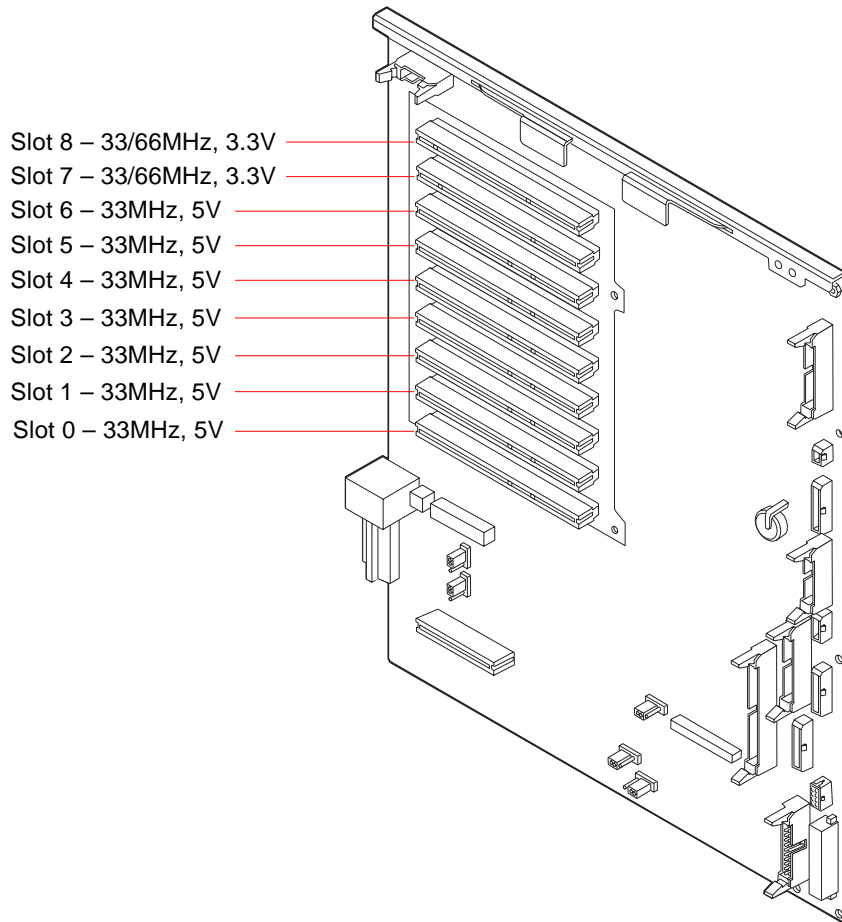
PCI hot-plug procedures may involve software commands for preparing the system prior to removing a card and for reconfiguring the operating system after installing a PCI card. For more information about PCI hot-plug procedures, see "About Hot-Pluggable and Hot-Swappable Components" on page 6.



Caution – Do not attempt to hot-plug a PCI card until you are certain that its device drivers support PCI hot-plug operations; otherwise, you may cause a system panic. For a list of Sun PCI cards and device drivers that support PCI hot-plug operations, see the *Sun Fire V890 Server Product Notes*.

Status LEDs provide power, fault, and hot-plug status indications for each PCI slot. A contact push button is also provided for each slot, which allows you to initiate the hot-plug procedure at the server. For information about the status indicator LEDs, see “About PCI Slot LEDs” on page 265.

The following figure shows the PCI slots on the I/O board.



Configuration Rules

- All slots accept short or long PCI cards.
- 5V PCI cards must be installed into 5V slots. 3.3V PCI cards must be installed into 3.3V slots. All slots accept universal (3.3V/5V) PCI cards.
- All slots accept either 32-bit or 64-bit PCI cards.
- All slots comply with PCI Local Bus Specification Revision 2.1.
- Each slot can supply up to 25 watts of power. The total power used for all nine slots must not exceed 135 watts.
- Compact PCI (cPCI) cards and SBus cards are not supported.
- Slots 7 and 8 can operate at either 33 or 66 MHz; however, both slots always operate at the same speed. When the system is booted, if neither slot contains a 33-MHz PCI card, both slots operate at 66 MHz. If you then add a PCI card to either slot via a hot-plug operation, the card must be a 66-MHz card; a 33-MHz card will fail to operate under these conditions.
- If either slot 7 or 8 contains a 33-MHz PCI card when the system is booted, both slots operate at 33 MHz. In this case, either slot can accept a 33-MHz or 66-MHz card via a hot-plug operation; however, 66-MHz cards will operate at 33 MHz.
- For best performance, install high-throughput cards into slots 7 and 8.

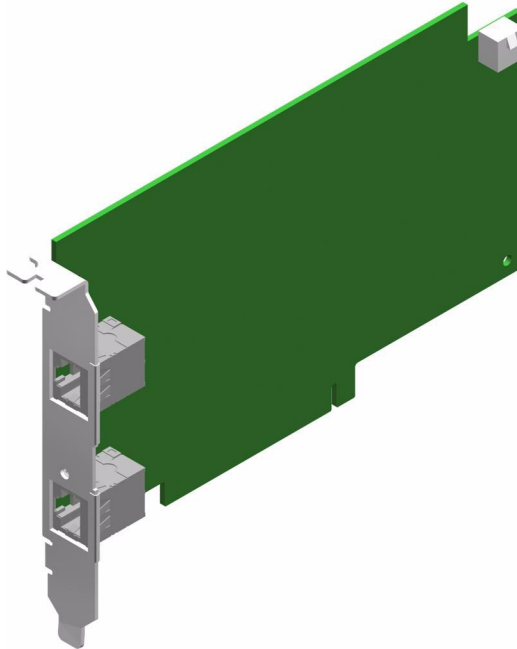
You can improve overall system availability by installing redundant network or storage interfaces on separate PCI buses and PCI bridges. For additional information, see the *Sun Fire V890 Server Owner's Guide*.



Caution – All internal options (except disk drives and power supplies) must be installed only by qualified service personnel.

About the System Controller Card and RSC Software

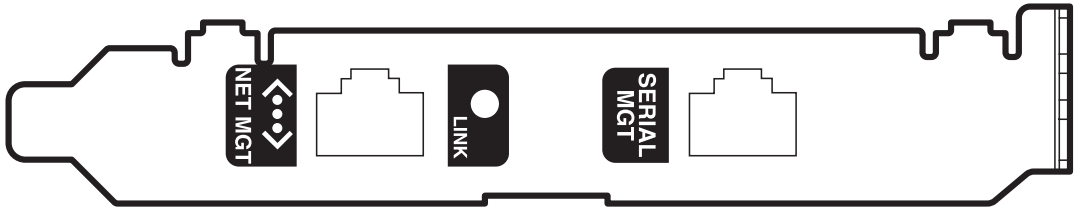
The system controller (SC) card, combined with the Remote System Control (RSC) software, enables access, monitoring, and control of the Sun Fire V890 server from a remote location. It is a fully independent processor card with its own resident firmware, power-on self-test (POST) diagnostics, and real-time operating system. The card features serial and Ethernet interfaces that provide simultaneous access to the Sun Fire V890 server for multiple RSC users. RSC users are provided secure access to the system's Solaris and OpenBoot console functions and have full control over POST and OpenBoot Diagnostics.



The system controller card runs independently of the host server, and operates on 5-volt standby power from the system's power supplies. The card features on-board devices that interface with the system's environmental monitoring subsystem and can automatically alert administrators to system problems. Together these features allow the system controller card and RSC software to serve as a "lights-out" management tool that continues to function even when the server operating system goes offline or the system is powered off.

The system controller card plugs in to a dedicated slot on the system I/O board and provides the following ports through an opening in the system rear panel:

- 10-Mbps Ethernet port via an RJ-45 twisted-pair Ethernet (TPE) connector
- EIA-232D serial port via an RJ-45 connector



The two system controller ports can be used simultaneously.

Note – You must install the Solaris Operating System and the Sun Remote System Control software prior to setting up an RSC console. For more information, see the *Sun Fire V890 Server Owner's Guide*.

Once you install the operating system and the RSC software, you can then configure the system to use RSC as the system console. For detailed instructions, see the *Sun Fire V890 Server Owner's Guide*.

Configuration Rules

You can install the system controller card into a dedicated slot at the base of the system I/O board. Never move the system controller card to another system slot, as it is *not* a PCI-compatible card.

Note – The system controller card is *not* a hot-pluggable component. Before installing or removing a system controller card, you must power off the system and disconnect all system power cords.

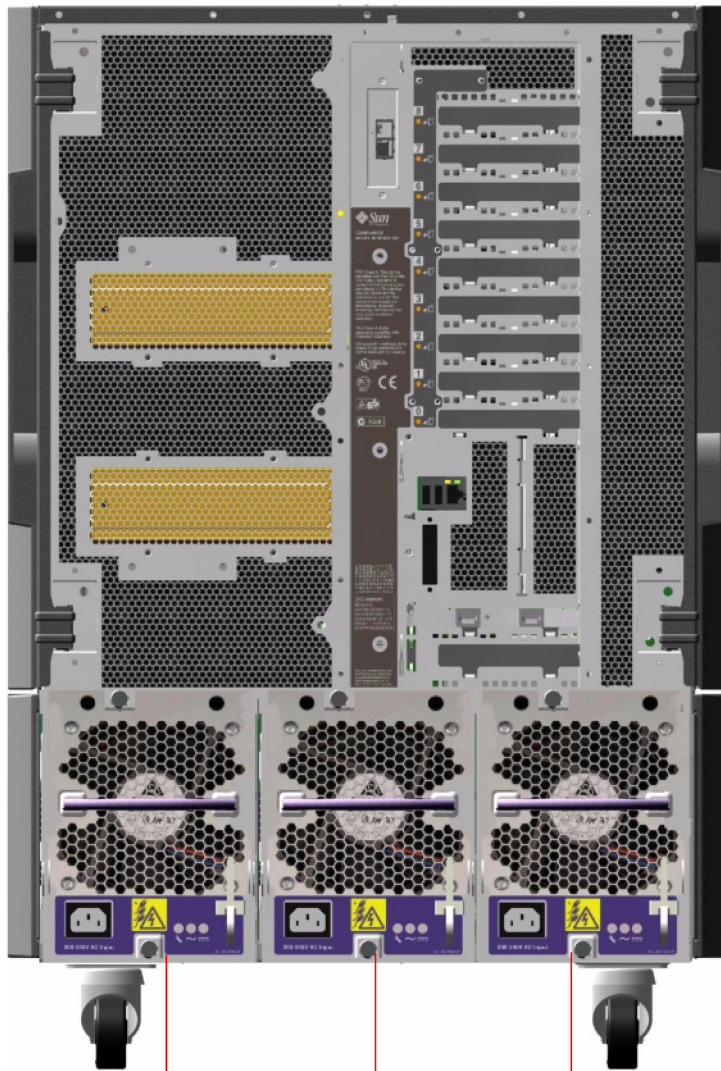


Caution – All internal options (except disk drives and power supplies) must be installed only by qualified service personnel.

About Power Supplies

A central power distribution board delivers DC power to all internal system components. The system's power supplies plug in to connectors on this board, and all of the supplies installed share equally in satisfying the power demands of the system.

Sun Fire V890 power supplies are modular units, designed for fast, easy installation or removal, even while the system is fully operational. Power supplies are installed in bays at the rear of the system, as shown in the following figure.



Power supply 2

Power supply 1

Power supply 0

The system can accommodate a maximum of three power supplies, each with its own 10-amp AC power cord. Each power supply provides up to 1629 watts of DC power at 200-240 VAC line input. The basic system configuration comes with three power supplies installed. The third power supply provides N+1 power redundancy, allowing the system to continue operating should any one of the power supplies fail.

Each power supply provides a total of five DC output voltages (3.3V, 5.0V, 12V, 48V, and 5.0V standby). Output current is shared equally between each of the supplies via active current sharing circuitry.

Power supplies in a redundant configuration feature a hot-swap capability. You can remove and replace a faulty power supply without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.

Each power supply has three status LEDs to provide power and fault status information. For additional details, see “About Power Supply LEDs” on page 267.

Configuration Rules

- Sun Microsystems recommends that you connect each power supply to a dedicated AC circuit. Consult your local electrical codes for any additional requirements.
- The minimum system configuration requires two power supplies. The basic system configuration comes with three power supplies installed. Systems configured with only one power supply are not supported
- A system configured with two power supplies may shut down abruptly if either power supply fails. The third power supply enables the system to remain fully operational should any one of the power supplies fail.
- Power supply bays 0 and 1 must always contain power supplies. If a power supply in either bay fails and the system can continue to operate, you must leave the failed power supply in its bay until you are able to install a functioning replacement power supply. A failed power supply in bay 0 or 1 still acts as an air baffle, channeling airflow to cool the bottom row of disk drives in the disk cage. The failed power supply should be replaced as soon as possible to regain N+1 power redundancy.



Caution – If any power supply fails, leave the supply in its bay until you are ready to install a replacement.

For information about installing power supplies, see “How to Install a Power Supply” on page 160.

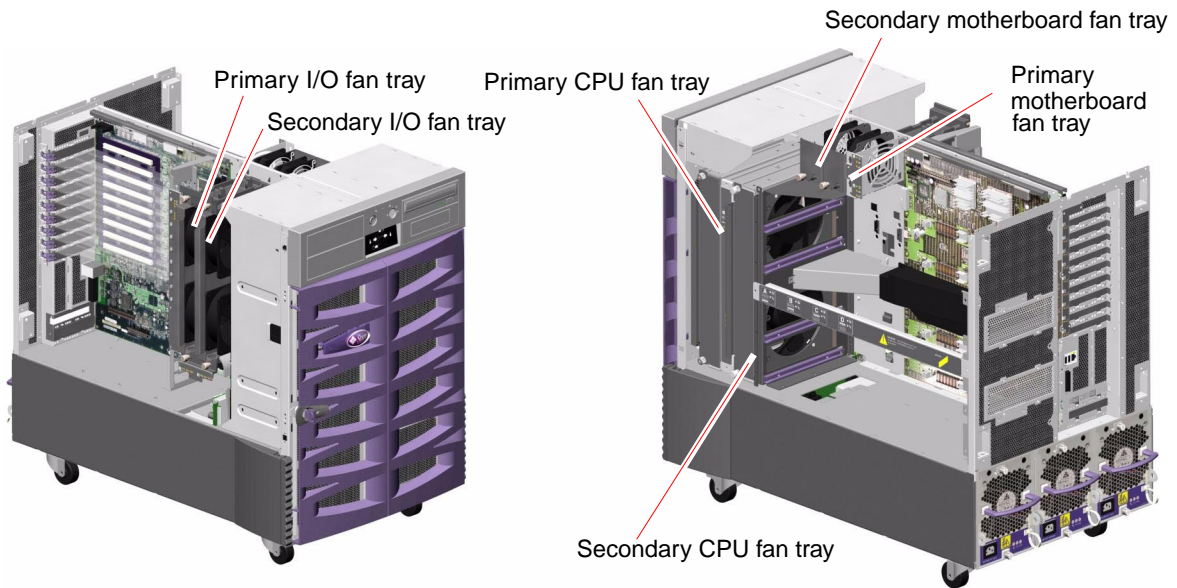
About Fan Trays

The basic system is equipped with three fan trays: a CPU fan tray, an I/O fan tray, and a motherboard fan tray. The CPU and I/O fan trays contain two fans apiece, while the motherboard fan tray contains a single fan. All systems are equipped with this primary set of fan trays and redundant cooling from a secondary set of the same fan trays.

The motherboard fan tray is also known as the I/O bridge fan tray since its primary purpose is to cool the I/O bridge chips on the system motherboard.

The following table describes the system's fan trays.

| Fan(s) | Bay | Description |
|--------------------------------|-----|-----------------------------------|
| Primary CPU fan tray | 1 | One fan tray with two 6-inch fans |
| Secondary CPU fan tray | 2 | One fan tray with two 6-inch fans |
| Primary I/O fan tray | 3 | One fan tray with two 4-inch fans |
| Secondary I/O fan tray | 4 | One fan tray with two 4-inch fans |
| Primary motherboard fan tray | 5 | One 3-inch fan |
| Secondary motherboard fan tray | 6 | One 3-inch fan |



Only the primary fan trays are running during normal system operation. If a primary fan tray fails, the environmental monitoring subsystem detects the failure and automatically activates the secondary fan tray.

All fan trays feature a hot-swap capability. You can remove and replace a faulty fan tray without shutting down the operating system or turning off the system power. For additional details, see “About Hot-Pluggable and Hot-Swappable Components” on page 6.

For each fan in the system, the environmental monitoring subsystem monitors or controls the following:

- Fan present (monitored)
- Fan speed in revolutions per minute (RPM) (monitored) – Used to detect early fan degradation
- Fan power input (controlled) – Used to increase or decrease the airflow and cooling capacity
- Fan fault LEDs (controlled)

Only the primary CPU fans have variable speed control. The secondary CPU fans, the primary and secondary motherboard fans, and the primary and secondary I/O fans can only be turned fully on or fully off. Fan speed is controlled by the environmental monitoring subsystem in response to temperature conditions inside the system. For additional details, see the *Sun Fire V890 Server Owner's Guide*.

Status indicator LEDs provide power, fault, and hot-swap indications for each fan tray. For information about the status indicator LEDs, see “About Fan Tray LEDs” on page 268.

Configuration Rules

- The minimum system configuration requires a complete set of three working fan trays—an I/O fan tray, a CPU fan tray, and a motherboard fan tray.
- If the system does not include a secondary CPU fan tray, a CPU fan tray filler panel must be installed in its place.



Caution – All internal options (except disk drives and power supplies) must be installed only by qualified service personnel.



Caution – A complete set of three working fan trays must be present in the system at all times. After removing a fan tray, if the system is left with fewer than three working fan trays, you must install a replacement fan tray immediately to avoid an automatic thermal shutdown. For more information, see the *Sun Fire V890 Server Owner's Guide*.

About Removable Media Devices

The Sun Fire V890 system provides front-panel access to three mounting bays. One bay houses an IDE DVD-ROM drive, which comes standard in all system configurations. The other two bays can house optional wide (68-pin) SCSI removable devices, which must be ordered separately. The tape drive option also requires a SCSI cable and a SCSI adapter card; both must be ordered separately. You can easily convert the two SCSI device bays into a single full-height bay by removing a metal shelf divider.

The SCSI bus that supports the removable media devices is Fast/Wide-capable (20 Mbytes per second) and can support single-ended, wide or narrow SCSI devices.

Target addresses (also know as SCSI IDs) for the SCSI bus are available in the ranges of 0 through 5 and 8 through 15.

The target address reserved for the optional tape drive is 5.

If no tape drive is installed, you can use this address for an external device. If you later install an internal tape drive, you must use 5 as its address and assign a different address to the external device.



Caution – All internal options (except disk drives and power supplies) must be installed only by qualified service personnel.

About Serial Ports

The system provides two serial communication ports through a single, shared DB-25 connector located on the rear panel. The primary port is capable of both synchronous and asynchronous communication, while the secondary port is asynchronous only. In synchronous mode, the primary port operates at any rate from 50 Kbaud to 256 Kbaud when the clock is generated internally. When the clock is generated from an external source, the synchronous port operates at rates up to 384 Kbaud. In asynchronous mode, either port supports baud rates of 50, 75, 110, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200, 153600, 230400, 307200, and 460800.

The primary port is accessible by connecting a standard serial cable to the rear panel serial port connector. To access the secondary port, you must attach a serial port splitter cable (Sun part number X985A) to the rear panel serial port connector. The connector labeled "A" on the splitter cable provides the primary port; the connector labeled "B" provides the secondary port.

You can configure both serial ports to comply with the Electronics Industries Association EIA-423 or EIA-232D standards using jumpers located on the system's I/O board. The jumpers are factory-set for the EIA-423 standard, which is the default standard for North American users. Compliance with the EIA-232D standard is required for digital telecommunication in nations of the European Community. For more information about configuring the serial port jumpers, see "About Serial Port Jumpers" on page 242.

See "Reference for the Serial Port A and B Connectors" on page 300 for the connector diagram, rear panel icon, and pin assignments.

About USB Ports

The system's rear panel provides two Universal Serial Bus (USB) ports for connection to USB peripheral devices such as:

- Sun Type-6 USB keyboard
- Sun USB three-button mouse
- Modems
- Printers
- Scanners
- Digital cameras

For USB port locations, see "Locating Rear Panel Features" on page 25.

Note – For Sun Fire V890 servers, you must order the keyboard and mouse as options. If the version of your Sun Type-6 keyboard does not have an integrated USB hub, the keyboard and mouse will consume both USB ports on the system rear panel. If you need to connect additional USB devices, you must add a USB hub.

The USB ports are compliant with the Open Host Controller Interface (Open HCI) specification for USB Revision 1.0. Both ports support isochronous and asynchronous modes and enable data transmission at speeds of 1.5 Mbps and 12 Mbps. Note that the USB data transmission speed is significantly faster than that of the standard serial ports, which operate at a maximum rate of 460 Kbaud.

The USB ports are accessible by connecting a USB cable to either rear panel USB connector. The connectors at each end of a USB cable are different, so you cannot connect them incorrectly. One connector plugs in to the system or USB hub; the other plugs in to the peripheral device. Up to 126 USB devices can be connected to the bus simultaneously, through the use of USB hubs.

Note – The Universal Serial Bus provides power for smaller USB devices such as modems. Larger USB devices, such as scanners, require their own power source.

Both USB ports support hot-plugging. You can connect and disconnect the USB cable and peripheral devices while the system is running, without affecting system operations.

Note – You can only perform USB hot-plug operations while the operating system is running. USB hot-plug operations are not supported when the system ok prompt is displayed.

About Hardware Jumpers

The hardware jumpers in the Sun Fire V890 server have the following functions:

- J2902 and J2903 on the system I/O board are used to configure the serial ports for either EIA-423 or EIA-232D operation. For information about the EIA-423 and EIA-232D jumper settings, see “About Serial Port Jumpers” on page 242.
- J3002, J3003, and J3004 are used to affect the operation of the OpenBoot flash PROM located on the system I/O board. See “About Flash PROM Jumpers” on page 243.
- J01701, J01003, and J0803 are used to affect the operation of the flash PROM located on the FC-AL disk backplane. See “About Flash PROM Jumpers” on page 243.

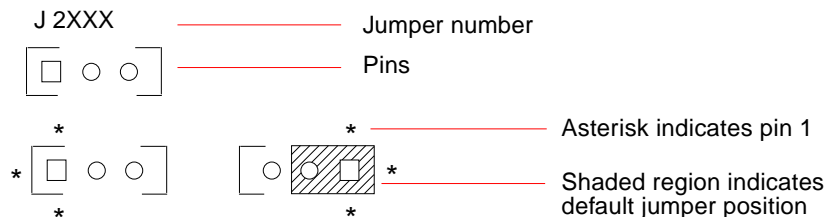


Caution – All internal jumper modifications must be performed only by qualified service personnel.



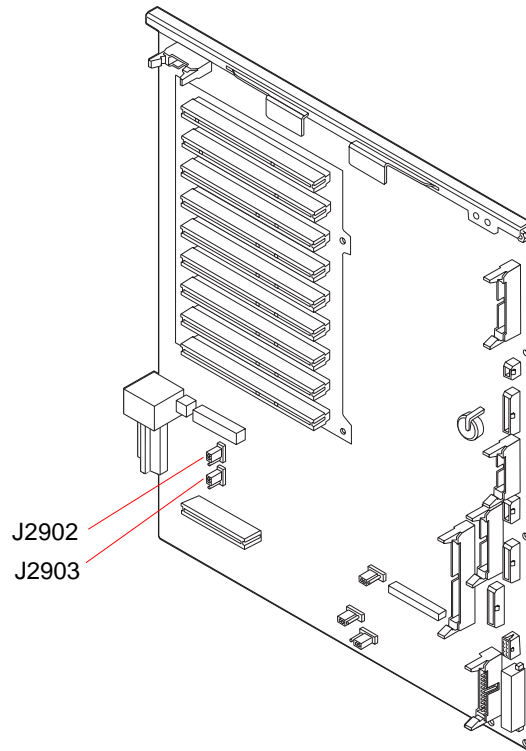
Caution – Do not change the configuration of J0501 and J0502 on the system controller card from the default settings; otherwise, the system controller card will not boot.



All jumpers are marked with identification numbers. For example, the serial port jumpers on the system I/O board are marked J2902 and J2903. Jumper pins are located immediately adjacent to the identification number. The default jumper positions are indicated with shaded regions. Pin 1 is marked with an asterisk (*) in any of the positions shown below.



About Serial Port Jumpers

The serial port jumpers (J2902 and J2903) on the system I/O board configure the system's two serial ports for either EIA-423 or EIA-232D signal levels. EIA-423 levels are the default standard for North American users. EIA-232D levels are required for digital telecommunication in nations of the European Community.



| Jumper | Shunt on Pins 1 + 2 Selects | Shunt on Pins 2 + 3 Selects | Default Setting |
|---|-----------------------------|-----------------------------|-----------------|
| J2902  | EIA-232D | EIA-423 | 2 + 3 |
| J2903  | EIA-232D | EIA-423 | 2 + 3 |

About Flash PROM Jumpers

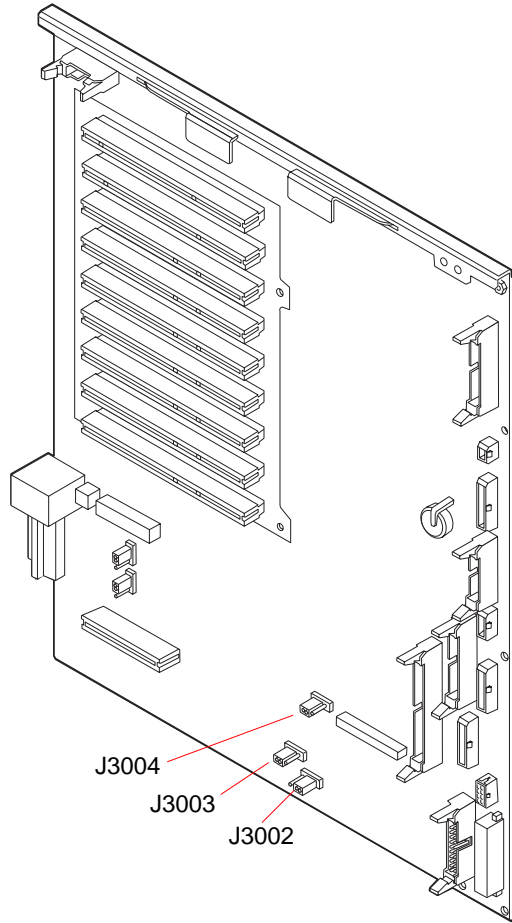
The Sun Fire V890 system uses flash PROMs to enable the reprogramming of specific firmware code blocks held in nonvolatile system memory, and to enable remote reprogramming of that code by an authorized system administrator over a local area network. Firmware updates, when required, are available for download from the SunSolve OnlineSM web site at: <http://sunsolve.sun.com>.




Instructions for performing a firmware update procedure are provided with the downloaded firmware image.

Several jumpers located on the system I/O board and FC-AL disk backplane affect flash PROM operation. The jumper locations and settings are provided in the sections that follow. For an explanation of how each jumper affects the flash PROM update procedure, see the instructions supplied with the firmware image.

System I/O Board

The locations and functions of the flash PROM jumpers on the system I/O board are shown below.

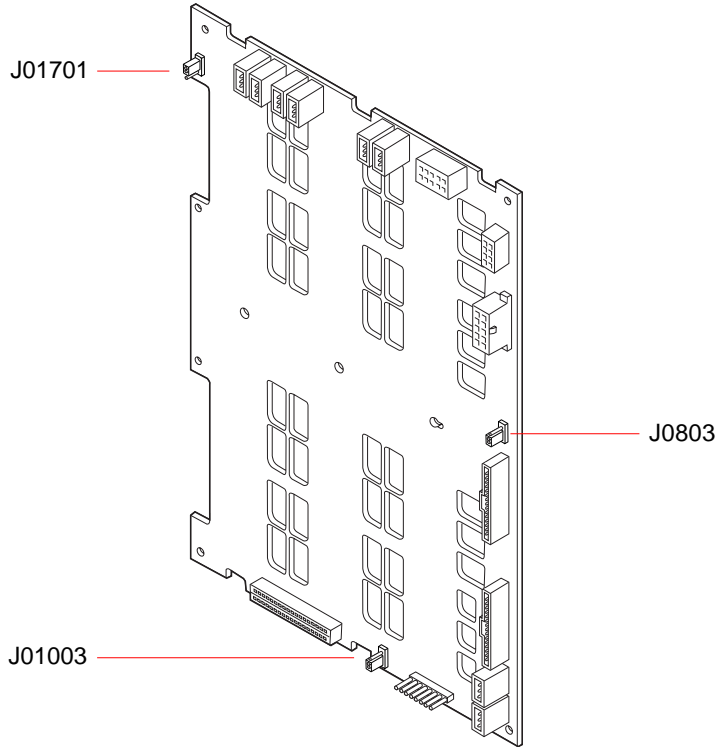





| Jumper | Shunt on Pins 1 + 2 Selects | Shunt on Pins 2 + 3 Selects | Default Setting |
|---|-----------------------------|-----------------------------|-----------------|
| J3004  | OpenBoot flash PROM | For factory use only | 1 + 2 |
| J3003  | Write-protect | Write-enable | 2 + 3 |
| J3002  | High half booting | Normal booting | 2 + 3 |

Note – Jumper J3003 is factory-set so that the flash PROM is write-enabled. You use the keyswitch located on the front panel to write-protect the flash PROM. When the switch is set to the Locked position, the flash PROM is write-protected. When the switch is set to the Normal position or to the Diagnostics position, the flash PROM is write-enabled.

FC-AL Disk Backplane

The locations and functions of the flash PROM jumpers on the Fibre Channel-Arbitrated Loop (FC-AL) disk backplane are shown below.



| Jumper | Shunt on Pins 1 + 2 Selects | Shunt on Pins 2 + 3 Selects | Default Setting |
|--------|--|-----------------------------|-----------------|
| J01701 |  High half booting, Loop B | Normal booting, Loop B | 2 + 3 |
| J0803 |  High half booting, Loop A | Normal booting, Loop A | 2 + 3 |
| J01003 |  Flash PROM | For factory use only | 1 + 2 |

Illustrated Parts Breakdown

This appendix consists of a sequence of illustrations that show how the various pieces of the system fit together. Part numbers are also provided.

Part Numbers

The following items for the Sun Fire V890 server can be replaced at the customer site by a qualified service provider.

Note – The part numbers listed in this section are correct as of the manual publication date but are subject to change without notice. Consult your authorized Sun sales representative or service provider to confirm a part number prior to ordering a replacement part.

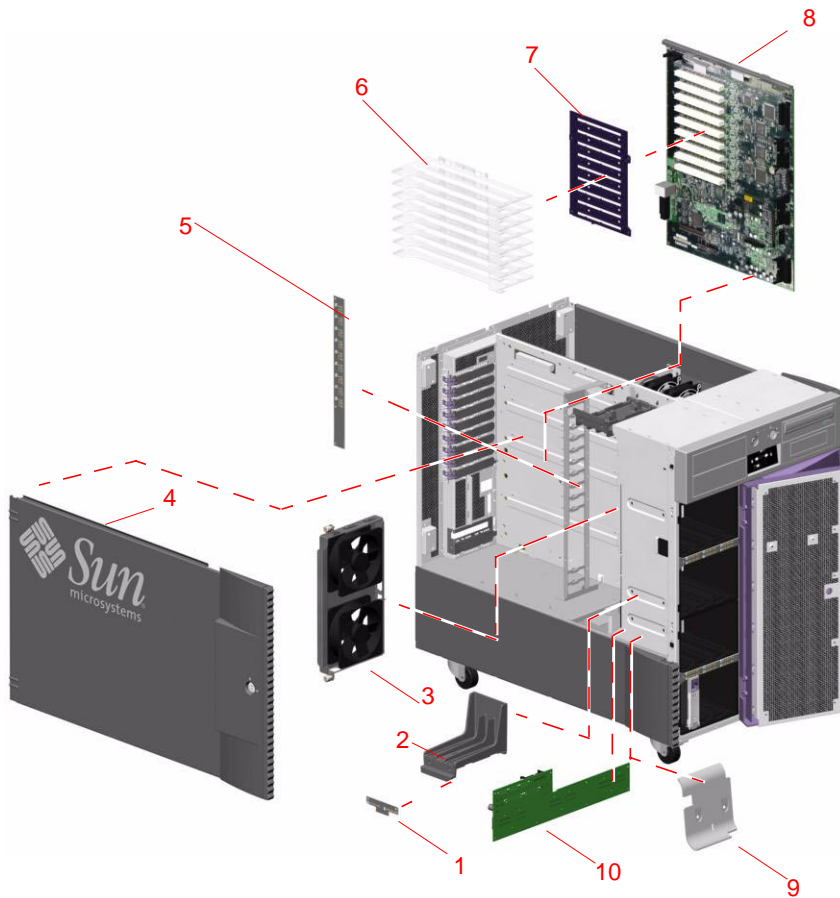
| Category | Part | Part Number |
|--|----------------------------|---|
| Motherboard and Components | Motherboard | 501-6771 |
| | 1200 MHz CPU/Memory Board | 501-6636 |
| | | 501-6848 |
| | 512 MB DIMM | 501-5030 |
| | 1 GB DIMM | 501-6109 |
| I/O Board and Components | I/O Board | 501-6737 |
| | System Controller Card | 501-6767 |
| | System ID PROM | Not a FRU |
| Power | Power Supply | 300-1622 |
| | Power Distribution Board | 375-3173 |
| FC-AL Disk Backplane | FC-AL Disk Backplane | 501-6759 |
| Storage and Removable Media Devices | 12/24 DDS3 Tape Drive | 370-2376 |
| | 20/40 DDS4 Tape Drive | 390-0028 |
| | 18 GB 10K FC-AL Disk Drive | Not supported in the Sun Fire V890 Server |
| | 36 GB 10K FC-AL Disk Drive | 540-4525 |

| Category | Part | Part Number |
|--|-------------------------------------|----------------------|
| | 72 GB 10K FC-AL Disk Drive | 540-4905 |
| | | 540-4508 |
| | DVD-ROM Drive | 390-0025 |
| Fan Trays | CPU Fan Tray | 541-0134 |
| | Motherboard Fan Tray | 540-4025 |
| | I/O Fan Tray | 540-3615 |
| Status Assemblies and Flex Circuits | System Status Assembly | 540-3694 |
| | CPU Fan Status Assembly | 540-4453 |
| | CPU/Memory Board Status Assembly | 540-4454 |
| | Motherboard Fan Status Flex Circuit | 370-3960 |
| | I/O Fan LED Flex Circuit | 370-3962 |
| | PCI External LED Flex Circuit | 370-3963 |
| | PCI Internal LED Flex Circuit | 370-3964 |
| | Upper Disk LED Flex Circuit | 370-3958 (Not a FRU) |
| | Lower Disk LED Flex Circuit | 370-3957 (Not a FRU) |
| Cables | RME Power Cable | 530-2548 |
| | Atapi DVD Cable | 530-3298 |
| | Wide-to-Narrow SCSI Adapter | 595-6013 |
| | I/O Board Remote Sense Cable | 530-2745 |
| | I/O Signal Cable | 530-2746 |
| | Motherboard Power Cable | 530-3285 |
| | I/O Board Power Cable | 530-2818 |
| | I ² C Cable | 530-2840 |
| | Base Backplane Power Cable | 530-2841 |
| | Base/Expansion Cable | 530-2863 |
| | FC-AL Data Cable (short) | 530-2621 |
| | FC-AL Data Cable (medium) | 530-2622 |
| | FC-AL Data Cable (long) | 530-2623 |
| | PCI Internal Status Cable | 530-2835 |

| Category | Part | Part Number |
|----------------------|--|----------------------|
| | PCI External Status Cable | 530-2836 |
| | System Status Assembly Cable | 530-2839 |
| | Fan Power Cable | 530-2747 |
| | CPU/Memory Board Status Assembly Cable | 530-2837 |
| | Fan Status Cable | 530-2838 |
| Filler Panels | FC-AL Backplane Filler Panel | 340-4895 (Not a FRU) |
| | 3.5-inch RMA Metal Filler Panel | 340-5934 (Not a FRU) |
| | 5.25-inch RMA Metal Filler Panel | 340-5933 (Not a FRU) |
| | 3.5-inch RMA Plastic Filler Panel | 330-2400 (Not a FRU) |
| | 5.25-inch RMA Plastic Filler Panel | 330-2399 (Not a FRU) |
| | PCI Filler Panel | 340-6627 (Not a FRU) |

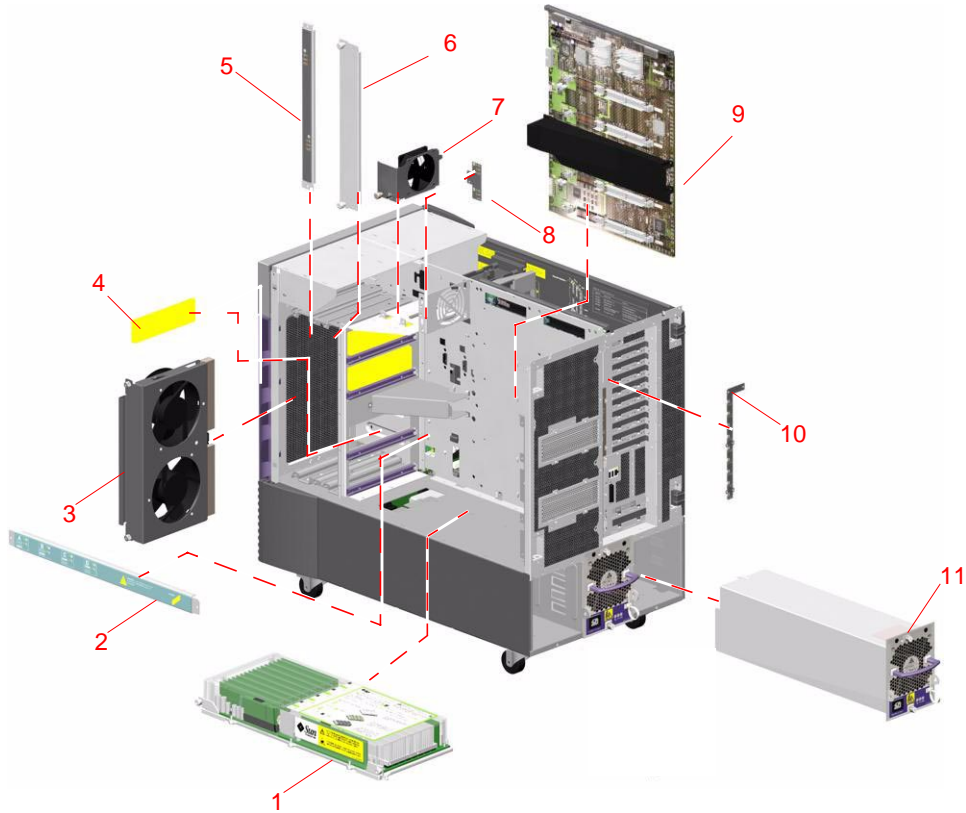
Assembly Illustrations

I/O Side Components



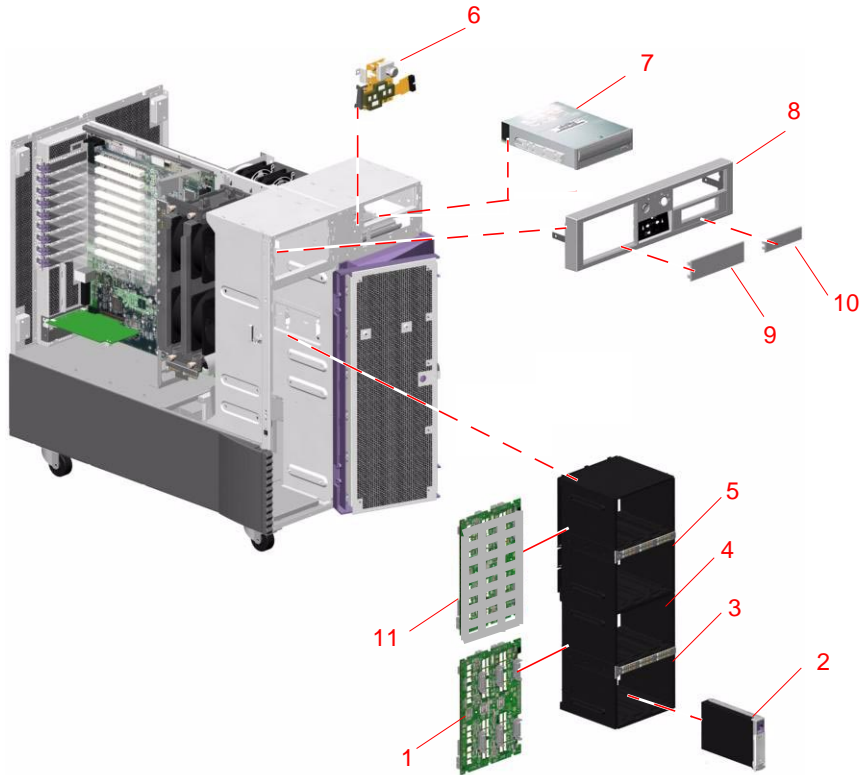
| Key | Description | Part Number |
|------------|-------------------------------|--------------------|
| 1 | I/O Fan LED Flex Circuit | 370-3962 |
| 2 | I/O Fan Bracket | Not a FRU |
| 3 | I/O Fan Tray | 540-3615 |
| 4 | Side Door | Not a FRU |
| 5 | PCI Internal LED Flex Circuit | 370-3964 |
| 6 | PCI Dividers | Not a FRU |
| 7 | PCI Divider Holder | Not a FRU |
| 8 | I/O Board | 501-6737 |
| 9 | I/O Air Guide | Not a FRU |
| 10 | Power Distribution Board | 375-3173 |

CPU Side Components



| Key | Description | Part Number |
|------------|-------------------------------------|--------------------|
| 1 | CPU/Memory Board | 501-6636 |
| 2 | CPU/Memory Board Status Assembly | 541-0126 |
| 3 | CPU Fan Tray | 541-0134 |
| 4 | CPU/Memory Board Air Baffle | 540-4431 |
| 5 | CPU Fan Status Assembly | 540-4453 |
| 6 | CPU Fan Filler Panel | 330-3838 |
| 7 | Motherboard Fan Tray | 540-4025 |
| 8 | Motherboard Fan Status Flex Circuit | 370-3960 |
| 9 | Motherboard | 501-4300 |
| 10 | PCI External LED Flex Circuit | 370-3963 |
| 11 | Power Supply | 300-1622 |

Front Side Components



| Key | Description | Part Number |
|-------------|------------------------------------|--------------------|
| 1 | FC-AL Backplane | 501-5993 |
| 2 | 36 GB 10K FC-AL Disk Drive | 540-4525 |
| 3 | Lower Disk LED Flex Circuit | 370-3957 |
| 4 | Disk Cage | Not a FRU |
| 5 | Upper Disk LED Flex Circuit | 370-3958 |
| 6 | System Status Assembly | 540-3964 |
| 7 | DVD-ROM Drive | 390-0161 |
| 8 | RMA Bezel | 540-4167 |
| 9 | 3.5-inch RMA Plastic Filler Panel | 330-2400 |
| 10 | 5.25-inch RMA Plastic Filler Panel | 330-2399 |
| 11 | FC-AL Backplane Filler Panel | 340-4895 |
| (not shown) | 3.5-inch RMA Metal Filler Panel | 340-5934 |
| (not shown) | 5.25-inch RMA Metal Filler Panel | 340-5933 |

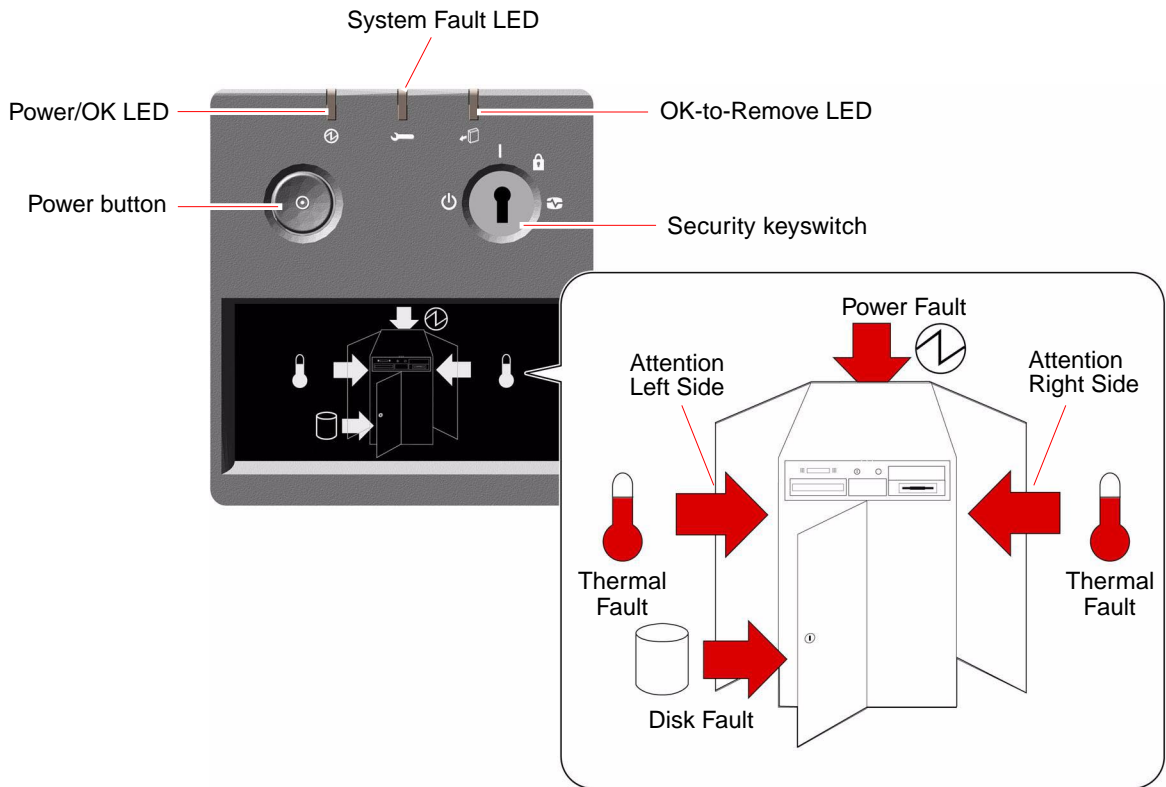
System LEDs

This appendix gives you reference information about the LEDs on the Sun Fire V890 server. Topics covered in this appendix include:

- “About Front Panel LEDs” on page 261
- “About CPU/Memory Slot LEDs” on page 264
- “About PCI Slot LEDs” on page 265
- “About Power Supply LEDs” on page 267
- “About Fan Tray LEDs” on page 268
- “About Disk Drive LEDs” on page 269
- “About Gigabit Ethernet LEDs” on page 272

About Front Panel LEDs

The system status and control panel includes several LED status indicators, a Power button, and a security keyswitch. The following figure shows the status and control panel.











Several LED status indicators provide general system status, alert you to system problems, and help you to determine the location of system faults.

- At the top of the status and control panel, three general status LEDs provide a snapshot of the system status.
- Below the Power button and security keyswitch, a graphical display provides additional LED icons to indicate specific fault conditions and locations.

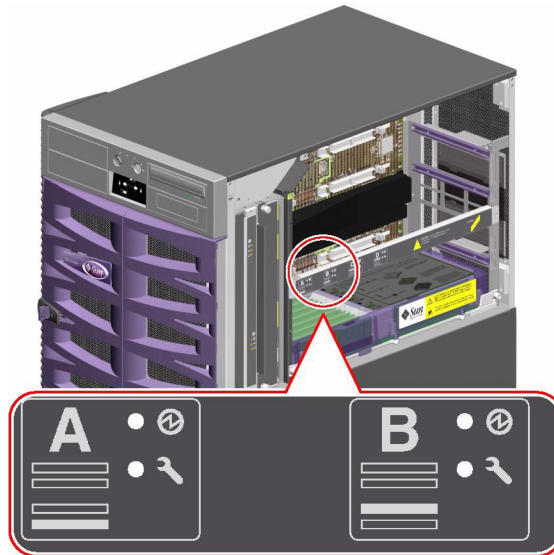
The general status LEDs work in conjunction with the specific fault LED icons. For example, a fault in the disk subsystem illuminates both the system Fault LED at the top of the panel and the Disk Fault icon in the graphical display below it. Fault LEDs within the enclosure help pinpoint the location of the faulty device. Since all front panel status LEDs are powered by the system's 5-volt standby power source, fault LEDs remain lit for any fault condition that results in a system shutdown.

During system startup, the front panel LEDs are individually toggled on and off to verify that each one is working correctly. After that, the front panel LEDs operate as described in the following table.

| Name | Icon | LED Function |
|----------------------|---|--|
| Power/OK |  | This green LED lights when the system power is on. |
| System Fault |  | This amber LED lights to indicate a serious system fault. When this LED is lit, one or more icons in the display panel may also light to indicate the specific nature and location of the fault. |
| OK-to-Remove |  | This amber LED lights to indicate that an internal hot-pluggable component is ready for removal. |
| Disk Fault |  | This amber LED lights to indicate a serious disk subsystem fault that is likely to bring down the system. When this LED is lit, one or more disk LEDs may also be lit at the front of the disk cage, indicating the source of the fault. See “About Disk Drive LEDs” on page 269. |
| Power Fault |  | This amber LED lights to indicate a serious power subsystem fault that is likely to bring down the system. When this LED is lit, one or more power supply LEDs may also be lit on the system rear panel. See “About Power Supply LEDs” on page 267. |
| Thermal Fault |  | This amber LED lights to indicate a serious thermal fault (fan fault or overtemperature condition) that is likely to bring down the system. There are two Thermal Fault LEDs in the display to indicate whether the fault is located on the left or right side of the system. In the event of a fan fault, a fault LED inside the system will indicate the faulty fan assembly. See “About Fan Tray LEDs” on page 268. |
| Attention Left Side |  | This amber LED lights to indicate that an internal component on the left side of the system requires servicing. |
| Attention Right Side |  | This amber LED lights to indicate that an internal component on the right side of the system requires servicing. |

About CPU/Memory Slot LEDs

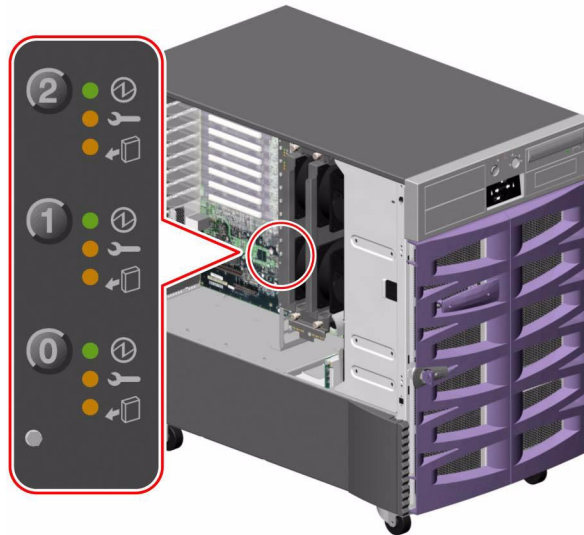
The CPU/Memory slot LEDs are located on the horizontal panel between CPU/Memory slots B and C and are visible when the right side door is open. There are two LEDs for each CPU/Memory slot, as shown below.



| Icon | Name | LED Function |
|------|----------|--|
| | Power On | Lights when the slot is receiving power. |
| | Fault | Reserved for future use. |




About PCI Slot LEDs

The PCI slot LEDs are located on the vertical bracket on the right side of the PCI slots and are visible when the left side door is open. There are three LEDs for each PCI slot, as shown below.



| Icon | Name | LED Function |
|------|--------------|---|
| | Power On | Lights when the slot is receiving power. |
| | Fault | Blinks while the card is being tested, when a hot-plug operation is in progress, or when the card is powered on but logically detached from the operating system. |
| | | Stays lit if the card encounters a fault. |
| | OK-to-Remove | Lights when it is safe to remove the card. |

The following table shows how to interpret the various possible LED patterns.

|  |  |  | Interpretation |
|---|---|---|--|
| Off | Off | Off | The slot power is off. A PCI card can be safely inserted to start a hot-plug operation. |
| On | Blinking | Off | The installed card is being tested, configured, or deconfigured, or the card is powered on but logically detached from the operating system. |
| On | Off | Off | The slot power is on and the PCI card is operating normally. |
| Off | On | On | The PCI card has encountered a fault. The card can be safely removed. |
| Off | Off | On | The card can be safely removed. |

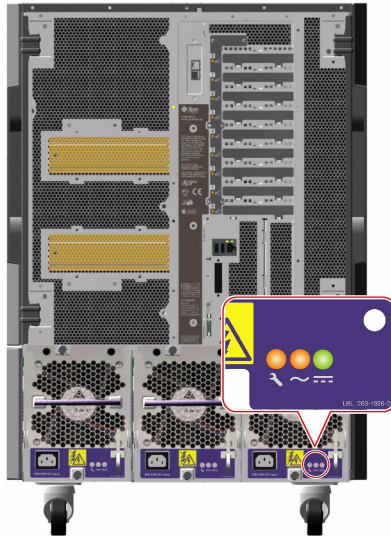
Note – If the slot is empty and the Fault or OK-to-Remove LED is on, pressing the contact push button for the slot will clear the LED.




For more information about PCI cards and hot-plug operations, see:

- “About PCI Cards and Buses” on page 226
- “About Hot-Pluggable and Hot-Swappable Components” on page 6

About Power Supply LEDs

There are three LEDs located on the rear of each power supply, as shown below.

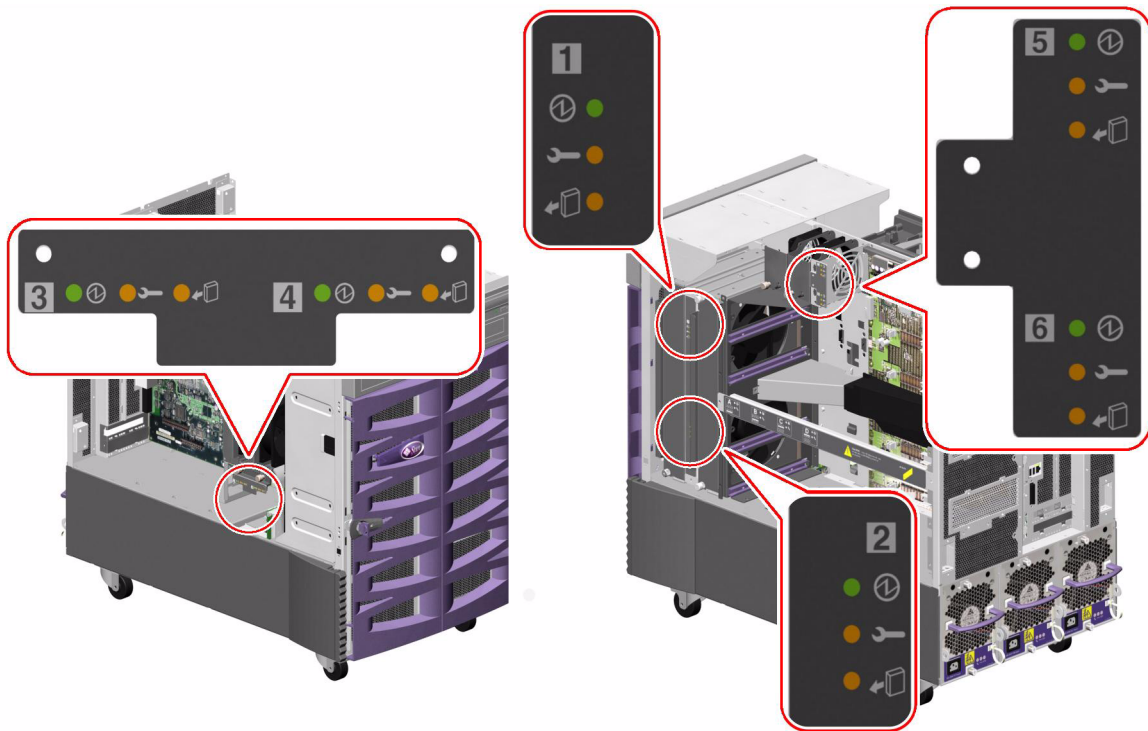


| Icon | Name | LED Function |
|---|-------------------|---|
|  | Fault | Lights when the power supply encounters a fault. |
|  | AC-Present Status | Lights when AC power input is present and within acceptable operating limits. |
|  | DC Status | Lights when all DC outputs are functional and within acceptable operating limits. |

About Fan Tray LEDs




The Thermal Fault LED on the system status and control panel indicates the overall status of the cooling system. The Thermal Fault LED lights when a fan fault or overtemperature condition is detected. LEDs inside the system indicate the fault status of each fan tray assembly.

The fan tray LEDs are located beside or beneath each fan tray assembly. There are three LEDs per fan tray, as shown below.



| Icon | Name | LED Function |
|------|--------------|--|
| | Power On | Lights when the fan tray is receiving power. |
| | Fault | Lights when the fan tray encounters a fault. |
| | OK-to-Remove | Lights when it is safe to remove the fan tray assembly from a powered-on system (only when redundant fan trays are present). |

The following table shows how to interpret the various possible LED patterns.

|  |  |  | Interpretation |
|---|---|---|--|
| Off | Off | Off | The fan tray is not receiving power or is improperly inserted. |
| On | Off | Off | The fan tray is receiving power and operating normally. |
| Off | On | On | The fan tray has encountered a fault and can be safely removed from a powered-on system. |

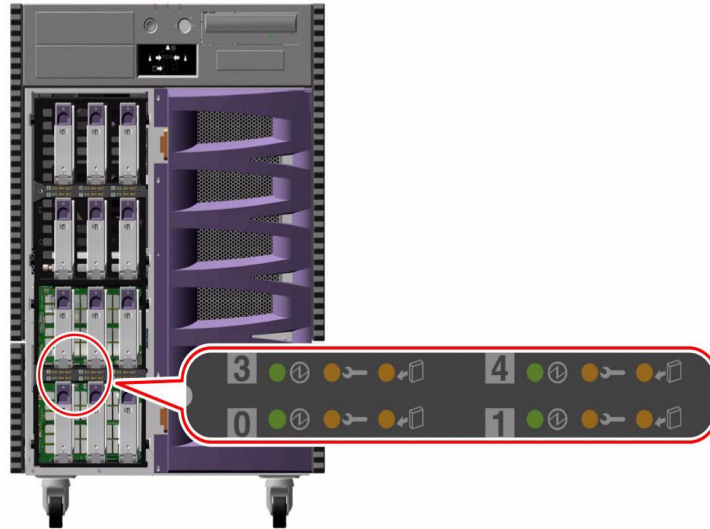
For more information about fan trays and hot-plug operations, see:




- “About Fan Trays” on page 235
- “About Hot-Pluggable and Hot-Swappable Components” on page 6

About Disk Drive LEDs




The Disk Fault LED on the system status and control panel indicates the general status of the disk subsystem. The Disk Fault LED lights when a fault is detected in the disk subsystem. LEDs inside the system indicate the fault status of individual disk drives.

There are three LEDs for each disk drive. The disk drive LEDs are located on the front of the disk cage, as shown below.



| Icon | Name | LED Function |
|---|--------------|---|
|  | Activity | Blinks slowly while the disk drive is being tested, configured, or deconfigured during a hot-plug operation. Blinks rapidly as the disk drive spins up or spins down. Stays lit when the disk drive is at speed and operating normally but experiencing no read or write activity. Blinks rapidly and irregularly in response to disk read or write activity. |
|  | Fault | Lights when the disk drive encounters a fault. |
|  | OK-to-Remove | Lights when it is safe to remove the disk drive during a hot-plug operation. Blinks (under software control) to direct attention to a disk drive. |

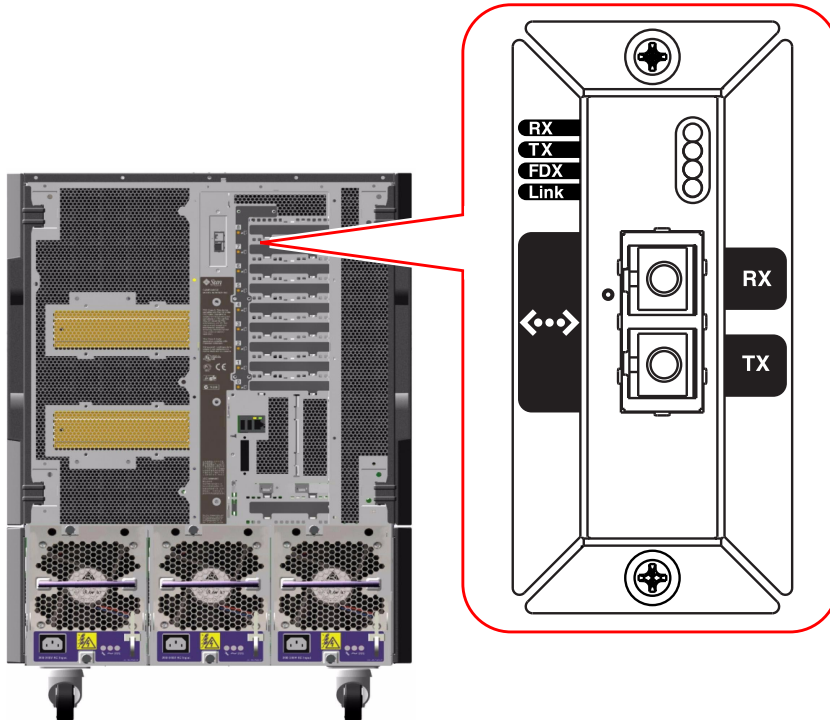
The following table shows how to interpret the various possible LED patterns.

|  |  |  | Interpretation |
|---|---|---|---|
| Off | Off | Off | Slot power is off. A disk drive can be safely inserted as part of a hot-plug operation. |
| Rapid Blinking | Off | Off | Disk drive is spinning up or down. |
| Slow Blinking | Off | Off | Disk drive is being configured or deconfigured during a hot-plug operation. |
| On | Off | Off | Disk drive is up to speed and operating normally. |
| Irregular Blinking | Off | Off | Disk drive is experiencing read or write activity. |
| On | On | Off | Disk drive has encountered a fault. |
| Off | Off | On | Disk drive can be safely removed as part of a hot-plug operation. |

For more information about disk drives, see the *Sun Fire V890 Server Owner's Guide*. For more information about hot-plug operations, see "About Hot-Pluggable and Hot-Swappable Components" on page 6.

About Gigabit Ethernet LEDs

Four LEDs provide status information for the Gigabit Ethernet port. The LEDs are located above the Gigabit Ethernet port on the system rear panel, as shown below.



| Label | Name | LED Function |
|-------|-------------------|---|
| RX | Receive Activity | Indicates data activity on the receive channel. |
| TX | Transmit Activity | Indicates data activity on the transmit channel. |
| FDX | Full Duplex | Indicates that the Gigabit Ethernet interface is operating in full-duplex mode. |
| Link | Link Present | Indicates that a link is established with a link partner. |

Split Backplane Configurations

Note – The procedures described in this appendix should be performed only by qualified service personnel.

Two split backplane configurations are available for Sun Fire V890 servers that are equipped with both a base backplane and an expansion backplane:

- Split backplane single-loop configuration
- Split backplane dual-loop configuration

The new configurations provide customers with enhanced hardware redundancy and data availability. See “About the Split Backplane Configurations” on page 274 for a description of the new configurations.

This appendix includes the following sections, which provide the setup procedures for the new configurations as well as useful reference information:

- “About the Split Backplane Configurations” on page 274
- “Firmware Patches Required” on page 275
- “Hardware Parts Required” on page 275
- “How to Set Up the Split Backplane Single-Loop Configuration” on page 276
- “How to Set Up the Split Backplane Dual-Loop Configuration” on page 284
- “Reference for Cable Routing and Connector Locations” on page 295
- “Reference for PCI Slot Locations” on page 298

About the Split Backplane Configurations

The procedures in this appendix enable you to set up the new split backplane configurations for Sun Fire V890 servers that are equipped with both a base backplane and an expansion backplane. Before you perform the procedures:

- Verify that the prerequisite firmware patches have been installed. See “Firmware Patches Required” on page 275.
- Check that you have the correct network adapters and data cables. See “Hardware Parts Required” on page 275.

Following are brief descriptions of the new configurations:

- **Split backplane single-loop configuration.** In this configuration, one PCI Dual FC Network Adapter connects to and controls Loop A of the expansion backplane while the on-board controller manages Loop A of the base backplane. This single-loop configuration forms two 6-disk arrays and enables each backplane to control and maintain the integrity of its own FC-AL loop configuration.
- **Split backplane dual-loop configuration.** In this configuration, three PCI Dual FC Network Adapters provide an independent dual-loop capability for each backplane. The dual-loop configuration provides FC-AL controller redundancy for each backplane:
 - **Base backplane.** One PCI Dual FC Network Adapter connects to and controls Loop B of the base backplane. With the on-board controller managing FC-AL operations on Loop A, the network adapter provides a dual-loop capability for the base backplane.
 - **Expansion backplane.** Two PCI Dual FC Network Adapters connect to the expansion backplane. One network adapter connects to Loop A, and the second network adapter connects to Loop B, providing a dual-loop capability for the expansion backplane.

Firmware Patches Required

Before the Solaris Operating System can recognize the split backplane configurations, the following patches must be installed to upgrade the Sun Fire V890 server fibre channel backplane firmware:

- For systems running the Solaris 8 Operating System, install Patch 111474-07 or later.
- For systems running the Solaris 9 Operating System, install Patch 113312-02 or later.

The minimum OpenBoot firmware level is version 4.7.5. The recommended OpenBoot firmware level is version 4.10.8 (patch ID 112186-10) or later.

These patches are available on the SunSolve Online web site at <http://sunsolve.sun.com>.

Hardware Parts Required

To set up the split backplane configurations, you need PCI Dual FC Network Adapters and fibre channel cables in the quantities shown in the following table.

| Configuration | Part Name | Quantity | Part Number | |
|-----------------------------|--|----------|-------------|-----------|
| | | | Service | Marketing |
| Split backplane single-loop | PCI Dual FC Network Adapter with Internal FC Interface | 1 | 375-3030 | X6727A |
| | FC-AL data cable | 1 | 530-3056 | X6755A |
| Split backplane dual-loop | PCI Dual FC Network Adapter with Internal FC Interface | 3 | 375-3030 | X6727A |
| | FC-AL data cable | 3 | 530-3056 | X6755A |

Note – The full part name of the network adapter card that connects and controls the FC-AL loops in the split backplane configurations is PCI Dual FC Network Adapter with Internal FC Interface. For ease of reference within this appendix, the name is shortened to PCI Dual FC Network Adapter.

How to Set Up the Split Backplane Single-Loop Configuration

Before You Begin

Before you begin to set up the split backplane single-loop configuration, verify that the fibre channel backplane firmware has been upgraded with the appropriate software patch cited in “Firmware Patches Required” on page 275. If the firmware is not upgraded, install the appropriate patch as instructed in the README document for the patch. Both the patch and the README document are available on the SunSolve Online web site at <http://sunsolve.sun.com>.

The following procedure is based on the assumption that the expansion backplane is already installed. If you need to install the expansion backplane, see “How to Install the Expansion FC-AL Backplane” on page 171 for instructions.

What to Do

To set up the split backplane single-loop configuration, complete the following steps:



Caution – Printed circuit boards contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions. When performing the setup instructions, place the PCI Dual FC Network Adapter on an antistatic surface and use an antistatic wrist strap.

1. **Set the OpenBoot configuration variable** `auto-boot?` **to** `false`.
2. **Power off the server.**

3. Remove the primary and secondary I/O fan tray assemblies.

See “How to Remove an I/O Fan Tray” on page 76 for instructions.

4. Disconnect the following cables (if installed) from the expansion backplane and the base backplane:

For cable connector locations, see “Reference for Cable Routing and Connector Locations” on page 295.

- a. Base/expansion cable from both base and expansion backplane connectors J0801.**
- b. FC-AL data cable from base backplane connectors J01103 and J01102, and from expansion backplane connectors J01101 and J01100.**
- c. FC-AL data cable from expansion backplane connectors J0201 and J0200, and from base backplane connectors J0501 and J0500.**

5. Choose a slot for the PCI Dual FC Network Adapter.

For higher throughput, select one of the 66-MHz slots (PCI slot 7 or 8). See “Reference for PCI Slot Locations” on page 298.

6. Install the PCI Dual FC Network Adapter.

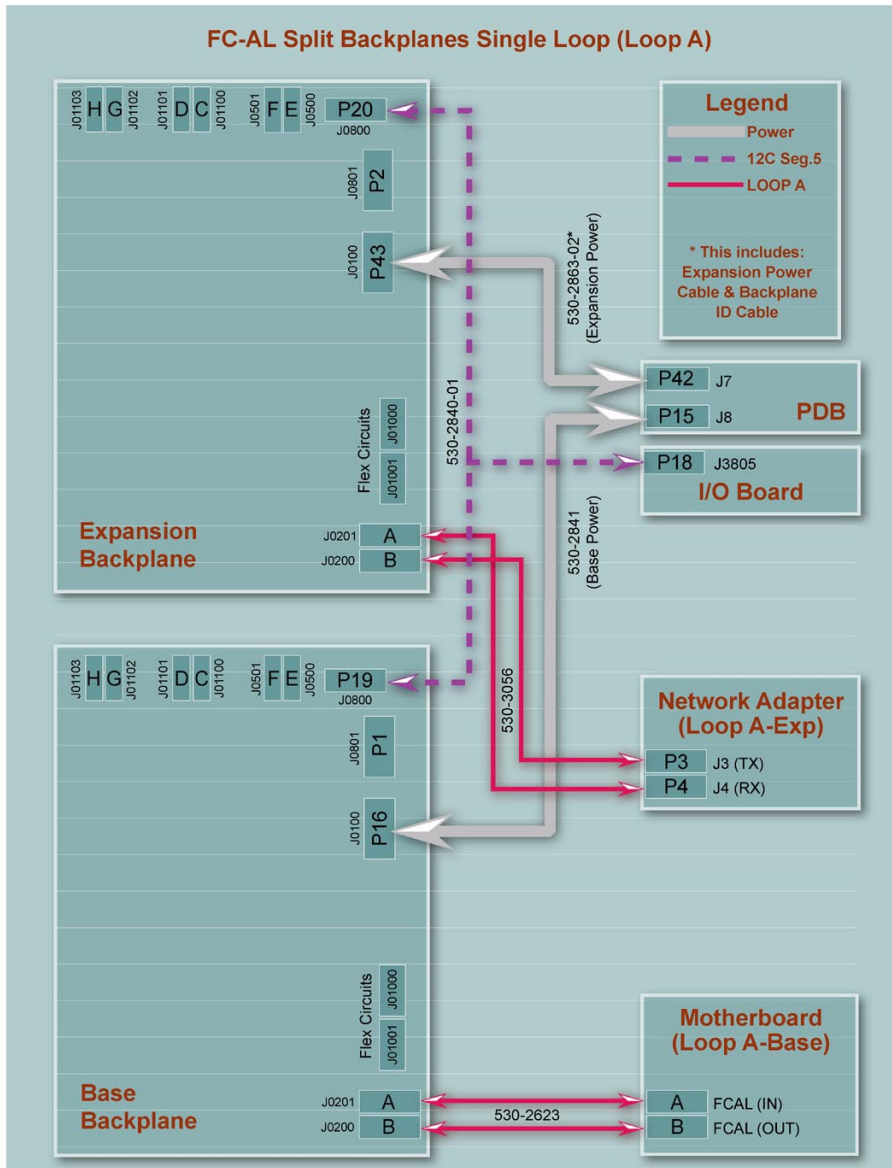
See “How to Install a PCI Card” on page 83 for PCI card installation instructions.

The PCI Dual FC Network Adapter contains two external optical transceiver connectors, located on the spine of the adapter. Pull the dust cover from each external connector before you install the adapter.

After you install the network adapter, replace the dust cover on the Port 1 connector. In this configuration, Port 1 of the network adapter cannot be used to connect to external devices. Use only Port 2 to connect to external devices.

7. Connect the new FC-AL data cable (P3 and P4) to connectors J3 (P3) and J4 (P4) on the PCI Dual FC Network Adapter and to expansion backplane connectors (C) J0200 and (D) J0201.

See “Reference for Cable Routing and Connector Locations” on page 295 for a quick reference for cable connections



Note – Route the FC-AL data cable under the I/O fan tray assembly brackets and along the floor of the I/O compartment. Use tie-wraps to secure the FC-AL data cable to the tie-wrap notches on the I/O compartment floor.

8. Install the primary and secondary I/O fan trays. (See “How to Install an I/O Fan Tray” on page 78 for instructions.) Check that the FC-AL data cable does not interfere with the fans. If necessary, use tie-wraps to attach the cable to the internal wall near the backplanes.



Caution – Be sure that the cable plug you removed from connector J0801 does not interfere with the fans. You can use the cable fasteners on the internal wall near the expansion backplane to bundle the cable plug with the cables routed along the internal wall.



Caution – Before you power on the system, be sure that the front and side doors and all plastic outer panels are properly installed.

9. Power on the system and access the ok prompt.

See “How to Initiate a Reconfiguration Boot” on page 10.

10. Verify that all disks and network adapters are recognized by the OpenBoot PROM. At the ok prompt, type the `probe-scsi-all` command.

```
ok probe-scsi-all
/pci@9,600000/pci@1/SUNW,qlc@5

/pci@9,600000/pci@1/SUNW,qlc@4
LiD HA LUN --- Port WWN --- ----- Disk description -----
 2  2  0  21000004cfce7fa0 SEAGATE ST336752FSUN36G 0408
 6  6  0  5080020000197549 SUNW     SUNWGS INT FCBPL922A
 3  3  0  2100002037e758d3 SEAGATE ST336704FSUN36G 0726
 4  4  0  21000004cfce7fca SEAGATE ST336752FSUN36G 0408
 5  5  0  21000004cfce7fc4 SEAGATE ST336752FSUN36G 0408
 0  0  0  21000004cfce7fc8 SEAGATE ST336752FSUN36G 0408
 1  1  0  21000004cfce7fd5 SEAGATE ST336752FSUN36G 0408

/pci@8,600000/SUNW,qlc@2
LiD HA LUN --- Port WWN --- ----- Disk description -----
 0  0  0  21000004cfce8257 SEAGATE ST336752FSUN36G 0408
 1  1  0  21000004cfce7fd3 SEAGATE ST336752FSUN36G 0408
```

```
2 2 0 21000004cf837f8d SEAGATE ST336605FSUN36G 0438
6 6 0 5080020000197379 SUNW SUNWGS INT FCBPL922A
3 3 0 21000004cfce7fb7 SEAGATE ST336752FSUN36G 0408
4 4 0 2100002037b3f76c SEAGATE ST336704FSUN36G 0726
5 5 0 2100002037e7efec SEAGATE ST336704FSUN36G 0726
```

11. Perform a reconfiguration boot of the Solaris software. At the `ok` prompt, type the `boot -r` command.

```
ok boot -r
```

12. Verify that the Solaris software recognizes both the base and expansion backplanes. At the Solaris prompt, type the `luxadm probe` command.

```
# luxadm probe
Found Enclosure(s):
SUNWGS INT FCBPL Name:FCloop Node WWN:508002000017c4d8
Logical Path:/dev/es/ses0
SUNWGS INT FCBPL Name:FCloop Node WWN:50800200001cb798
Logical Path:/dev/es/ses2
```

The `luxadm probe` command displays the enclosure name, World Wide Number, and logical path name for each FC-AL backplane. Notice that the display shows the same enclosure name (`FCloop` in the example) for both backplanes. Also note the logical path name of each device. You need this information to perform Step 13.

13. **Change the enclosure name of one of the FC-AL backplanes. Type the `luxadm enclosure_name` command.**

Each backplane must have a unique enclosure name. Use the `luxadm enclosure_name` command to assign a unique name by changing one of the enclosure names as shown in the following example.

To change the enclosure name, assign the new name (`FCloop2` in the example) and enter the path name (`/dev/es/ses2` in the example) of the appropriate backplane. You obtained the path name from the `luxadm probe` command output shown in Step 12.

```
# luxadm enclosure_name FCloop2 /dev/es/ses2
```

Note – There is no output from the `luxadm enclosure_name` command.

14. **Verify that the Solaris software recognizes the correct enclosure name for each backplane. Type the `luxadm probe` command.**

Notice that the output example now shows a unique name (`FCloop` and `FCloop2` in the example) for each backplane.

```
# luxadm probe
Found Enclosure(s):
SUNWGS INT FCBPL   Name:FCloop   Node WWN:508002000017c4d8
Logical Path:/dev/es/ses0
SUNWGS INT FCBPL   Name:FCloop2  Node WWN:50800200001cb798
Logical Path:/dev/es/ses2
```

15. Verify that the Solaris software recognizes all disks attached to each backplane. Type the `luxadm display` command and specify the enclosure name for each backplane.

In the following example, the base backplane (FCloop in the example) has six attached disks in slots 0 through 5.

```
# luxadm display FCloop
SUNWGS INT FCBPL
DISK STATUS
SLOT   DISKS                (Node WWN)
0      On (O.K.)         20000004cf627ba1
1      On (O.K.)         20000004cf620dc0
2      On (O.K.)         20000020372aef55
3      On (O.K.)         20000004cf620a05
4      On (O.K.)         20000020372af169
5      On (O.K.)         20000004cf620c63
6      On (Login failed)
7      On (Login failed)
8      On (Login failed)
9      On (Login failed)
10     On (Login failed)
11     On (Login failed)
SUBSYSTEM STATUS
FW Revision:922A   Box ID:0
Node WWN:508002000017c4d8   Enclosure Name:FCloop
SSC100's - 0=Base Bkpln, 1=Base LoopB, 2=Exp Bkpln, 3=Exp LoopB
    SSC100 #0:   O.K.(922A/ 8D3C)
    SSC100 #1:   O.K.(922A/ 8D3C)
    SSC100 #2:   Not Installed
    SSC100 #3:   Not Installed
    Temperature Sensors - 0 Base, 1 Expansion
    0:22°C
    1Not Installed
```

```
Backplanes - A=Base, B=Expansion
          A: O.K.
          B: Not Installed
Default Language is USA English, ASCII
```

The following example shows the luxadm display output for the expansion backplane (FCloop2 in the example).

```
# luxadm display FCloop2
SUNWGS INT FCBPL
DISK STATUS
SLOT   DISKS                (Node WWN)
0      Not Installed
1      Not Installed
2      Not Installed
3      Not Installed
4      Not Installed
5      Not Installed
6      On (O.K.)            20000004cf4cfd9b
7      On (O.K.)            200000203790f8d0
8      On (O.K.)            200000203790f8bb
9      On (O.K.)            20000004cf6206a8
10     On (O.K.)            2000002037e34cd1
11     On (O.K.)            20000004cf620859
SUBSYSTEM STATUS
FW Revision:922A   Box ID:0
Node WWN:50800200001cb798   Enclosure Name:FCloop2
SSC100's - 0=Base Bkpln, 1=Base LoopB, 2=Exp Bkpln, 3=Exp LoopB
          SSC100 #0:      Not Installed
          SSC100 #1:      Not Installed
          SSC100 #2:      O.K.(922A/ 8D3C)
          SSC100 #3:      O.K.(922A/ 8D3C)
```

```
Temperature Sensors - 0 Base, 1 Expansion
0:23°C
1Not Installed
Backplanes - A=Base, B=Expansion
A: Not Installed
B: O.K.
Default Language is USA English, ASCII
```

How to Set Up the Split Backplane Dual-Loop Configuration

Before You Begin

Before you begin to set up the split backplane dual-loop configuration, verify that the fibre channel backplane firmware has been upgraded with the appropriate software patch cited in “Firmware Patches Required” on page 275. If the firmware is not upgraded, install the appropriate patch as instructed in the README document for the patch. Both the patch and the README document are available on the SunSolve Online web site at <http://sunsolve.sun.com>.

The following procedure is based on the assumption that the expansion backplane is already installed. If you need to install the expansion backplane, see “How to Install the Expansion FC-AL Backplane” on page 171 for instructions.

What to Do

To set up the split backplane dual-loop configuration, complete the following steps:



Caution – Printed circuit boards contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions. When performing the setup instructions, place the PCI Dual FC Network Adapters on an antistatic surface and use an antistatic wrist strap.

1. **Set the OpenBoot configuration variable `auto-boot?` to `false`.**

2. **Power off the server.**

3. **Remove the primary and secondary I/O fan tray assemblies.**

See “How to Remove an I/O Fan Tray” on page 76 for instructions.

4. **Disconnect the following cables (if installed) from the expansion backplane and the base backplane:**

For cable connector locations, see “Reference for Cable Routing and Connector Locations” on page 295.

a. **Base/expansion cable from base and expansion backplane connector J0801.**

b. **FC-AL data cable (Loop B) from base backplane connectors J01103 and J01102 and from expansion backplane connectors J01101 and J01100.**

c. **FC-AL data cable (Loop A) from expansion backplane connectors J0201 and J0200 and from base backplane connectors J0501 and J0500.**

5. **Choose the slots for the PCI Dual FC Network Adapters.**

For easy cable routing, plan to install two of the PCI Dual FC Network Adapters in any two of PCI slots 0 through 6 and the other network adapter in PCI slot 7 or 8. Installing the network adapters in these slots enables you to route all three cables along the floor of the I/O compartment. See “Reference for PCI Slot Locations” on page 298.

6. **Install the three PCI Dual FC Network Adapters.**

See “How to Install a PCI Card” on page 83 for instructions.

Each PCI Dual FC Network Adapter contains two external optical transceiver connectors, located on the spine of the adapter. Pull the dust cover from each external connector before you install the adapters.

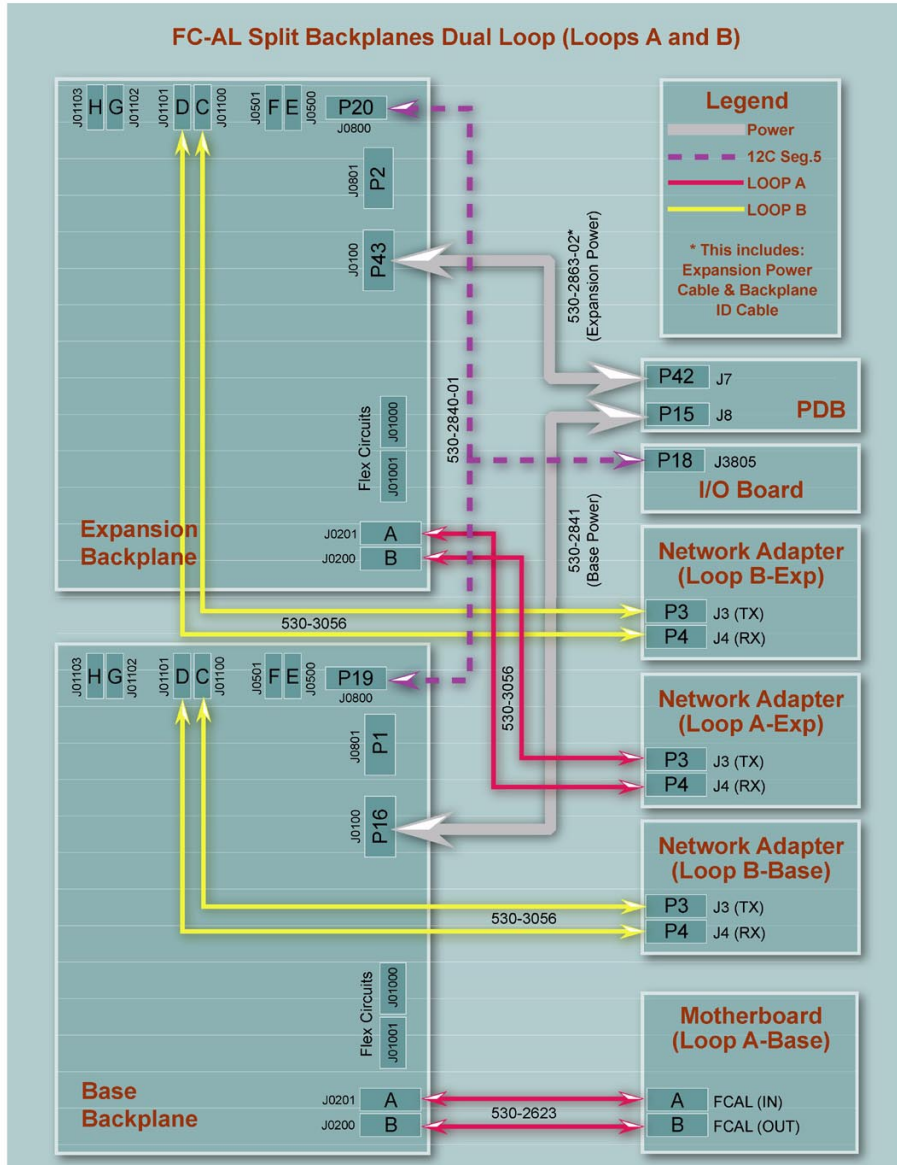
After you install the network adapters, replace the dust covers on the Port 1 connectors. In this configuration, Port 1 of the network adapters cannot be used to connect to external devices. Use only Port 2 to connect to external devices.

7. Connect the three new FC-AL data cables as follows:

See "Reference for Cable Routing and Connector Locations" on page 295 for a quick reference for cable connections.

- a. For one of the PCI Dual FC Network Adapters in slots 0 through 6, connect a new FC-AL data cable (P3 and P4) from network adapter connectors J3 (P3) and J4 (P4) to expansion backplane connectors (C) J0200 and (D) J0201.**

- b. For the other PCI Dual FC Network Adapter in slots 0 through 6, connect a new FC-AL data cable (P3 and P4) from network adapter connectors J3 (P3) and J4 (P4) to expansion backplane connectors (C) J01100 and (D) J01101.
- c. For the PCI Dual FC Network Adapter in slot 7 or 8, connect a new FC-AL data cable (P3 and P4) from network adapter connectors J3 (P3) and J4 (P4) to base backplane connectors (C) J01100 and (D) J01101.



Note – Route the FC-AL data cables under the I/O fan tray assembly brackets and along the floor of the I/O compartment. Use tie-wraps to secure the FC-AL cables to the tie-wrap notches on the I/O compartment floor.

Note – If you install Loop B, you must also install Loop A or the backplanes will not initialize.

8. Install the primary and secondary I/O fan trays. (See “How to Install an I/O Fan Tray” on page 78 for instructions.) Check that the FC-AL cables do not interfere with the fan. If necessary, use tie-wraps to attach the cables to the internal wall near the FC-AL backplanes.



Caution – Be sure that the cable plug you removed from connector J0801 does not interfere with the fans. You can use the cable fasteners on the internal wall near the expansion backplane to bundle the cable plug with the cables routed along the internal wall.



Caution – Before you power on the system, be sure that the front and side doors and all plastic outer panels are properly installed.

9. Power on the system and access the `ok` prompt.
See “How to Initiate a Reconfiguration Boot” on page 10.
10. Verify that all disks and network adapters are recognized by the OpenBoot PROM. At the `ok` prompt, type the `probe-scsi-all` command.

```
ok probe-scsi-all
/pci@9,600000/pci@1/SUNW,qlc@5

/pci@9,600000/pci@1/SUNW,qlc@4
LiD HA LUN --- Port WWN --- ----- Disk description -----
 2  2  0  21000004cfce7fa0 SEAGATE ST336752FSUN36G 0408
 6  6  0  5080020000197549 SUNW      SUNWGS INT FCBPL922A
 3  3  0  2100002037e758d3 SEAGATE ST336704FSUN36G 0726
 4  4  0  21000004cfce7fca SEAGATE ST336752FSUN36G 0408
 5  5  0  21000004cfce7fc4 SEAGATE ST336752FSUN36G 0408
```



```

0 0 0 21000004cfce7fc8 SEAGATE ST336752FSUN36G 0408
1 1 0 21000004cfce7fd5 SEAGATE ST336752FSUN36G 0408

/pci@8,600000/SUNW,qlc@2
LiD HA LUN --- Port WWN --- ----- Disk description -----
0 0 0 21000004cfce8257 SEAGATE ST336752FSUN36G 0408
1 1 0 21000004cfce7fd3 SEAGATE ST336752FSUN36G 0408
2 2 0 21000004cf837f8d SEAGATE ST336605FSUN36G 0438
6 6 0 5080020000197379 SUNW SUNWGS INT FCBPL922A
3 3 0 21000004cfce7fb7 SEAGATE ST336752FSUN36G 0408
4 4 0 2100002037b3f76c SEAGATE ST336704FSUN36G 0726
5 5 0 2100002037e7efec SEAGATE ST336704FSUN36G 0726

/pci@8,700000/scsi@1
Target 6
Unit 0 Removable Read Only device TOSHIBA DVD-ROM SD-
M14011009

/pci@8,700000/pci@5/SUNW,qlc@5

/pci@8,700000/pci@5/SUNW,qlc@4
LiD HA LUN --- Port WWN --- ----- Disk description -----
1 1 0 22000004cfce7fd5 SEAGATE ST336752FSUN36G 0408
0 0 0 22000004cfce7fc8 SEAGATE ST336752FSUN36G 0408
2 2 0 22000004cfce7fa0 SEAGATE ST336752FSUN36G 0408
6 6 0 508002000019754a SUNW SUNWGS INT FCBPL922A
3 3 0 2200002037e758d3 SEAGATE ST336704FSUN36G 0726
4 4 0 22000004cfce7fca SEAGATE ST336752FSUN36G 0408
5 5 0 22000004cfce7fc4 SEAGATE ST336752FSUN36G 0408

/pci@8,700000/pci@4/SUNW,qlc@5

```

```

/pci@8,700000/pci@4/SUNW,qlc@4
LiD HA LUN --- Port WWN --- ----- Disk description -----
 1  1  0  22000004cfce7fd3 SEAGATE ST336752FSUN36G 0408
 0  0  0  22000004cfce8257 SEAGATE ST336752FSUN36G 0408
 2  2  0  22000004cf837f8d SEAGATE ST336605FSUN36G 0438
 6  6  0  508002000019737a SUNW     SUNWGS INT FCBPL922A
 3  3  0  22000004cfce7fb7 SEAGATE ST336752FSUN36G 0408
 4  4  0  2200002037b3f76c SEAGATE ST336704FSUN36G 0726
 5  5  0  2200002037e7efec SEAGATE ST336704FSUN36G 0726

```

11. Perform a reconfiguration boot of the Solaris software. At the `ok` prompt, type the `boot -r` command.

```
ok boot -r
```

12. Verify that the Solaris software recognizes both the base and expansion backplanes. At the Solaris prompt, type the `luxadm probe` command.

```

# luxadm probe
Found Enclosure(s):
SUNWGS INT FCBPL   Name:FCloop           Node WWN:5080020000197378
  Logical Path:/dev/es/ses0
  Logical Path:/dev/es/ses1
SUNWGS INT FCBPL   Name:FCloop           Node WWN:5080020000197548
  Logical Path:/dev/es/ses2
  Logical Path:/dev/es/ses3

```

The `luxadm probe` command displays the enclosure name, World Wide Number, and logical path name for each FC-AL backplane. Notice that the display shows the same enclosure name (FCloop in the example) for both backplanes. Also note the logical path name of each device. You need this information to perform Step 13.

13. **Change the enclosure name of one of the FC-AL backplanes. Type the `luxadm enclosure_name` command.**

Each backplane must have a unique enclosure name. Use the `luxadm enclosure_name` command to assign a unique name by changing one of the enclosure names as shown in the following example.

To change the enclosure name, assign the new name (FCloop2 in the example) and enter the path name (`/dev/es/ses2` in the example) of the appropriate backplane. You obtained the path name from the output from the `luxadm probe` command shown in Step 12. You can enter either of the path names (`/dev/es/ses2` or `/dev/es/ses3`) shown in Step 12.

```
# luxadm enclosure_name FCloop2 /dev/es/ses2
```

Note – There is no output from the `luxadm enclosure_name` command.

14. **Verify that the Solaris software recognizes the correct enclosure name for each backplane. Type the `luxadm probe` command.**

Notice that the output example now shows a unique name (FCloop and FCloop2 in the example) for each backplane.

```
# luxadm probe
Found Enclosure(s):
SUNWGS INT FCBPL   Name:FCloop           Node WWN:5080020000197378
  Logical Path:/dev/es/ses0
  Logical Path:/dev/es/ses1
SUNWGS INT FCBPL   Name:FCloop2          Node WWN:5080020000197548
  Logical Path:/dev/es/ses2
  Logical Path:/dev/es/ses3
```

15. Verify that the Solaris software recognizes all disks attached to each backplane. Type the `luxadm display` command and specify the enclosure name for each backplane.

In the following example, the base backplane (FCloop in the example) has six attached disks in slots 0 through 5.

```
# luxadm display FCloop
SUNWGS INT FCBPL
DISK STATUS
SLOT   DISKS                (Node WWN)
0      On (O.K.)         20000004cfce8257
1      On (O.K.)         20000004cfce7fd3
2      On (O.K.)         20000004cf837f8d
3      On (O.K.)         20000004cfce7fb7
4      On (O.K.)         2000002037b3f76c
5      On (O.K.)         2000002037e7efec
6      On (Login failed)
7      On (Login failed)
8      On (Login failed)
9      On (Login failed)
10     On (Login failed)
11     On (Login failed)
SUBSYSTEM STATUS
FW Revision:922A   Box ID:0
Node WWN:5080020000197378   Enclosure Name:FCloop
SSC100's - 0=Base Bkpln, 1=Base LoopB, 2=Exp Bkpln, 3=Exp LoopB
SSC100 #0:   O.K.(922A/ 8D3C)
SSC100 #1:   O.K.(922A/ 8D3C)
SSC100 #2:   Not Installed
SSC100 #3:   Not Installed
```

```
Temperature Sensors - 0 Base, 1 Expansion
      0:22°C
            1Not Installed
Backplanes - A=Base, B=Expansion
      A: O.K.
      B: Not Installed
Default Language is USA English, ASCII
```

The following example shows the luxadm display output for the expansion backplane (FCloop2 in the example).

```
# luxadm display FCloop2
SUNWGS INT FCBPL
DISK STATUS
SLOT   DISKS                (Node WWN)
0      Not Installed
1      Not Installed
2      Not Installed
3      Not Installed
4      Not Installed
5      Not Installed
6      On (O.K.)           20000004cfce7fc8
7      On (O.K.)           20000004cfce7fd5
8      On (O.K.)           20000004cfce7fa0
9      On (O.K.)           2000002037e758d3
10     On (O.K.)           20000004cfce7fca
11     On (O.K.)           20000004cfce7fc4
SUBSYSTEM STATUS
FW Revision:922A   Box ID:0
Node WWN:5080020000197548   Enclosure Name:FCloop2
SSC100's - 0=Base Bkpln, 1=Base LoopB, 2=Exp Bkpln, 3=Exp LoopB
      SSC100 #0:   Not Installed
```

SSC100 #1: Not Installed

SSC100 #2: O.K.(922A/ 8D3C)

SSC100 #3: O.K.(922A/ 8D3C)

Temperature Sensors - 0 Base, 1 Expansion

0:24°C

1Not Installed

Backplanes - A=Base, B=Expansion

A: Not Installed

B: O.K.

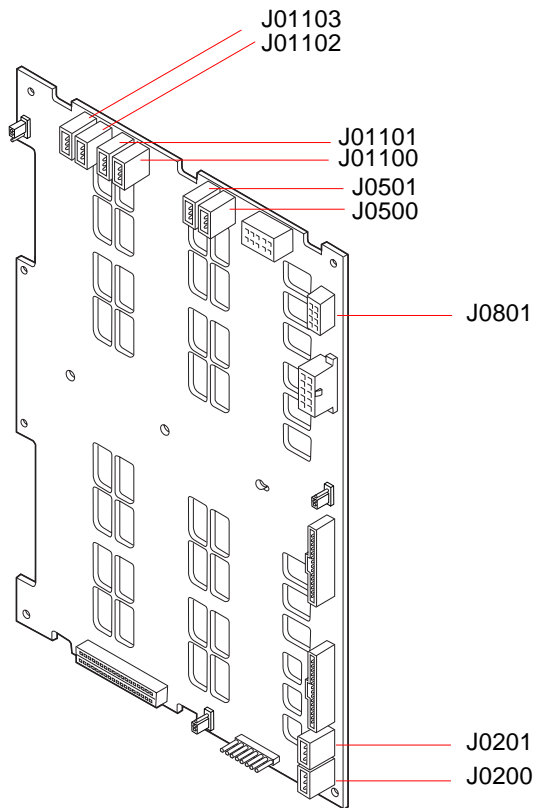
Default Language is USA English, ASCII

Reference for Cable Routing and Connector Locations

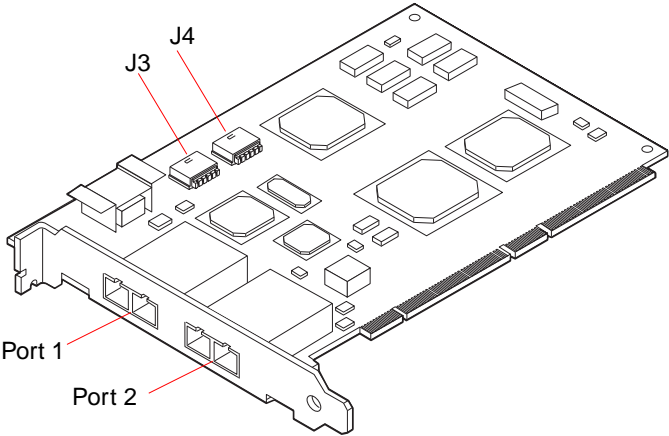
Cable connection information for the split backplane single-loop and dual-loop configurations is shown in the following table.

| Cable Name | Cable End | Connect to |
|--|-----------|-----------------------------------|
| Connections for Single-Loop Configuration | | |
| FC-AL data cable | C | Expansion backplane at J0200 |
| | D | Expansion backplane at J0201 |
| | P3 | PCI Dual FC Network Adapter at J3 |
| | P4 | PCI Dual FC Network Adapter at J4 |
| Connections for Dual-Loop Configuration | | |
| Connections for the Two PCI FC Network Adapters Installed in Slots 0 through 6 | | |
| FC-AL data cable (1 of 3) | C | Expansion backplane at J0200 |
| | D | Expansion backplane at J0201 |
| | P3 | PCI Dual FC Network Adapter at J3 |
| | P4 | PCI Dual FC Network Adapter at J4 |
| FC-AL data cable (2 of 3) | C | Expansion backplane at J01100 |
| | D | Expansion backplane at J01101 |
| | P3 | PCI Dual FC Network Adapter at J3 |
| | P4 | PCI Dual FC Network Adapter at J4 |
| Connections for the PCI FC Network Adapter Installed in Slot 7 or 8 | | |
| FC-AL data cable (3 of 3) | C | Base backplane at J01100 |
| | D | Base backplane at J01101 |
| | P3 | PCI Dual FC Network Adapter at J3 |
| | P4 | PCI Dual FC Network Adapter at J4 |

The locations of the base and expansion backplane connectors are shown in the following figure.

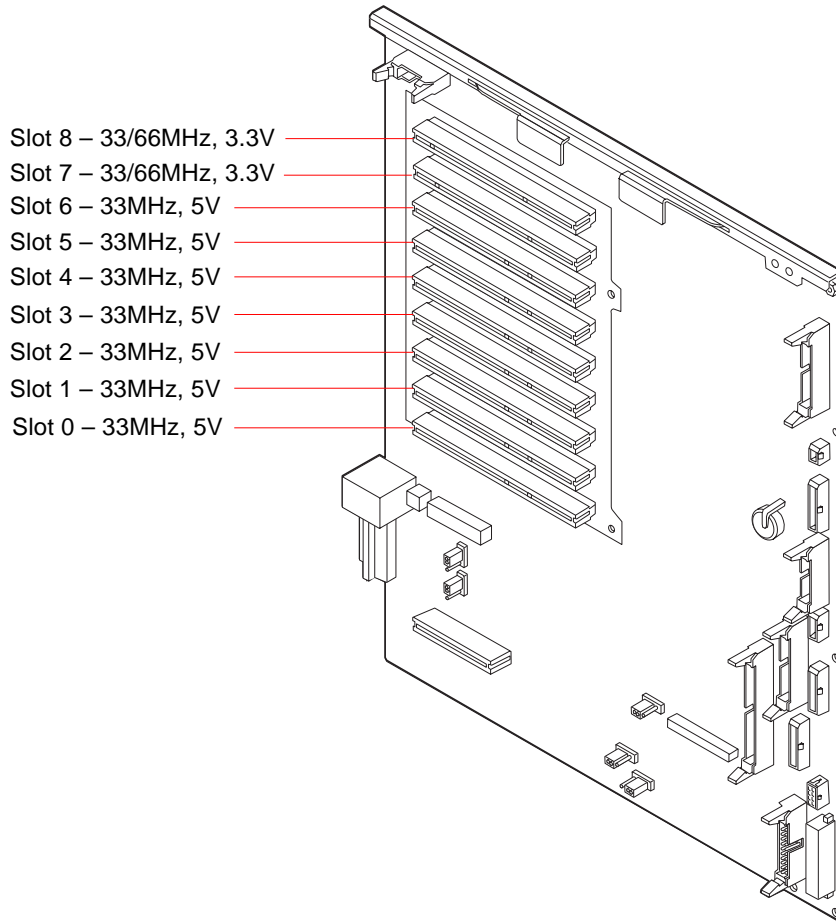


The locations of the connectors on the PCI Dual FC Network Adapter are shown in the following figure.



Reference for PCI Slot Locations

The locations and characteristics of the PCI slots are shown in the following figure.



Connector Pinouts

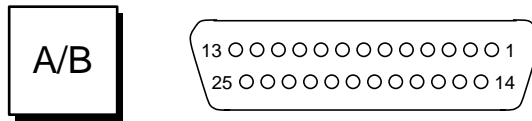
This appendix gives you reference information about the system's rear panel ports and pin assignments. Topics covered in this appendix include:

- "Reference for the Serial Port A and B Connectors" on page 300
- "Reference for the USB Connectors" on page 301
- "Reference for the Twisted-Pair Ethernet Connector" on page 302
- "Reference for the System Controller Ethernet Connector" on page 303
- "Reference for the System Controller Serial Connector" on page 304

Reference for the Serial Port A and B Connectors

The serial port conforms to EIA-423 and EIA-232D specifications.

Serial Port Connector Diagram



Serial Port Signals

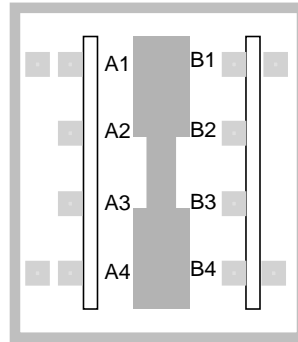
Signal descriptions ending in “A” indicate that the signal is associated with the port provided by a standard DB-25 serial cable or the connector labeled “A” on the optional DB-25 splitter cable. Signal descriptions ending in “B” indicate that the signal is associated with the port provided by the connector labeled “B” on the optional DB-25 splitter cable.

| Pin | Signal Description | Pin | Signal Description |
|-----|-----------------------|-----|-----------------------------|
| 1 | No Connection | 14 | Transmit Data B |
| 2 | Transmit Data A | 15 | Transmit Clock A (External) |
| 3 | Receive Data A | 16 | Receive Data B |
| 4 | Ready To Send A | 17 | Receive Clock A |
| 5 | Clear To Send A | 18 | Receive Clock B |
| 6 | Synchronous A | 19 | Ready To Send B |
| 7 | Signal Ground A | 20 | Data Terminal Ready A |
| 8 | Data Carrier Detect A | 21 | No Connection |
| 9 | No Connection | 22 | No Connection |
| 10 | No Connection | 23 | No Connection |
| 11 | Data Terminal Ready B | 24 | Transmit Clock A (Internal) |
| 12 | Data Carrier Detect B | 25 | Transmit Clock B |
| 13 | Clear To Send B | | |

Reference for the USB Connectors

Two Universal Serial Bus (USB) connectors are located on the system I/O board and can be accessed from the rear panel.

USB Connector Diagram



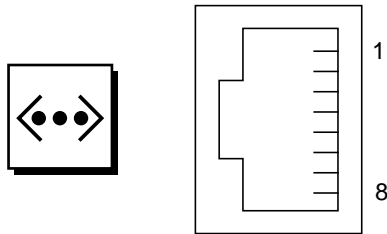
USB Connector Signals

| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| A1 | +5 VDC | B1 | +5 VDC |
| A2 | Port Data_N | B2 | Port Data_N |
| A3 | Port Data_P | B3 | Port Data_P |
| A4 | Ground | B4 | Ground |

Reference for the Twisted-Pair Ethernet Connector

The twisted-pair Ethernet (TPE) connector is an RJ-45 connector located on the system I/O board and can be accessed from the rear panel.

TPE Connector Diagram



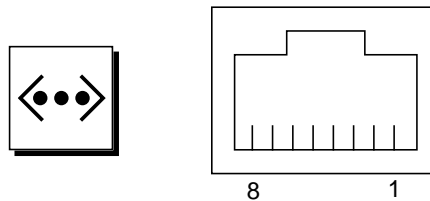
TPE Connector Signals

| Pin | Signal Description | Pin | Signal Description |
|-----|-------------------------|-----|-------------------------|
| 1 | Transmit Data + | 5 | Common Mode Termination |
| 2 | Transmit Data - | 6 | Receive Data - |
| 3 | Receive Data + | 7 | Common Mode Termination |
| 4 | Common Mode Termination | 8 | Common Mode Termination |

Reference for the System Controller Ethernet Connector

The system controller Ethernet connector is an RJ-45 connector located on the system controller board and can be accessed from the rear panel.

System Controller Ethernet Connector Diagram



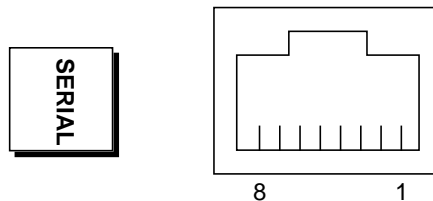
System Controller Ethernet Connector Signals

| Pin | Signal Description | Pin | Signal Description |
|-----|-------------------------|-----|-------------------------|
| 1 | Transmit Data + | 5 | Common Mode Termination |
| 2 | Transmit Data - | 6 | Receive Data - |
| 3 | Receive Data + | 7 | Common Mode Termination |
| 4 | Common Mode Termination | 8 | Common Mode Termination |

Reference for the System Controller Serial Connector

The system controller serial connector is an RJ-45 connector located on the system controller card and can be accessed from the rear panel.

System Controller Serial Connector Diagram



System Controller Serial Connector Signals

| Pin | Signal Description | Pin | Signal Description |
|-----|---------------------|-----|--------------------|
| 1 | Ready To Send | 5 | Ground |
| 2 | Data Terminal Ready | 6 | Receive Data |
| 3 | Transmit Data | 7 | No Connection |
| 4 | Ground | 8 | Clear To Send |

System Specifications

This appendix provides the following specifications for the Sun Fire V890 server:

- “Reference for Physical Specifications” on page 306
- “Reference for Electrical Specifications” on page 306
- “Reference for Environmental Requirements” on page 307
- “Reference for Agency Compliance Specifications” on page 308
- “Reference for Clearance and Service Access Specifications” on page 309

Reference for Physical Specifications

The dimensions and weight of the system are as follows.

| Measurement | U.S. | Metric | Comments |
|-----------------------|----------|----------|--|
| Height (with casters) | 28.1 in | 71.4 cm | |
| Width | 18.9 in | 48.0 cm | |
| Depth | 32.9 in | 83.6 cm | |
| Weight: | | | |
| Minimum | 194.0 lb | 88.0 kg | Actual weight depends on the installed options |
| Maximum | 288.0 lb | 130.6 kg | |
| Power Cord | 8.2 ft | 2.5 m | |

Reference for Electrical Specifications

The following table provides the electrical specifications for the system.

| Parameter | Value |
|-------------------------------------|---|
| Input | |
| Nominal Frequencies | 50 Hz or 60 Hz nominal |
| Nominal Voltage Range | Autoranging 200 to 240 VAC |
| Maximum Current AC RMS | 8 A @ 200 VAC (each power cord for two power supplies per system) |
| AC Operating Range | 180 to 264 Vrms, 47 - 63Hz |
| Output | |
| +3.3 VDC | 3 to 72 A |
| +5 VDC | 3 to 56 A |
| +12 VDC | 1 to 35 A |
| +48 VDC | 0 to 50 A |
| Maximum DC Power Output | 2509 Watts |
| Maximum System AC Power Consumption | 3200 Watts |
| Maximum System Heat Dissipation | 10,912 BTU/hr |
| Volt-Ampere Rating | 2078 VA with 1629 Watt load (PF=0.98) |

Reference for Environmental Requirements

The operating and non-operating environmental requirements for the system are as follows.

| Parameter | Value |
|--------------------|---|
| Operating | |
| Temperature | 5°C to 35°C (41°F to 95°F)—IEC 68-2-1, 68-2-2 |
| Humidity | 20% to 80% RH, noncondensing; 27 °C max wet bulb—IEC 68-2-2, 68-2-3 |
| Altitude | 0 to 3000 meters (0 to 10,000 feet)—IEC 68-2-40, 68-2-41 |
| Vibration: | |
| Deskside | 0.0002 g ² /Hz, 5 to 500 Hz (random)—IEC 68-2-6 |
| Rackmounted | 0.00015 g ² /Hz, 5 to 500 Hz (random)—IEC 68-2-6 |
| Shock: | |
| Deskside | 4 g peak, 11 milliseconds half-sine pulse—IEC 68-2-27 |
| Rackmounted | 3 g peak, 11 milliseconds half-sine pulse—IEC 68-2-27 |
| Declared Acoustics | 6.7 bels dB(A) operating, 7.6 bels dB(A) at ok prompt |
| Non-Operating | |
| Temperature | -20°C to 60°C (-4°F to 140°F)—IEC 68-2-1, 68-2-2 |
| Humidity | 95% RH, noncondensing at 40°C—IEC 68-2-2, 68-2-3 |
| Altitude | 0 to 12,000 meters (0 to 40,000 feet)—IEC 68-2-40, 68-2-41 |
| Vibration: | |
| Deskside | 0.002 g ² /Hz, 5 to 500 Hz (random)—IEC 68-2-6 |
| Rackmounted | 0.0015 g ² /Hz, 5 to 500 Hz (random)—IEC 68-2-6 |
| Shock: | |
| Deskside | 15 g peak, 11 milliseconds half-sine pulse—IEC 68-2-27e |
| Rackmounted | 10 g peak, 11 milliseconds half-sine pulse—IEC 68-2-27e |
| Handling Drops | 50 mm—IEC 68-2-31 |
| Threshold Impact | 1 m/s—SUN 900-1813 |

Reference for Agency Compliance Specifications

The system complies with the following specifications.

| Category | Relevant Standards |
|----------|--|
| Safety | EN60950/IEC60950 TUV UL 60950, CB Scheme IEC 60950, C22.2 No. 60950 from UL |
| RFI/EMI | Australia/New Zealand AS/NZ 3548 Class A Industry Canada ICES-003 Class A European Community EN55022 Class A Japan VCCI Class A Taiwan CNS 13438 Class A US FCC 47CFR15.B Class A |
| Immunity | EN55024 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-8 EN61000-4-11 |
| X-ray | US DHHS 21CFR Subchapter J PTB German X-ray Decree |

Reference for Clearance and Service Access Specifications

Minimum clearances needed for proper cooling are as follows.

| Blockage | Required Clearance |
|-------------------------|---------------------------|
| Front blockage only | 3.0 in (7.6 cm) |
| Rear blockage only | 3.5 in (8.9 cm) |
| Front and rear blockage | |
| Front clearance | 3.5 in (8.9 cm) |
| Rear clearance | 4.0 in (10.2 cm) |

Minimum clearances needed for servicing the system are as follows.

| Area | Required Clearance |
|--------------------|---------------------------|
| Front | |
| Deskside system | 36 in (91 cm) |
| Rackmounted system | 48 in (122 cm) |
| Rear | 36 in (91 cm) |
| Right | 36 in (91 cm) |
| Left | 36 in (91 cm) |

Safety Precautions

Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

Safety Precautions

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

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this book and/or on the product:



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



Caution – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.



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

Depending on the type of power switch your device has, one of the following symbols may be used:



On – Applies AC power to the system.



Off - Removes AC power from the system.



Standby – The On/Standby switch is in the standby position.

Modifications to Equipment

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

Placement of a Sun 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 – The workplace-dependent noise level defined in DIN 45 635 Part 1000 must be 70Db(A) or less.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection



Caution – 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 – Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.



Caution – Your 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 power outlet.



Caution – In order to remove all power from the system, disconnect all three power cords.

The following caution applies only to devices with a Standby power switch:



Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

Lithium Battery



Caution – The Sun Fire V890 system I/O board contains lithium batteries. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.

System Unit Cover

You must open the side doors of your Sun Fire V890 server to add cards, memory, or internal options. Be sure to close and secure the doors before powering on your system.



Caution – Do not open. Qualified Service Personnel Only. Failure to take this precaution may result in personal injury and system damage.

Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

CD-ROM



Caution – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:



Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.



Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.



Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole benutzt werden:



Ein – Setzt das System unter Wechselstrom.



Aus – Unterbricht die Wechselstromzufuhr zum Gerät.



Wartezustand (Stand-by-Position) - Der Ein-/Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten



Achtung – Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden.



Achtung – Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70Db(A) oder weniger.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Anschluß des Netzkabels



Achtung – Sun-Produkte sind für den Betrieb an Einphasen-Stromnetzen mit geerdetem Nulleiter vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.



Achtung – Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.



Achtung – Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.



Achtung – Bei Produkten mit mehreren Kabeln müssen zur vollständigen Unterbrechung der Stromversorgung alle Kabel abgezogen werden.

Die folgende Warnung gilt nur für Geräte mit Wartezustand-Netzschalter:



Achtung – Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Lithiumbatterie



Achtung – CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie (Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, oder MK48T08). Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgewechselt werden, da sie bei falscher Handhabung explodieren kann. Werfen Sie die Batterie nicht ins Feuer. Versuchen Sie auf keinen Fall, die Batterie auszubauen oder wiederaufzuladen.

Gehäuseabdeckung

Sie müssen die obere Abdeckung Ihres Sun-Systems entfernen, um interne Komponenten wie Karten, Speicherchips oder Massenspeicher hinzuzufügen. Bringen Sie die obere Gehäuseabdeckung wieder an, bevor Sie Ihr System einschalten.



Achtung – Nicht öffnen. Nur für qualifiziertes Service-Personal. Bei Nichtbeachtung kann es zu Personenschäden bzw. zu Beschädigungen am System kommen.

Einhaltung der Richtlinien für Laser

Sun-Produkte, die mit Laser-Technologie arbeiten, entsprechen den Anforderungen der Laser Klasse 1.

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Klasse 1 Laser Apparat
Laser Klasse 1

CD-ROM



Warnung – Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchführung von Prozeduren, die von den hier beschriebenen abweichen, können gefährliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

- Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.
- Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.
- Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés :



Attention: – risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.



Attention: – surface à température élevée. Évitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.



Attention: – présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:



MARCHE – Votre système est sous tension (courant alternatif).



ARRET - Votre système est hors tension (courant alternatif).



VEILLEUSE – L'interrupteur Marche/Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun



Attention: – pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.



Attention: – Le niveau de pression acoustique au poste de travail s'élève selon la norme DIN 45 635 section 1000, à 70 dB (A) ou moins.

Conformité SELV

Sécurité : les raccordements E/S sont conformes aux normes SELV.

Connexion du cordon d'alimentation



Attention: – les produits Sun sont conçus pour fonctionner avec des alimentations monophasées munies d'un conducteur neutre mis à la terre. Pour écarter les risques d'électrocution, ne pas brancher de produit Sun dans un autre type d'alimentation secteur. En cas de doute quant au type d'alimentation électrique du local, veuillez vous adresser au directeur de l'exploitation ou à un électricien qualifié.



Attention: – tous les cordons d'alimentation n'ont pas forcément la même puissance nominale en matière de courant. Les rallonges d'usage domestique n'offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d'ordinateurs. Ne pas utiliser de rallonge d'usage domestique avec votre produit Sun.



Attention: – votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils (avec prise de terre). Pour écarter tout risque d'électrocution, branchez toujours ce cordon dans une prise mise à la terre.



Attention: – débranchez tous les cordons pour couper l'alimentation du système.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur VEILLEUSE:



Attention: – le commutateur d'alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C'est la prise d'alimentation qui sert à mettre le produit hors tension. Veillez donc à installer le produit à proximité d'une prise murale facilement accessible. Ne connectez pas la prise d'alimentation lorsque le châssis du système n'est plus alimenté.

Batterie au lithium



Attention: – sur les cartes CPU Sun, une batterie au lithium (référence MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, ou MK48T08.) a été moulée dans l'horloge temps réel SGS. Les batteries ne sont pas des pièces remplaçables par le client. Elles risquent d'exploser en cas de mauvais traitement. Ne pas jeter la batterie au feu. Ne pas la démonter ni tenter de la recharger.

Couvercle

Pour ajouter des cartes, de la mémoire, ou des unités de stockage internes, vous devrez démonter le couvercle de l'unité système Sun. Ne pas oublier de remettre ce couvercle en place avant de mettre le système sous tension.



Attention: – Ne pas ouvrir. Technicien de maintenance qualifié uniquement. Si l'on néglige cette précaution, on encourt des risques de blessures corporelles et de dégâts matériels.

Conformité aux certifications Laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

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Attention: – L'utilisation de contrôles, de réglages ou de performances de procédures autre que celle spécifiée dans le présent document peut provoquer une exposition à des radiations dangereuses.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.
- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:



Precaución – Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.



Precaución – Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.



Precaución – Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:



Encendido – Aplica la alimentación de CA al sistema.



Apagado - Elimina la alimentación de CA del sistema.



En espera – El interruptor de Encendido/En espera se ha colocado en la posición de En espera.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun



Precaución – Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamientos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.



Precaución – De acuerdo con la norma DIN 45 635, Parte 1000, se admite un nivel de presión acústica para puestos de trabajo máximo de 70Db(A).

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada/salida cumple los requisitos de la normativa SELV.

Conexión del cable de alimentación eléctrica



Precaución – Los productos Sun están diseñados para trabajar en una red eléctrica monofásica con toma de tierra. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.



Precaución – No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.



Precaución – Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.



Precaución – Para eliminar completamente la alimentación de esta unidad, desconecte todos los cables de alimentación.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":



Precaución – El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

Batería de litio



Precaución – En las placas de CPU Sun hay una batería de litio insertada en el reloj de tiempo real, tipo SGS Núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, o MK48T08. Las baterías no son elementos reemplazables por el propio cliente. Pueden explotar si se manipulan de forma errónea. No arroje las baterías al fuego. No las abra o intente recargarlas.

Tapa de la unidad del sistema

Debe quitar la tapa del sistema cuando sea necesario añadir tarjetas, memoria o dispositivos de almacenamiento internos. Asegúrese de cerrar la tapa superior antes de volver a encender el equipo.



Precaución – No abrir. Sólo personal de servicio cualificado. Si no se tiene en cuenta esta precaución, se pueden ocasionar daños personales o perjudicar el funcionamiento del equipo.

Aviso de cumplimiento con requisitos de láser

Los productos Sun que utilizan la tecnología de láser cumplen con los requisitos de láser de Clase 1.

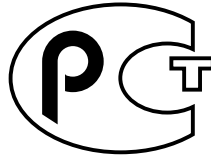
Class 1 Laser Product
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Precaución – El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark



Nordic Lithium Battery Cautions

Norge



ADVARSEL – Litiumbatteri —
Ekspløsjonsfare. Ved utskifting benyttes kun
batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

Sverige



VARNING – Explosionsfara vid felaktigt
batteribyte. Använd samma batterityp eller
en ekvivalent typ som rekommenderas av
apparatillverkaren. Kassera använt batteri
enligt fabrikantens instruktion.

Danmark



ADVARSEL! – Litiumbatteri —
Ekspløsjonsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme
fabrikat og type. Levér det brugte batteri
tilbage til leverandøren.

Suomi



VAROITUS – Paristo voi räjähtää, jos se on
virheellisesti asennettu. Vaihda paristo
ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan
ohjeiden mukaisesti.
