

# OCTANE™ Duo Installation Guide

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OCTANE™ Duo Installation Guide  
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# Introduction

This guide tells you how to install the Duo upgrade in the OCTANE workstation. The Duo upgrade allows two users to use the same workstation simultaneously. It also includes information on using the Duo system, removing parts, and troubleshooting. The guide is organized as follows:

- The Introduction provides additional hardware information, software and system administration information, product support information, and instructions on placement of a regulatory label.
- Chapter 1 provides instructions for installing the software, shutting down the OCTANE workstation, and preparing for the Duo upgrade tasks.
- Chapter 2 provides instructions for removing the front bezel and installing an option drive.
- Chapter 3 provides instructions for removing the system module and installing and removing memory.
- Chapter 4 provides instructions for installing the PCI board and PCI module.
- Chapter 5 provides information about removing the PCI module and board.
- Chapter 6 provides information about installing and removing the second graphics board.
- Chapter 7 provides instructions for installing the second monitor, keyboard, and mouse.
- Chapter 8 provides instructions for configuring the system and verifying the installations.
- Chapter 9 provides instructions for using the Duo system.
- Chapter 10 provides troubleshooting information.
- Appendix A provides illustrations of OCTANE XIO graphics boards and the back of the workstation.
- Appendix B provides information about the care and cleaning of the compression connectors.

- Appendix C provides programming tips.
- Appendix D provides PCI configuration information.

It's always a good idea to back up your system before upgrading your system. If you have not backed up your system recently, do so now. For instructions on backing up your system, see the online *Personal System Administration Guide*.

For additional information about the Duo system over the Web, open a Web browser and type: `http://www.sgi.com/octane/duo`.

## Additional Hardware Information

*OCTANE Hardware Central* is an online resource that provides access to hardware movies and other information previously found only in your printed owner's guide, such as port pinout information, user tips, environmental information, and so on. To access it:

1. Choose Toolchest > Selected > File QuickFind.
2. When the window appears, type `insight` and press `Enter`.
3. When the IRIS InSight bookshelf appears, choose *OCTANE Hardware Central* from the SGI End\_User bookshelf.

Or, access it through your Web browser. In the location window, type `file:/usr/share/Insight/library/SGI_bookshelves/SGI_EndUser/books/Octane_HWCntl/index.html` and press `Enter`.

*OCTANE Hardware Movies* show OCTANE option boards being installed and removed. The hardware movies are found in *OCTANE Hardware Central*.

## Hardware Configurations

A listing of available configurations (upgrades and options) is available on the Web. In the location window, type `http://www.sgi.com/Products/hardware/desktop/products/configurator/configurator.html`.

## Technical Publications Library

A copy of this manual, as well as other Silicon Graphics technical publications, is found in the Technical Publications Library. To access this library, open your Web browser and enter <http://techpubs.sgi.com/library/>.

## Dual Head System

Should you choose to use your Duo system as a Dual Head system (instead of a Duo), see , Chapter 8, “Changing to a Dual Head System” on page 125, and then see the *OCTANE Dual Head Installation Guide*. The Dual Head system provides one user with two monitors with different graphical images. The manual can be found over the Web in the Technical Publications Library. See the section in this introduction, “Technical Publications Library” on page xix, for the url.

## Software and System Administration Information

For complete information on installing software, see the online *Personal System Administration Guide*. It is located on your desktop in the Toolchest > Help> Online Books. For more advanced information, see the online *IRIX Admin: Software Installation & Licensing Guide*. For system administration information, see the SGI\_Admin section of the online bookshelf.

## Product Support

The OCTANE workstation is designed so that you can maintain and repair the workstation without the help of a trained technician. Contact your Silicon Graphics subsidiary or authorized distributor for information about product support.

Silicon Graphics, Inc., provides a comprehensive range of product support for its products. If you are in North America and would like support for your Silicon Graphics supported products, contact the Technical Assistance Center at 1-800-800-4SGI or your authorized service provider. If you are outside North America, contact the Silicon Graphics subsidiary or authorized distributor in your country.



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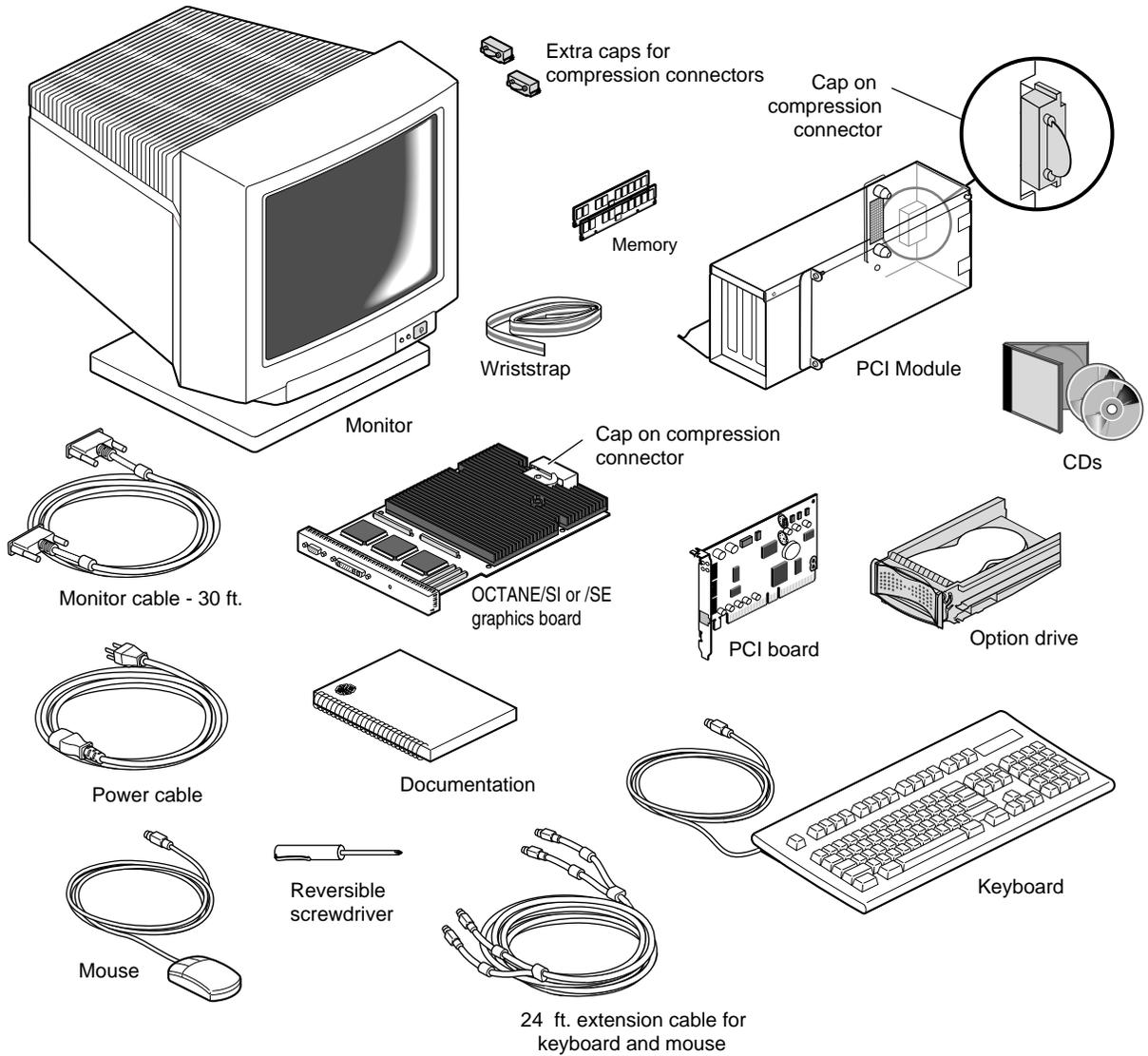
## Getting Started

This chapter tells you how to shut down the OCTANE workstation and prepare for the tasks included in the Duo upgrade. The tasks are organized by chapter to simplify the Duo installation.

The tasks in this chapter include

- “Checking Your Shipment” on page 2.
- “Installing the Software” on page 3.
- “Placement of a Regulatory Label” on page 5.
- “Removing the Lockbar and Cables” on page 6.
- “Attaching the Wrist Strap” on page 8.

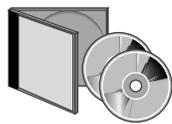
## Checking Your Shipment



**Figure 1-1** Checking Your Shipment

It is always a good idea to check your shipment when you receive it.

## Installing the Software



CDs

**Figure 1-2** Duo CDs

Install the software before you install the hardware. After the software and hardware are installed, Chapter 8 provides system set up and verification instructions.

The software installation process for the Duo upgrade requires that you:

- install patch software
- back up the Xserver file
- enable the Duo software

Read relevant fliers and the Duo release notes before installing the software. The README file on the Duo CD tells you where to find the release notes (OCTANE CADDuo Issues). It also tells you about the appropriate patches to install. The CD booklet provides detailed instructions for reading the release notes and installing the software.

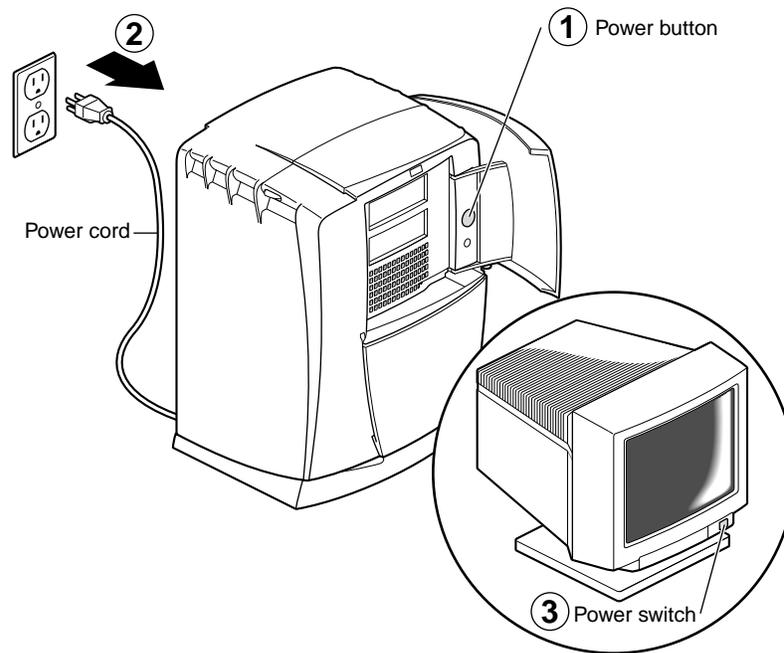
**Note:** Always perform administrative tasks from the primary head, head 0.

After installing the software from the Duo CD, back up the Xserver file, enable the Duo software, and replace the default login screen. Follow these instructions:

1. From the Toolchest > Desktop, open a UNIX shell.
2. At the prompt, type `cp /var/X11/xdm/Xserver /var/X11/xdm/Xserver.orig`.
3. At the prompt, type `cp /var/X11/xdm/Xserver.2key /var/X11/xdm/Xserver`.
4. Become superuser by typing `su`.
5. Type `chkconfig visuallogin off`
6. Type `exit` to exit superuser mode.
7. Restart the system. The new login screen appears.

You are ready to begin the hardware installation.

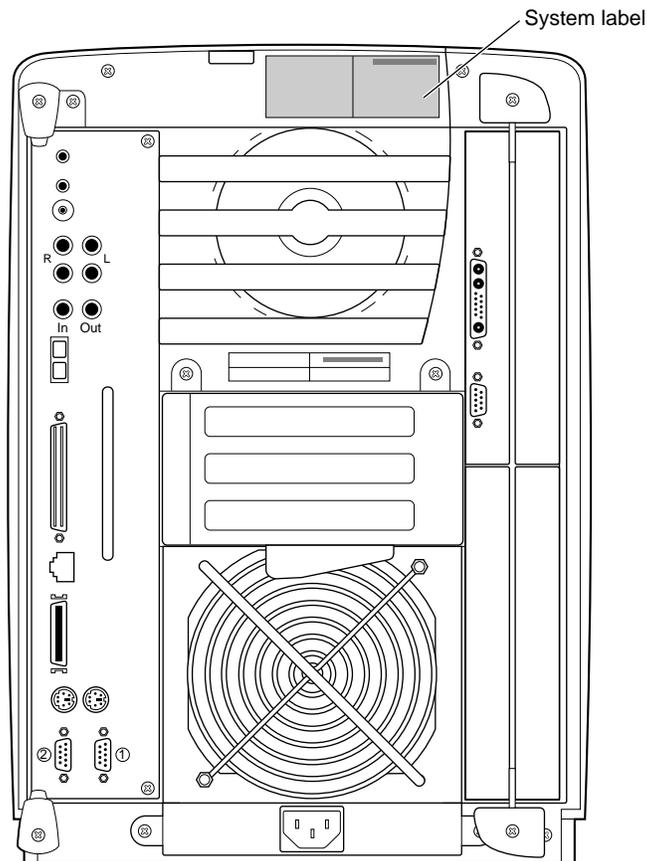
## Preparing the Workstation



**Figure 1-3** Powering Off the OCTANE Workstation

1. Open the cover and push the power button once to power off the OCTANE workstation.
2. Unplug the power cord.
3. Power off the monitor by pressing the monitor power switch.

## Placement of a Regulatory Label

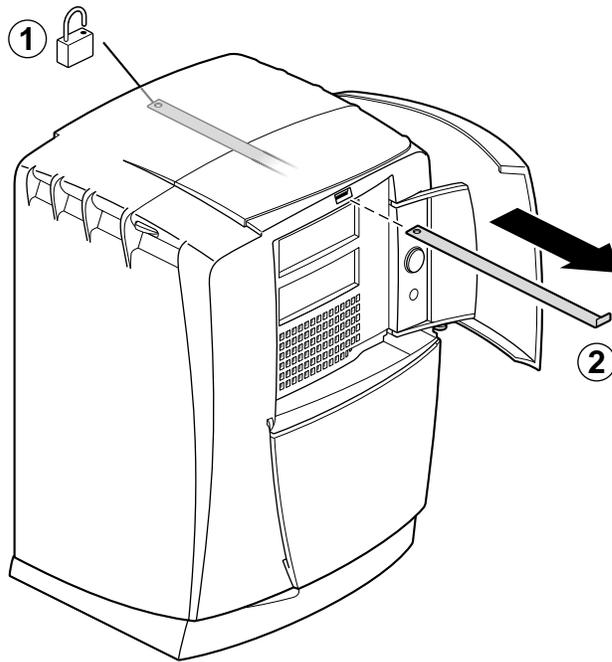


**Figure 1-4** Locating the System Label

If you received a system upgrade label, place it on the system label.

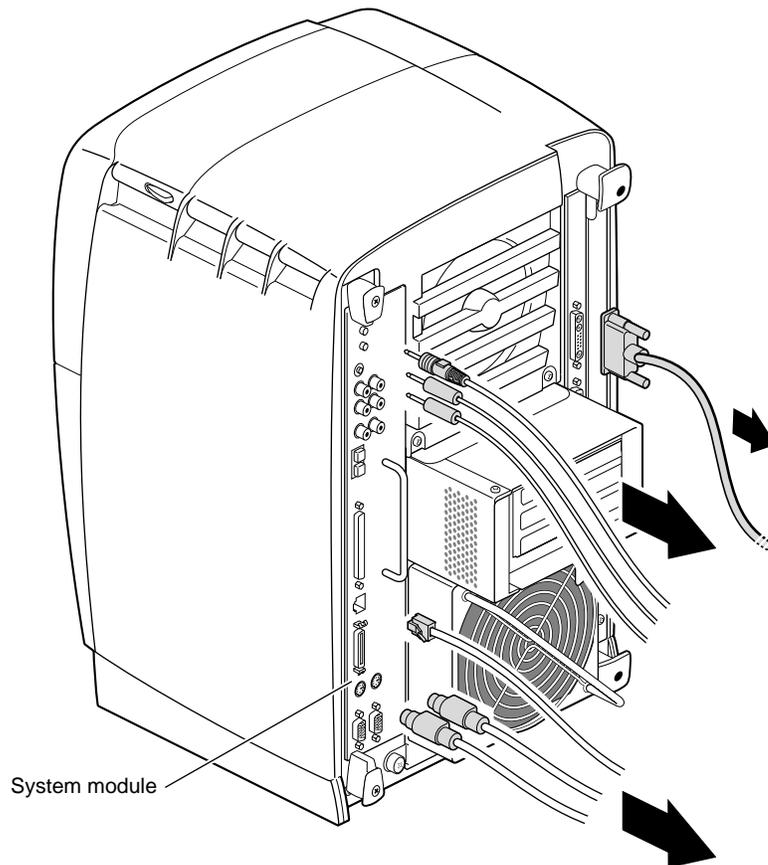
1. Face the back of the OCTANE workstation. The system label (containing the model/CMN number) is located at the top center of the back of the workstation.
2. Place the label over the VCCI and CISPR 22 information.

## Removing the Lockbar and Cables



**Figure 1-5** Removing the Lockbar

1. If present, remove the lockbar that locks the system module and bezel to the chassis.
  - Unlock the lock at the back of the OCTANE workstation.
  - Pull the lockbar out of the OCTANE workstation.

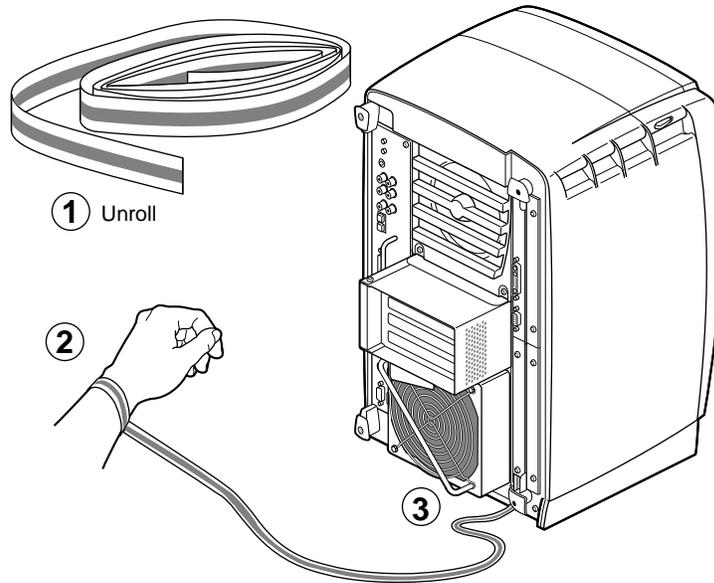


**Figure 1-6** Removing the Cables

2. Remove all the cables from the back of the workstation. (Not all cables are shown.)

For illustration purposes, the PCI module is shown installed.

## Attaching the Wrist Strap



**Figure 1-7** Attaching the Wrist Strap

**Caution:** The components inside the OCTANE workstation are extremely sensitive to static electricity; you must wear the wrist strap while replacing parts inside the workstation.

1. Unroll the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.
2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to the XIO module, or, use any convenient and exposed electrical ground, such as a metal part of the OCTANE workstation.
4. Keep the wrist strap attached while you are installing parts of the Duo shipment.

Go to Chapter 2 to begin your next task, installing memory.

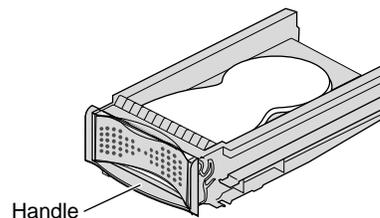
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## Installing and Removing an Option Drive

This chapter provides the following information and instructions:

- “About Internal Drives” on page 10.
- “Removing the Bezel” on page 10.
- “Sliding In an Internal Option Drive” on page 12.
- “Removing the Blank Panel” on page 15.
- “Removing Internal Option Drives” on page 17.
- “Replacing a Blank Panel” on page 18.
- “Replacing the Bezel” on page 20.

### Collecting the Drive Materials



**Figure 2-1** Materials for the Option Drive Installation

For this portion of the Duo installation, you need just the option drive.

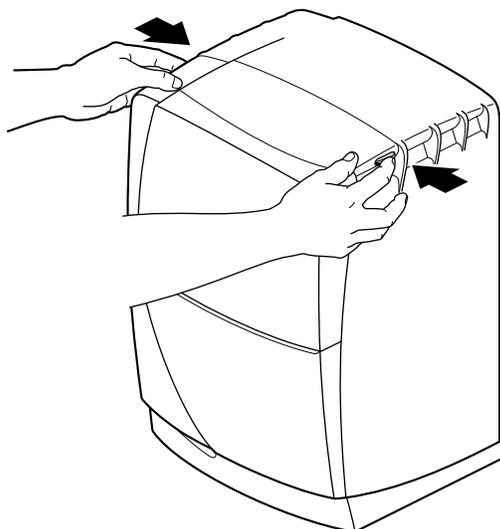
**Note:** The wrist strap you attached in Chapter 1 should remain in place until all tasks are complete.

### About Internal Drives

- Unsupported devices may not work with the OCTANE workstation, and may cause problems with supported products.
- All internal drives have a 3.5-inch form factor.

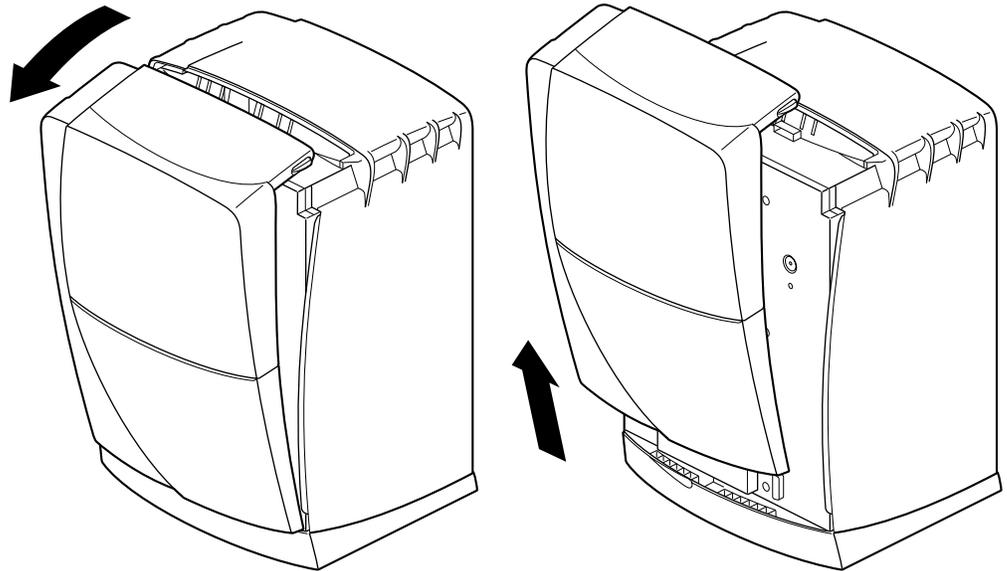
**Caution:** Drives are easily damaged. Handle your drive carefully; do not drop it or handle it roughly.

### Removing the Bezel



**Figure 2-2** Pressing the Bezel Release Buttons

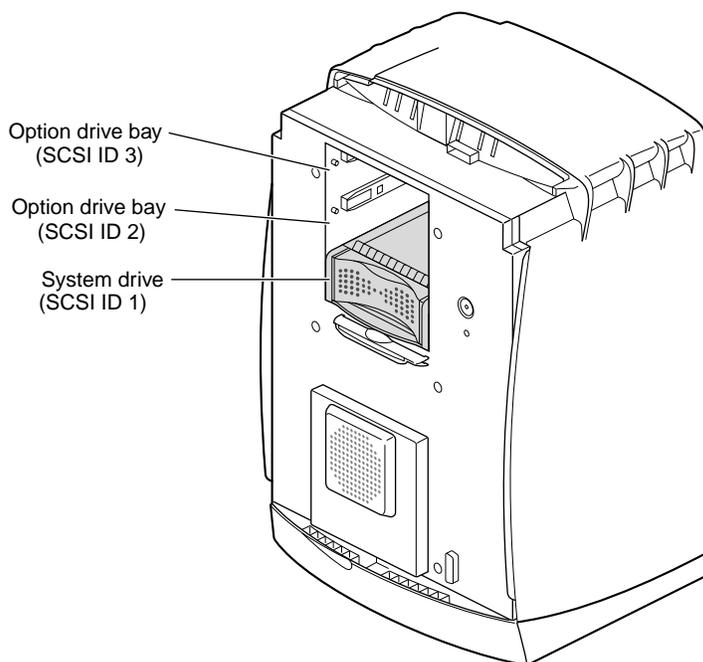
1. Press both bezel release buttons.



**Figure 2-3** Removing the Bezel

2. Remove the bezel by tilting it forward, then lifting it from its release hooks at the bottom.

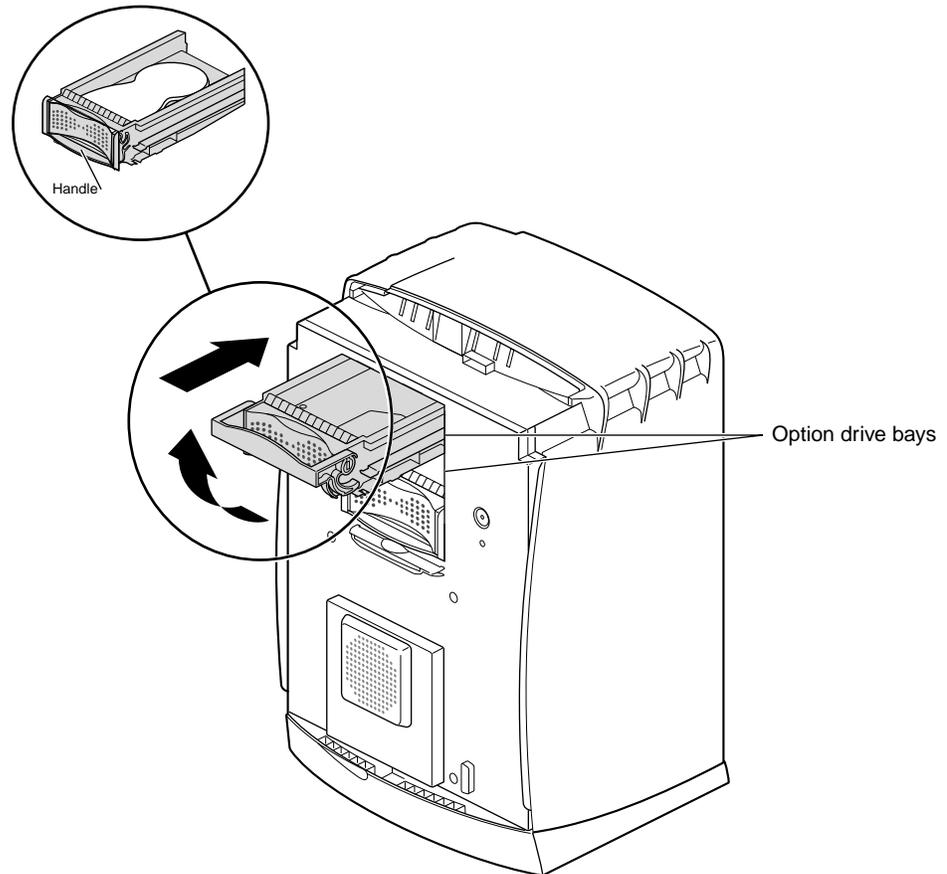
## Sliding In an Internal Option Drive



**Figure 2-4** Identifying the Option Drive Bays

The option drive bays are the two top drive bays. Install an option drive in either one.

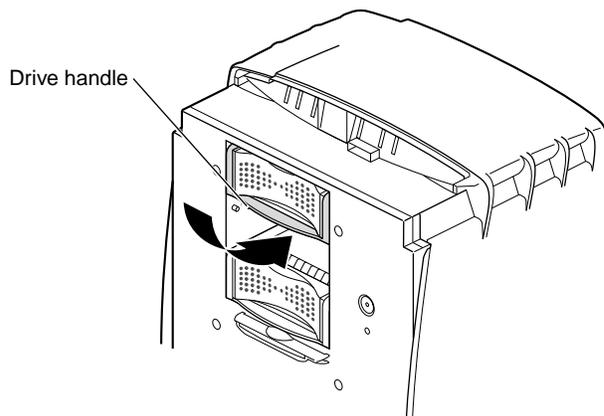
The OCTANE workstation automatically assigns an address to an internal drive. The system drive is SCSI ID 1, the drive directly above it is SCSI ID 2, and the upper option drive is SCSI ID 3.



**Figure 2-5** Sliding In an Option Drive

1. Lift the handle on the drive to a horizontal position, and slide the drive into the drive bay.
2. Slide the drive in gently until you feel solid resistance. The drive is connected to the frontplane when the front of the drive is flush with the chassis.

**Caution:** Pushing the drive into the frontplane with force can damage the drive.

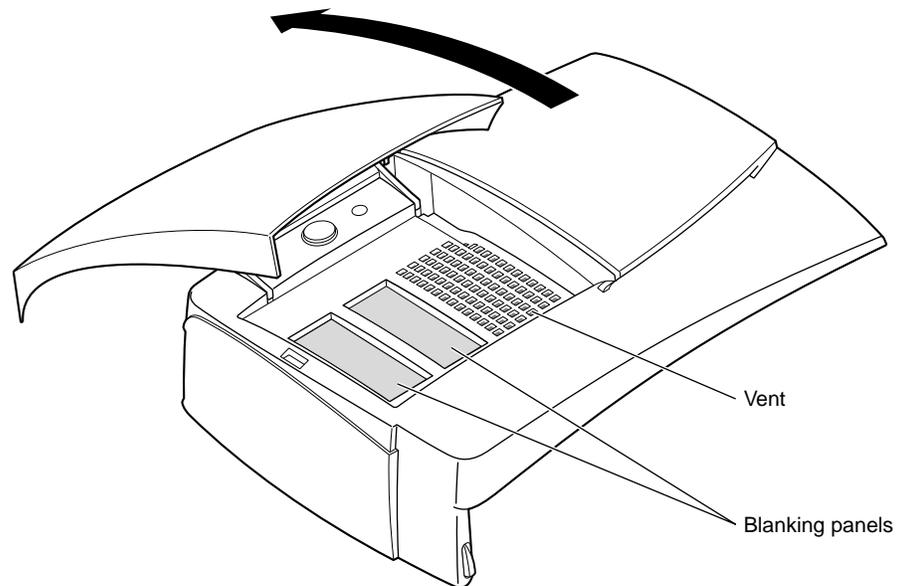


**Figure 2-6** Locking the Drive

3. With the drive completely inserted, rotate the handle downward to lock the drive in the workstation.

You have completed installing an option drive and are ready to remove the blank panel on the bezel.

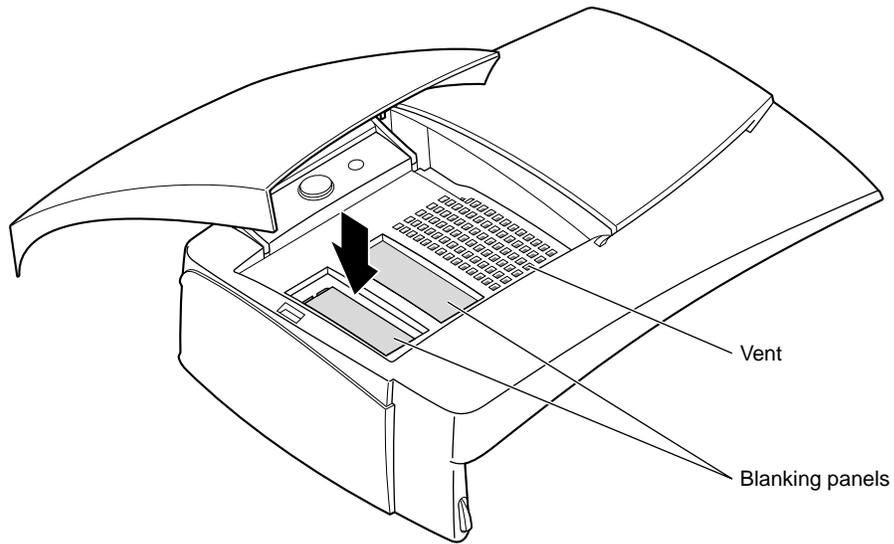
## Removing the Blank Panel



**Figure 2-7** Opening the Door on the Bezel

This section shows you how to remove a blank panel from the bezel.

1. Place the bezel on a flat surface so that the door is facing up.
2. Open the door.
3. Locate the blanking panel for the slot in which you installed the option drive.



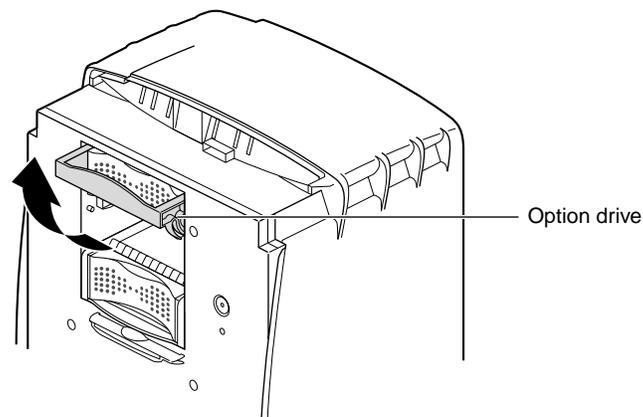
**Figure 2-8** Pushing the Blank Panel Free

4. Press down on the blanking panel. It pops out the back of the bezel.
5. Keep the blanking panel. You must replace it if you ever remove the drive.

**Caution:** To prevent damage to your OCTANE workstation, you must place a blanking panel in the bezel if you have removed a drive. The blank panel ensures proper airflow through the workstation.

6. Go to “Replacing the Bezel” on page 20.

## Removing Internal Option Drives

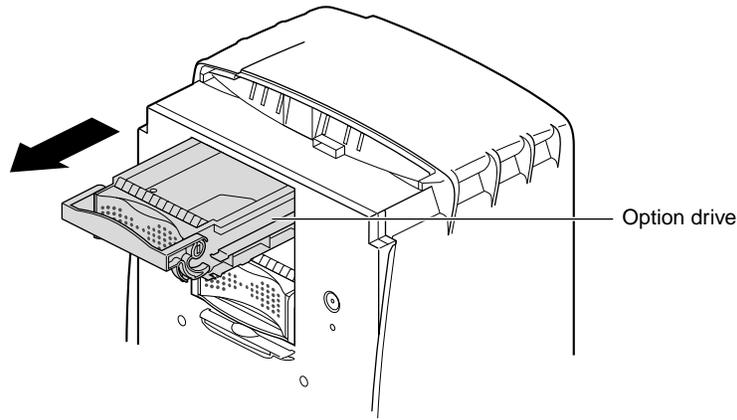


**Figure 2-9** Lifting the Drive Handle to Unlock the Drive

Before removing an internal drive, you must unmount your drive. For more information, go to the Toolchest > Help > Online Books > End User bookshelf, choose the *Personal System Administration Guide*, and search for "Removing a Disk."

After you have unmounted the drive, power off the workstation and remove the bezel. If you have not already done these tasks, go to Chapter 1 and follow all of the instructions in that chapter and this one until you get to this section.

1. Lift the drive handle to unlock the drive.



**Figure 2-10** Sliding Out the Option Drive

2. Pull the drive directly toward you to remove it from the drive bay.

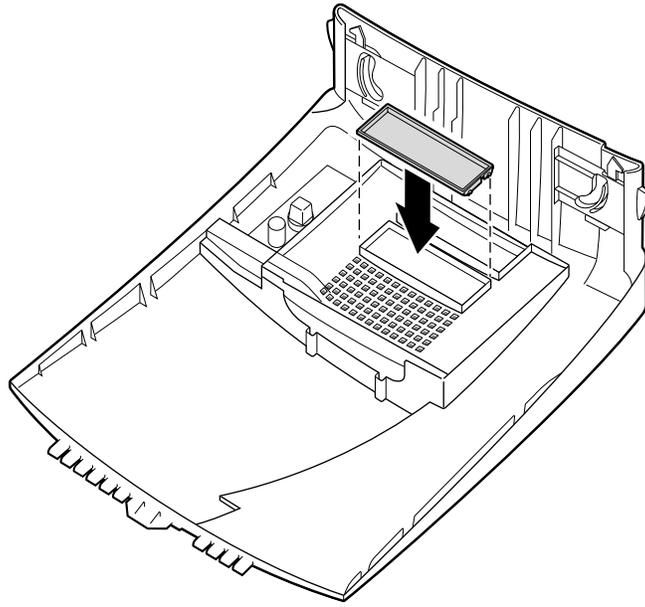
To install a drive in the option drive slot, go to “Sliding In an Internal Option Drive” on page 12.

To leave the drive bay empty, replace the blank panel before replacing the bezel. Go to the next section, “Replacing the Bezel.”

## Replacing a Blank Panel

If you removed a secondary drive and do not intend to replace it, you must replace the blank panel.

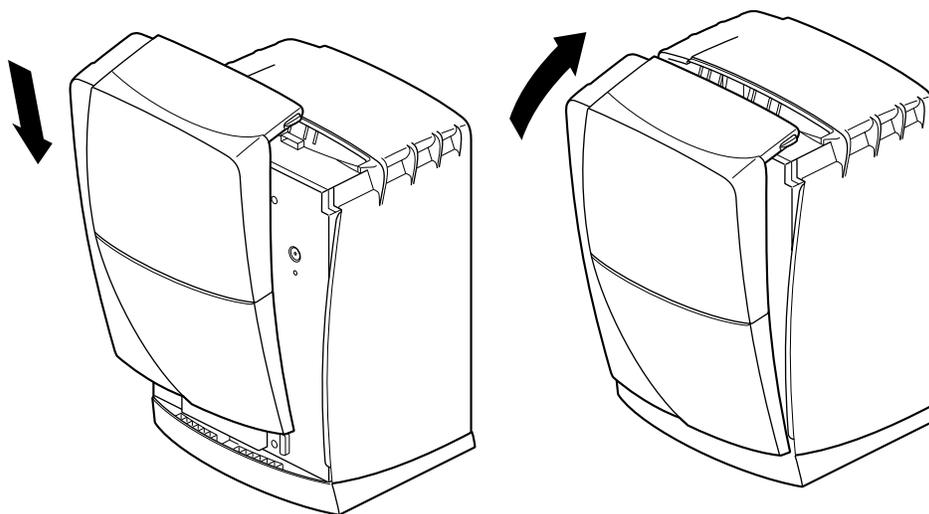
1. Place the bezel face down on the flat surface with the door closed. (Place the bezel on a protective surface to prevent the bezel from being scratched.)
2. Locate the slot in which you want to place the blank panel and place the panel in it.



**Figure 2-11** Pushing the Blank Panel Free

3. Press the blank panel until both sides snap firmly into place.

## Replacing the Bezel



**Figure 2-12** Replacing the Bezel

Replace the bezel.

1. Lower the bezel into the lower edge of the chassis.
2. Hook the bezel in place.
3. Rotate the bezel back and into closed position.

You can hear the latches snap into place when the bezel is fully installed.

You have finished installing the option drive.

Your next task is to install memory. Go to Chapter 3 for installation instructions.

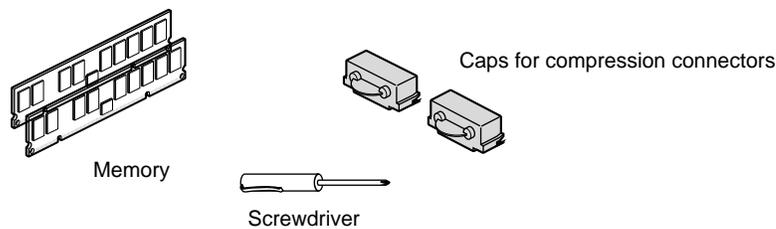
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## Installing and Removing Memory

This chapter provides the following information and instructions:

- “Removing the System Module” on page 22.
- “About Memory” on page 28.
- “Installing Memory” on page 31.
- “Removing Memory” on page 32.
- “Replacing the System Module” on page 33.

### Collecting the Materials for the Memory Installation

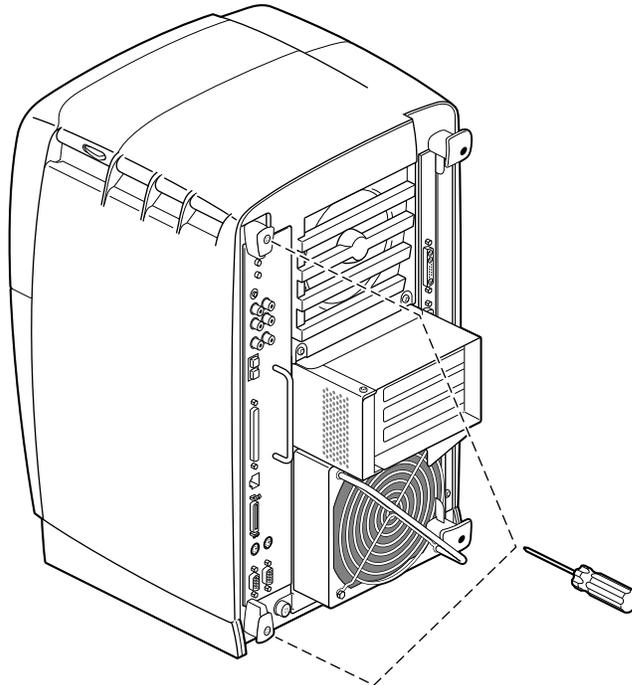


**Figure 3-1** Materials for the Memory Installation

1. For this portion of the Duo installation, collect the following parts:
  - The additional memory. The OCTANE Duo system requires a minimum of 256 MB of memory.
  - Compression caps for the two compression connectors on the back of the system module. (These came with your original workstation shipment.)
  - A Phillips head screwdriver.

**Note:** The wrist strap you attached in Chapter 1 should remain in place until all tasks are complete.

## Removing the System Module



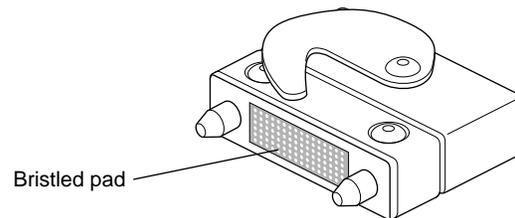
**Figure 3-2** Removing the System Module Screws



**Warning:** The heat sinks on the CPU and system module become very hot. Wait five minutes after powering off the OCTANE workstation before you remove the system module. Test before touching the CPU or heat sinks.

1. Loosen the captive screws that hold the sliding handles to the OCTANE workstation. See Figure 3-2.

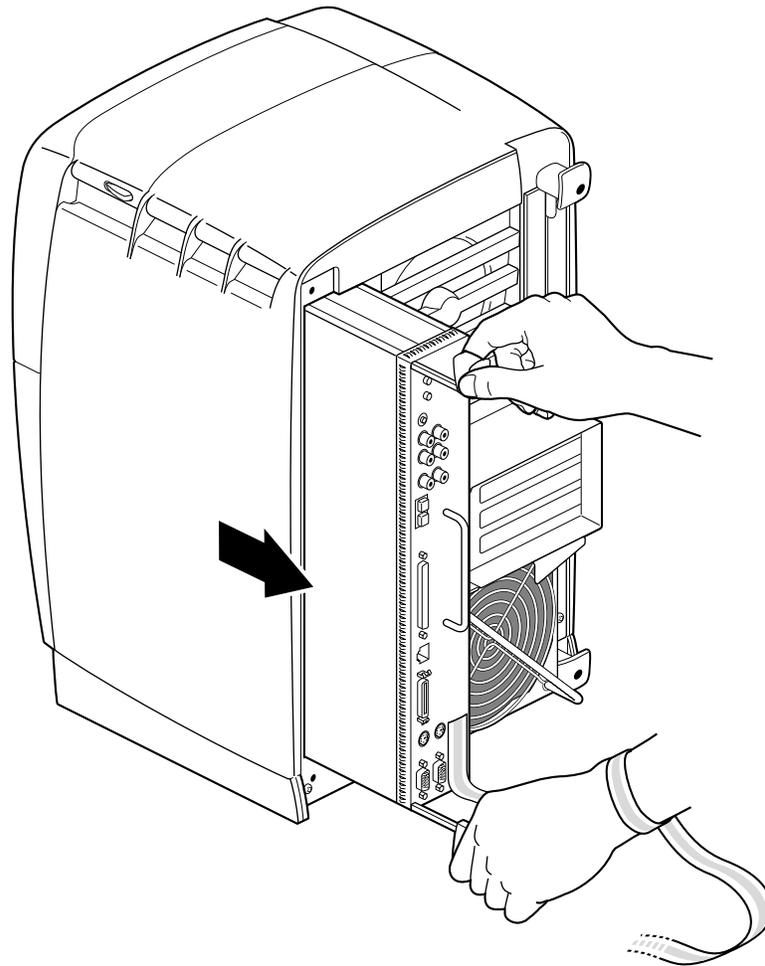
For illustration purposes, the optional PCI module is shown installed.



**Figure 3-3** Identifying the Compression Connectors

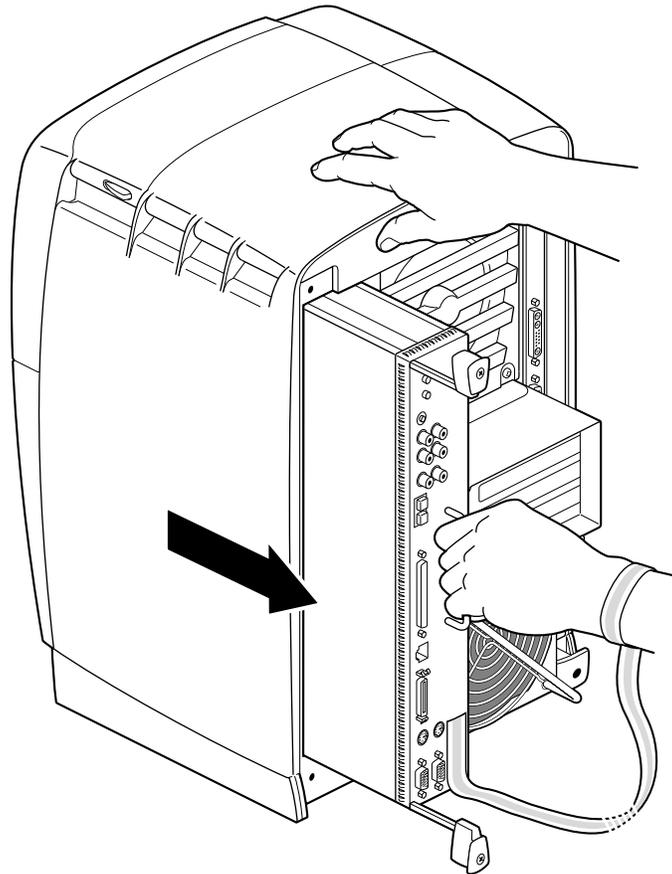
Compression connectors are very delicate. Before you remove the system module, be aware that these connectors are on the side opposite the handles. This section tells you about them so that you are aware of their location and delicacy before you remove the system module.

**Caution:** The gold bristled pad on the compression connectors on the back of the system module is very delicate and easily damaged. Before you remove the system module, read Appendix B, “Care and Cleaning of the Compression Connectors.”



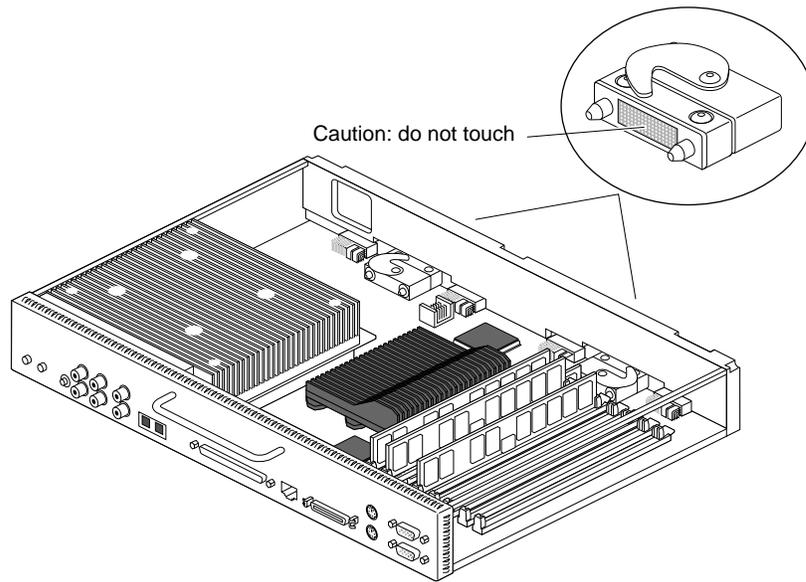
**Figure 3-4** Releasing the System Module

2. Pull both sliding handles simultaneously until they are completely extended. This action releases the system module from the workstation.



**Figure 3-5** Removing the System Module From the Chassis

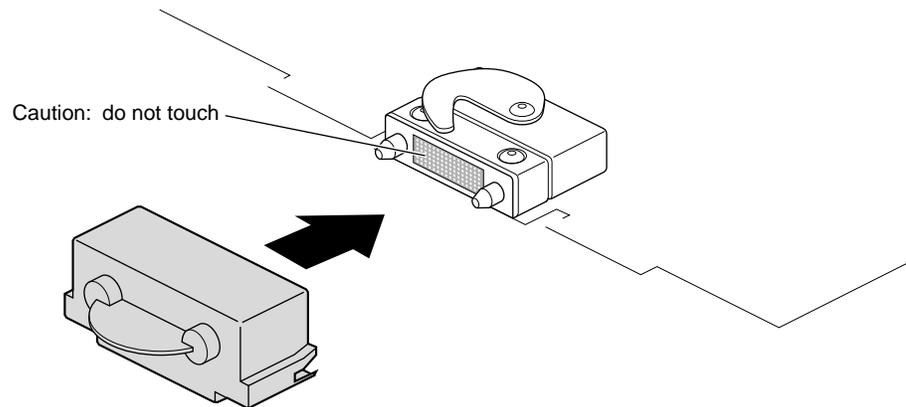
3. Pull the system module from the chassis by grasping the module handle with your left hand and bracing your right hand against the top of the workstation. Support the bottom of the module as you pull it out.
4. Place it on a dry, antistatic surface with the CPU and DIMMs facing up. Your desktop works well.



**Figure 3-6** Locating the Compression Connectors

**Caution:** Do not touch the compression connectors as you remove the system module. The side of the compression connector that connects to the workstation is extremely delicate.

See Appendix B for information and care of the compression connectors.



**Figure 3-7** Placing the Compression Cap on the Compression Connector

5. Place a cap on each compression connector on the back of the system module.



**Warning:** The heat sinks on the CPU and system module become very hot. Wait five minutes after powering off the workstation before touching them, and then test before touching them.

## About Memory

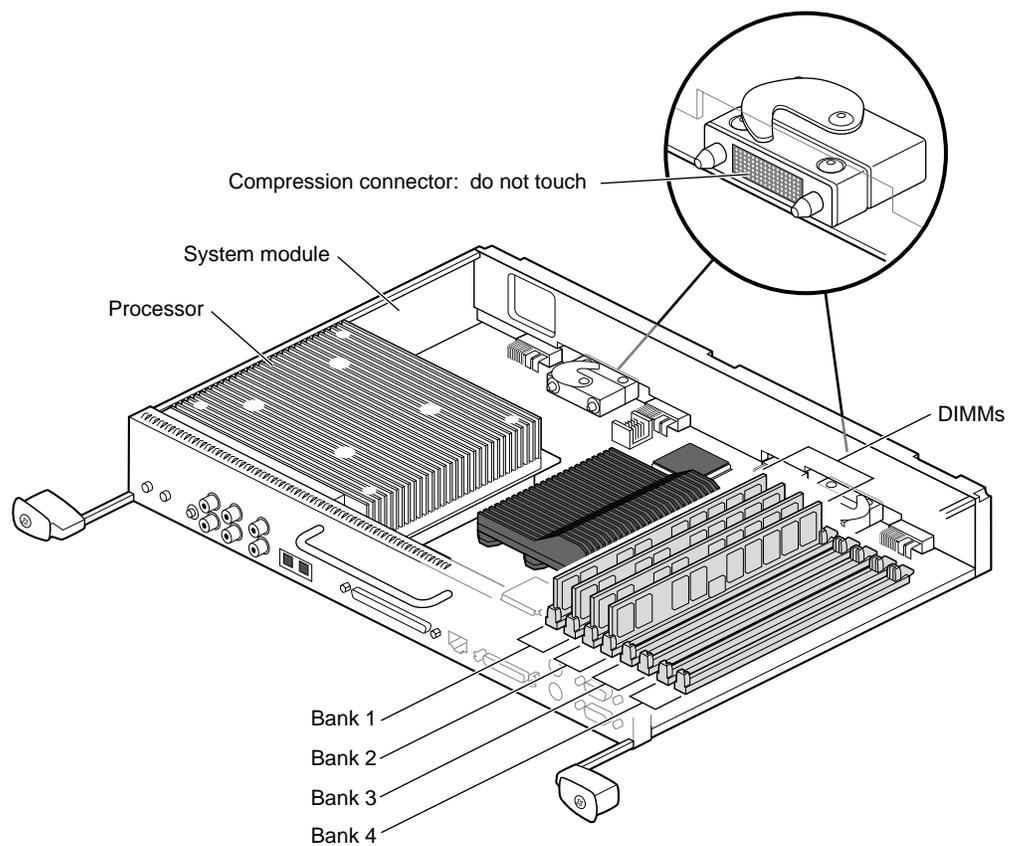
Before you install DIMMs in your OCTANE workstation, read the following information.

- Bank 1 (sockets 1 and 2) must always be filled.
  - Minimum memory configuration is 64 MB in a bank (2 x 32 MB DIMM).
  - Maximum configuration is 512 MB in a bank (2 x 256 MB DIMM).
- Banks are filled sequentially; when bank 1 is full, fill bank 2. Do not skip banks.
- Each bank is either empty or contains two DIMMs, one in each of the two sockets.
- Each banks of DIMMs must contain two DIMMs of the same capacity or density and of the same type.

Capacity refers to the number of megabytes in a DIMM: 32, 64, 128, and so on.

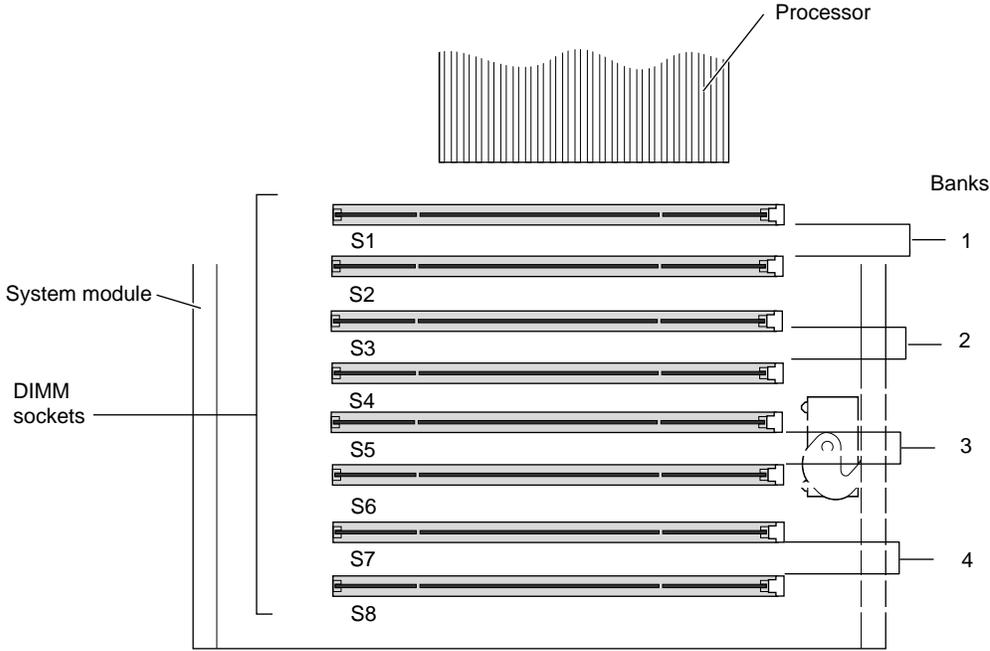
Type refers to the construction of the DIMM. Because DIMM construction cannot be determined visually, it is important to know that two DIMMs are the same type before you begin installation. If you insert two DIMMs of different types, the system will not work. Banked DIMMs and stacked DIMMs are two examples of many different types of memory.

- SGI DIMMs have color-coded labels with a part number in the middle of the label:
  - The 32 MB DIMM has a yellow label.
  - The 64 MB stacked DIMM has a blue label.
  - The 64 MB DIMM (not stacked) has a green label.
  - The 128 MB DIMM has a brown label.
  - The 256 MB stacked DIMM has a red label.
- Minimum memory capacity in the OCTANE workstation is 64 MB (2 x 32 MB DIMMs).
- Maximum memory capacity in the OCTANE workstation is 2 GB (8 x 256 MB DIMMs).



**Figure 3-8** Locating DIMMs on the System Module

The DIMM banks are located on the system module, as shown in Figure 3-8.

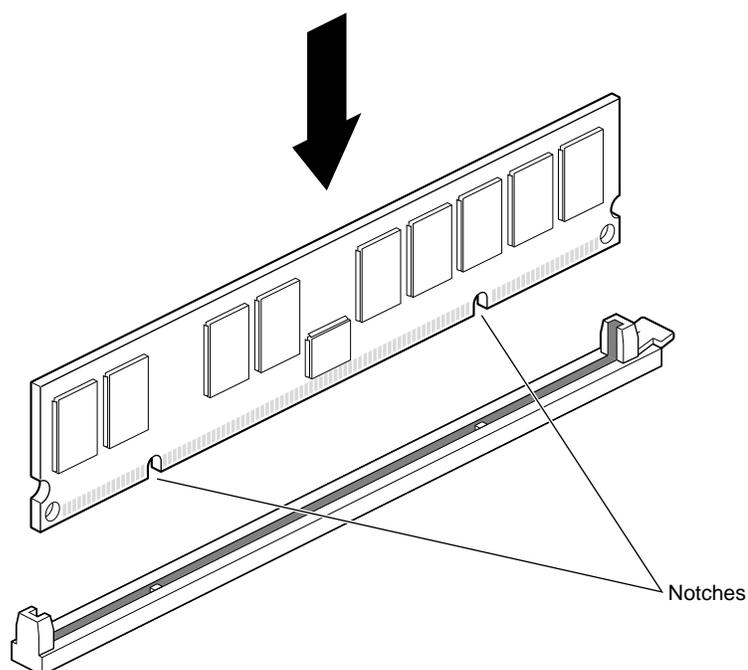


**Figure 3-9** Identifying DIMM Sockets and DIMM Banks

DIMM sockets are labeled between sockets, as shown in Figure 3-9.

## Installing Memory

**Caution:** Dual inline memory modules (DIMMs) are extremely sensitive to static electricity. Handle the DIMMs carefully and wear the wrist strap to avoid conducting static electricity.



**Figure 3-10** Locating the Notches on a DIMM

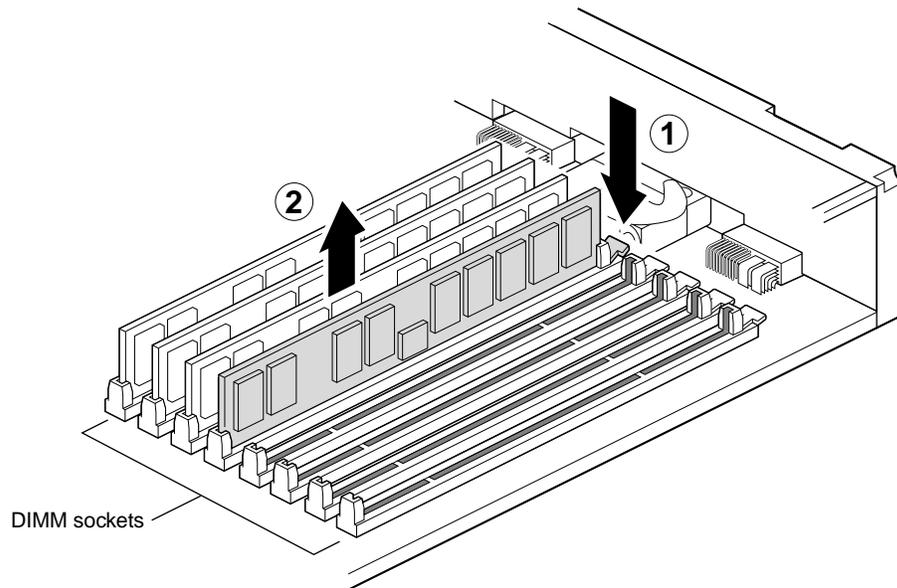
DIMMs are notched on the bottom so that they cannot be inserted incorrectly.

1. Insert the DIMM into the socket. Push firmly; you may need to use some force. You hear a click as it is seated, and the latch on the end of the socket moves up.
2. Install the second DIMM in its socket. DIMMs must be installed in pairs.
3. Check to be sure both sockets in the bank are full.

You have finished installing memory and are ready to replace the system module. Go to “Replacing the System Module” on page 33.

## Removing Memory

To remove memory, go to Chapter 1 and follow the instructions in that chapter. Then go to the beginning of this chapter, and follow the instructions for removing the system module.



**Figure 3-11** Removing a DIMM

1. With the system module lying on a flat, dry, antistatic surface, locate the DIMM banks and sockets as shown in Figure 3-9 and Figure 3-8.
2. Locate the DIMMs you want to remove.

**Caution:** Do not touch the connector near the DIMM removal levers.

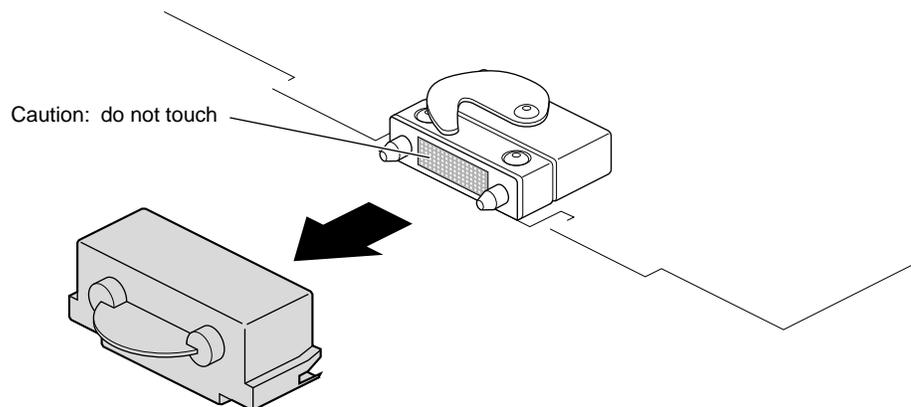
3. Remove the DIMMs.

- Press down on the latch at the end of the DIMM socket. The DIMM partially ejects from the socket.
- Remove the DIMM.

**Note:** DIMMs must be in pairs of two (two in each bank) for the system to function. Either remove two DIMMs, or remove one and replace it.

4. To install a new DIMM, see “Installing Memory” on page 31. To replace the system module, see “Replacing the System Module” on page 33.
5. When you are finished with your tasks in this chapter:
  - Remove the wrist strap.
  - Skip to Chapter 7, page 107 for instructions on replacing the cables and powering on the OCTANE workstation.

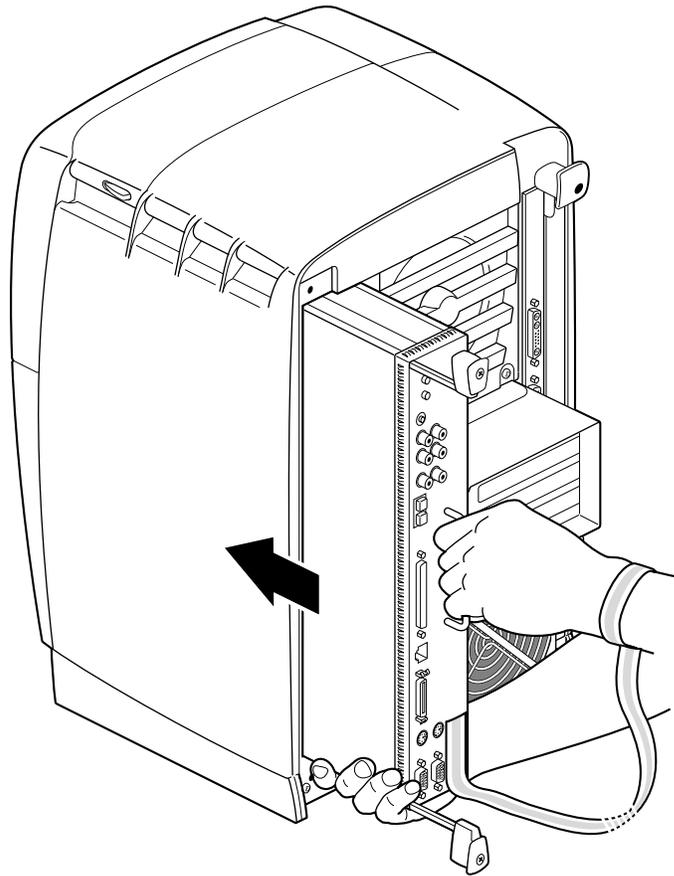
## Replacing the System Module



**Figure 3-12** Removing the Compression Connector Caps

1. Remove the caps on the compression connectors on the back of the system module. Do not touch the system module compression connectors as you lift the module into the workstation.

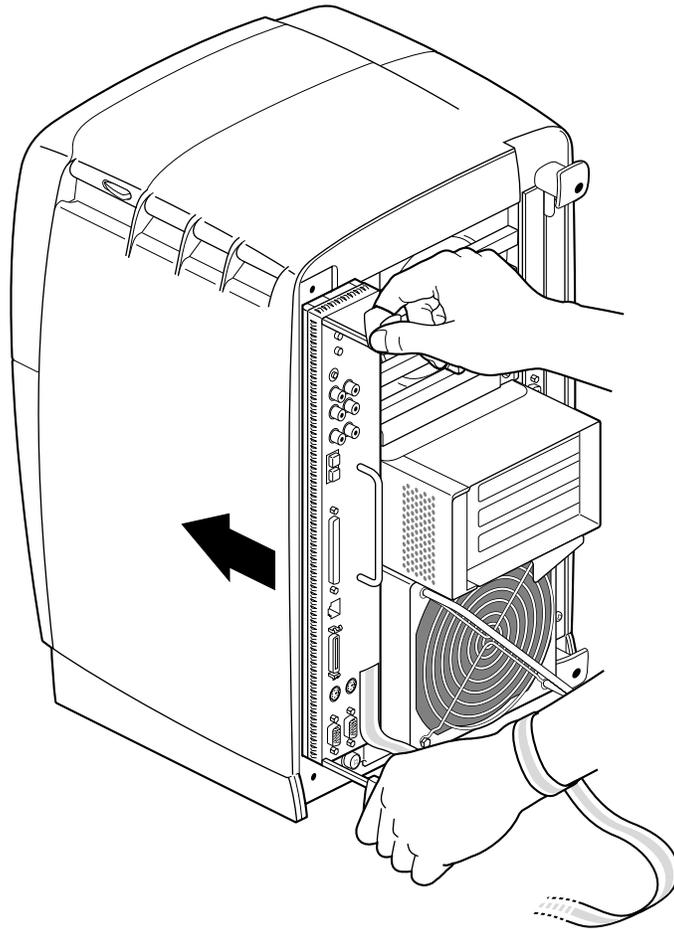
**Caution:** To avoid damage to your OCTANE workstation, the power cord must be unplugged from the electrical socket before your insert the system module.



**Figure 3-13** Supporting the System Module

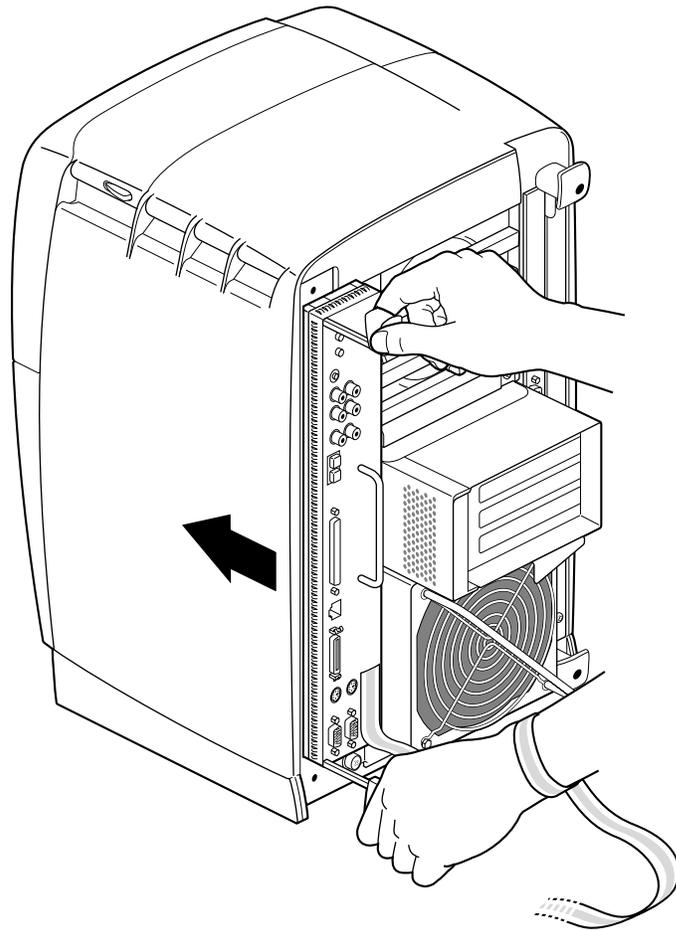
2. Grasp the system module by its stationary handle and support it with one hand as you slide it into the chassis.
3. Push the module firmly and completely into the chassis using the stationary handle. (Both sliding handles protrude.) The insertion requires some force. The system module stops when it is slightly out of the chassis.

The system module must be almost completely inserted before the hooks on the ends of the sliding handles can attach to the workstation and completely seat the compression connectors.



**Figure 3-14** Replacing the System Module in the OCTANE Workstation

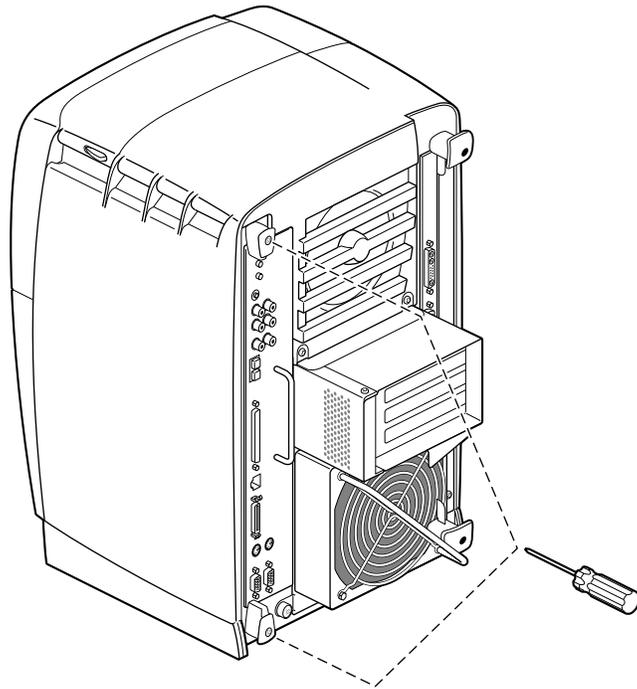
4. Push the sliding handles simultaneously to connect the system module to the workstation.



**Figure 3-15** Locking the System Module to the Workstation

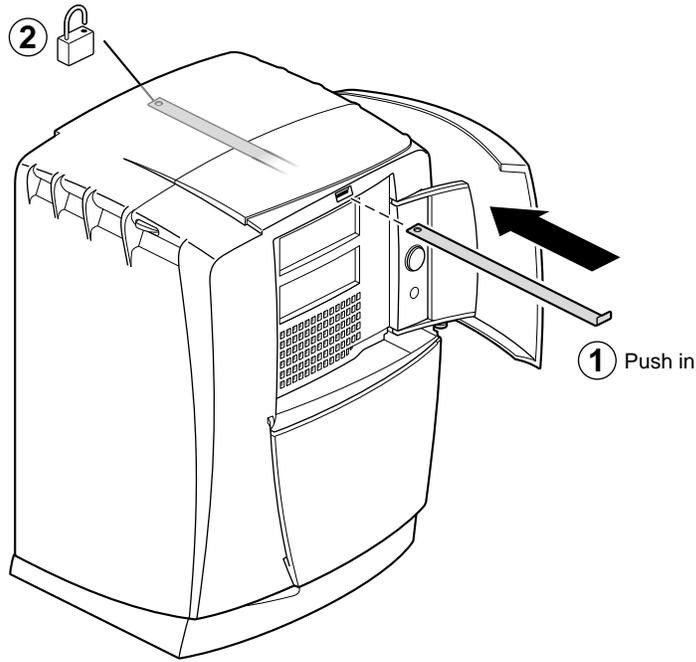
5. Push firmly on the handles to completely lock the system module to the workstation. (If the sliding handles won't lock, use the stationary handle to push the system module further toward the workstation. The hooks on the ends of the moveable handles must attach to the workstation for seating to be complete.)

When the system module is fully seated and locked to the workstation, the handles are completely recessed and the system module is flush with the chassis.



**Figure 3-16** Replacing the System Module Screws

6. Tighten the captive screws in the sliding handles.



**Figure 3-17** Installing the Lockbar

7. Replace the lockbar.

- Open the cover on the front of the OCTANE workstation.
- Slide the lockbar into the lockbar slot.
- Insert the lock through the lockbar at the back of the workstation.

You have finished installing memory.

Go to Chapter 4 to begin your next task, installing the PCI board in the PCI module.

## Installing PCI Boards and the PCI Module

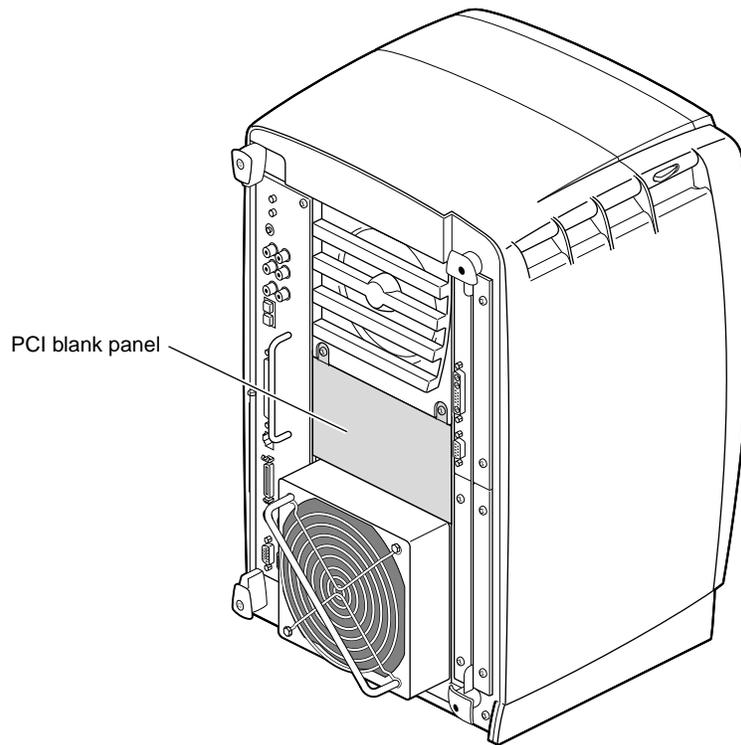
The PCI module is an optional module of the OCTANE workstation. To install PCI boards in the OCTANE workstation, place them in the PCI module and install the module in the OCTANE workstation.

This chapter contains information on installing PCI boards and the PCI module.

The following topics are covered in this chapter:

- “About the PCI Bus, Module, and Boards” on page 40.
- “Collecting the PCI Installation Materials” on page 42.
- “Inserting a PCI Board in a PCI Module” on page 43.
- “Identifying PCI Slots” on page 45.
- “Installing the PCI Module” on page 52.

For information on removing a PCI board, see Chapter 5.



**Figure 4-1** Identifying the Blank Panel

If your OCTANE workstation does not have a PCI module, a blank panel covers the opening for the PCI module.

### **About the PCI Bus, Module, and Boards**

Peripheral Component Interconnect (PCI) is a bus specification. The PCI bus is a high-performance local bus used to connect peripherals to memory and a microprocessor. A wide range of vendors make devices that plug into the PCI bus.

## PCI Board Size and Quantity

The PCI module supports full- or half-size boards. A maximum of three boards can be installed in the PCI module. The PCI module allows installation of PCI boards that have extra long I/O connectors. Possible board combinations are as follows:

- two full-size boards and one half-size board
- one full-size board and two half-size boards
- three half-size boards

## PCI Module Power Specification

Total power for the PCI module (the sum of power for all boards from all power supply rails) must not exceed 45.0 W (average 15.0 W per board).

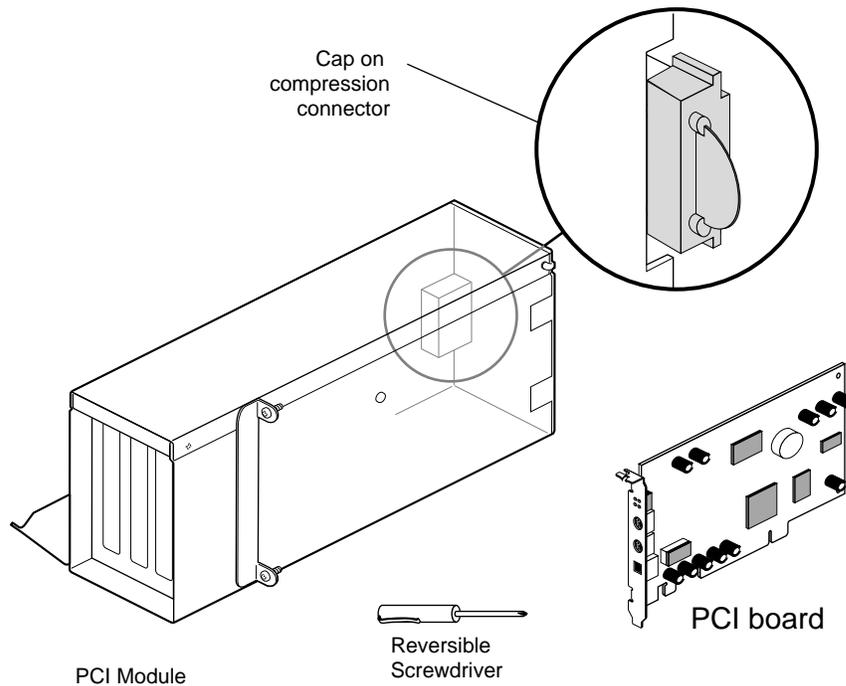
The OCTANE PCI module is a 5-volt system environment.

**Table 4-1** PCI Module Power Specifications

Power Supply Rail	Maximum Current	Maximum Power
3.3 V	10.0 amp	33.0 W
5.0 V	9.0 amp	45.0 W
12.0 V	1.5 amp	12.0 W
-12.0 V	0.3 amp	3.6 W

**Note:** For additional information, see Section 4.3.4.1 in the chapter “Power Requirements,” in the *PCI Local Bus Specification*, Rev. 2.1, June 1995 (PCI Special Interest Group, Portland, OR).

## Collecting the PCI Installation Materials

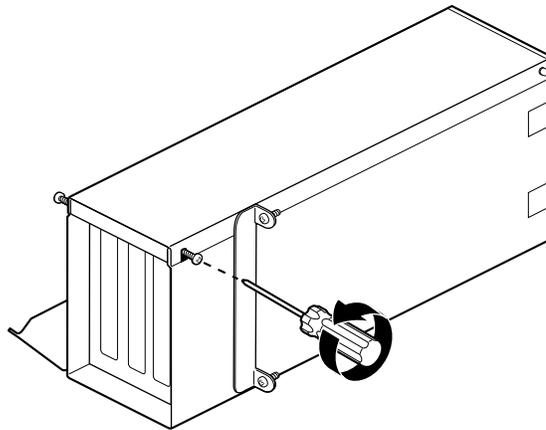


**Figure 4-2** Materials for the PCI Board Installation

1. For this portion of the Duo installation, gather together the following pieces of equipment:
  - the PCI module
  - the PCI board
  - the reversible screwdriver
2. Turn the module until you face the side with the compression connector cap.

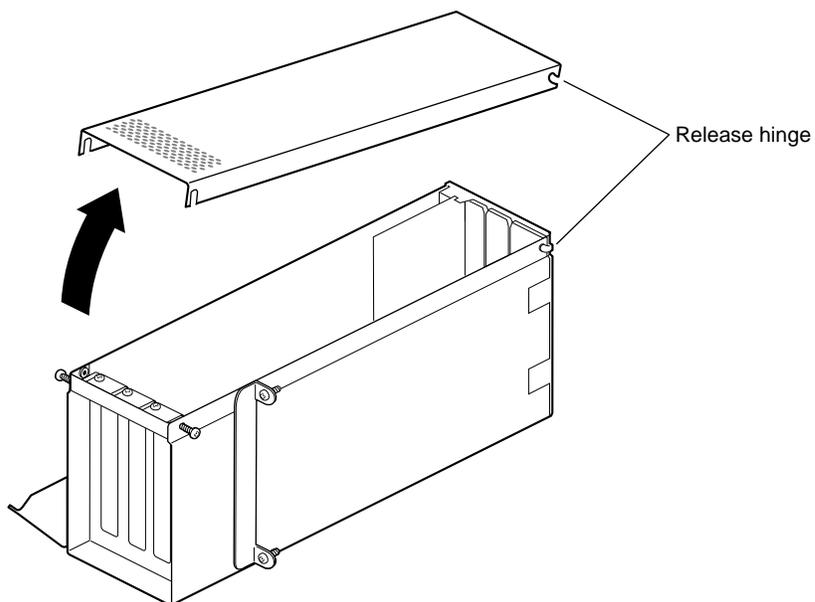
**Caution:** Leave the compression connector cap on until you are ready to install the PCI module in the OCTANE workstation. The compression connector beneath the cap is very easily damaged. Removing the cap now, and then placing PCI boards in the PCI module, will expose the compression connector to damage.

## Inserting a PCI Board in a PCI Module



**Figure 4-3** Loosening the Door Screws

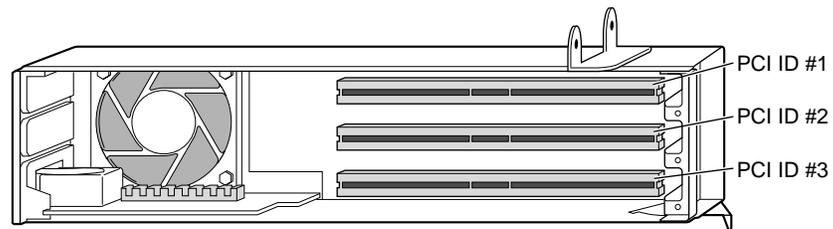
1. To begin installing the PCI board, turn the PCI module as shown in Figure 4-3.
2. Loosen the screws holding the PCI module door closed, but do not remove them.



**Figure 4-4** Opening the PCI Module Door

3. Pull up on the PCI module door. The release hinge allows the module door to rotate up and off.

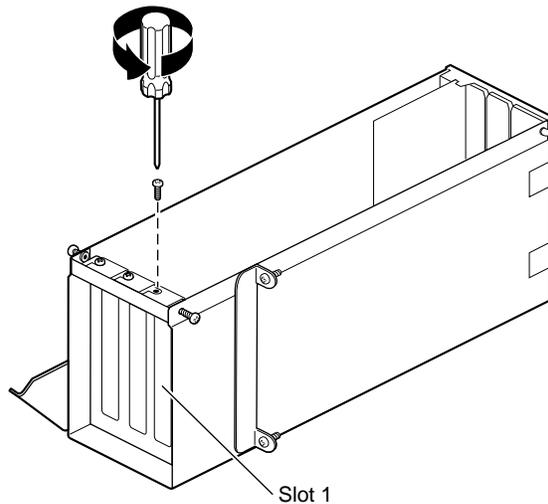
## Identifying PCI Slots



**Figure 4-5** Identifying a PCI Slot

PCI physical slots and slots identified in software have the same designation:

- The top slot is PCI ID #1.
- The middle slot is PCI ID #2.
- The bottom (half-sized) slot is PCI ID #3.

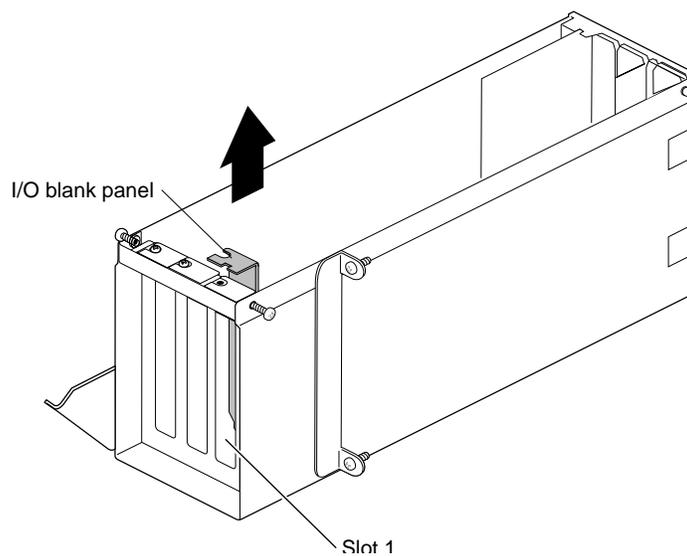


**Figure 4-6** Removing the I/O Blank Panel Screw

1. Remove the screw from the I/O blank panel in Slot 1, the slot to the far right when the module is open as in Figure 4-6.

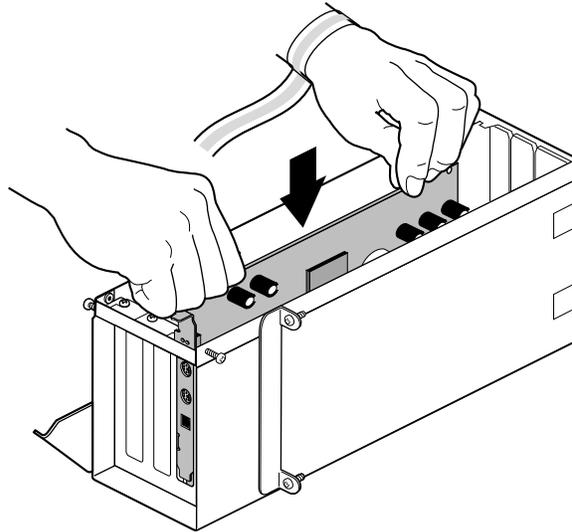
**Note:** Choose a slot in which you will permanently leave the PCI board. If you later choose to move this board to another slot, you may want to refer to Appendix D of this manual for configuration information.

For illustration purposes, the PCI board is shown in slot 1.



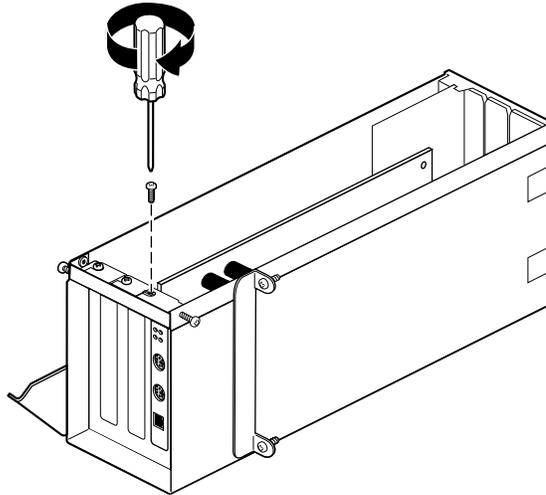
**Figure 4-7** Removing the I/O Blank Panel

2. Remove the I/O blank by pulling it up.
3. Keep the I/O blank panel. If you later remove a PCI board and do not replace it, you must reinstall the blank panel.



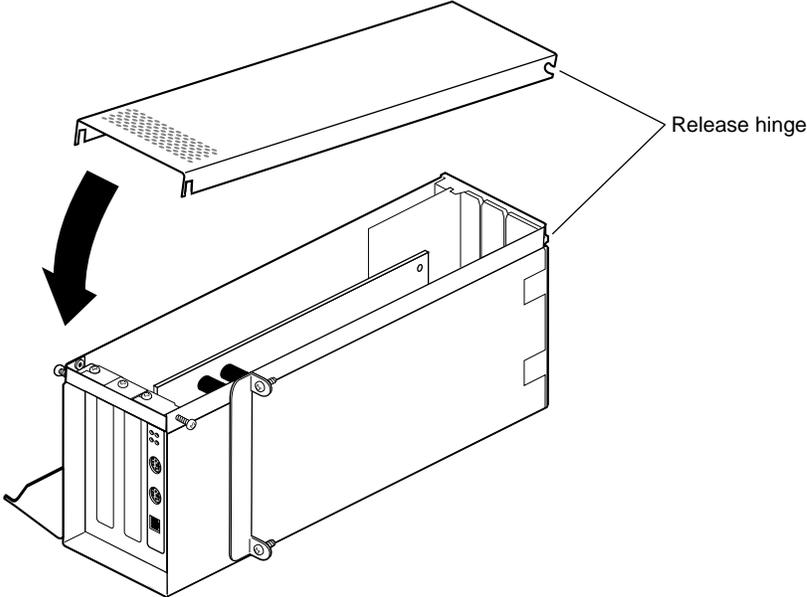
**Figure 4-8** Inserting a PCI Board Into the PCI Module

4. Insert the PCI board into a free slot in the PCI module. Push gently but firmly until the PCI board snaps into place.



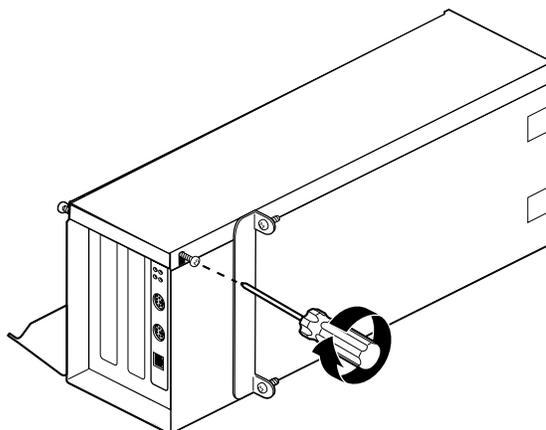
**Figure 4-9** Replacing the I/O Blank Panel Screw

5. Insert and tighten the screw that holds the PCI board to the I/O panel door.



**Figure 4-10** Reconnecting the PCI Module Door

- 6. Fit the hinged door to the PCI module.

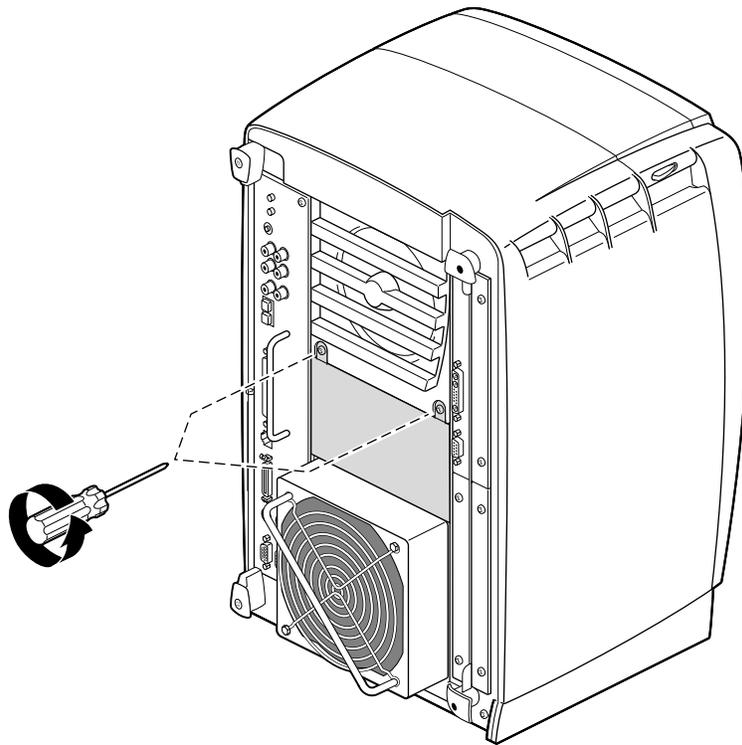


**Figure 4-11** Replacing the Door Screws

7. Tighten the PCI module door screws.

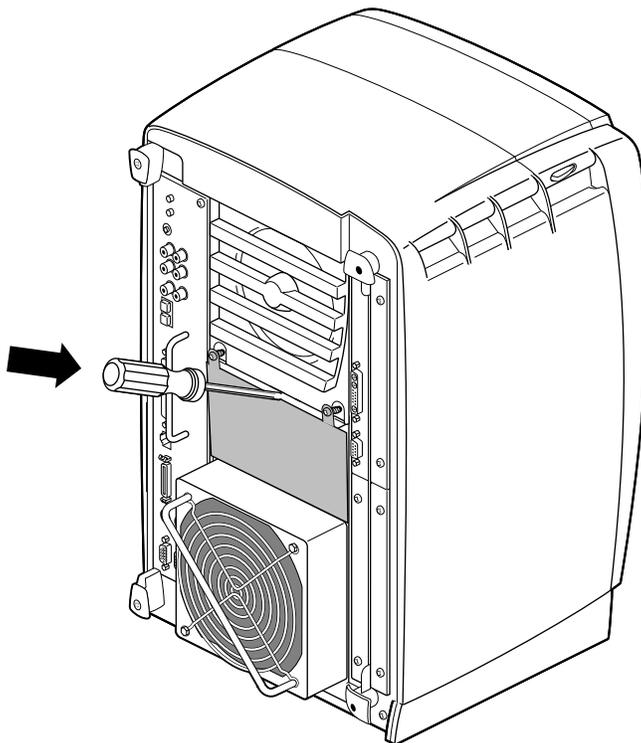
Go to “Installing the PCI Module” on page 52.

## Installing the PCI Module



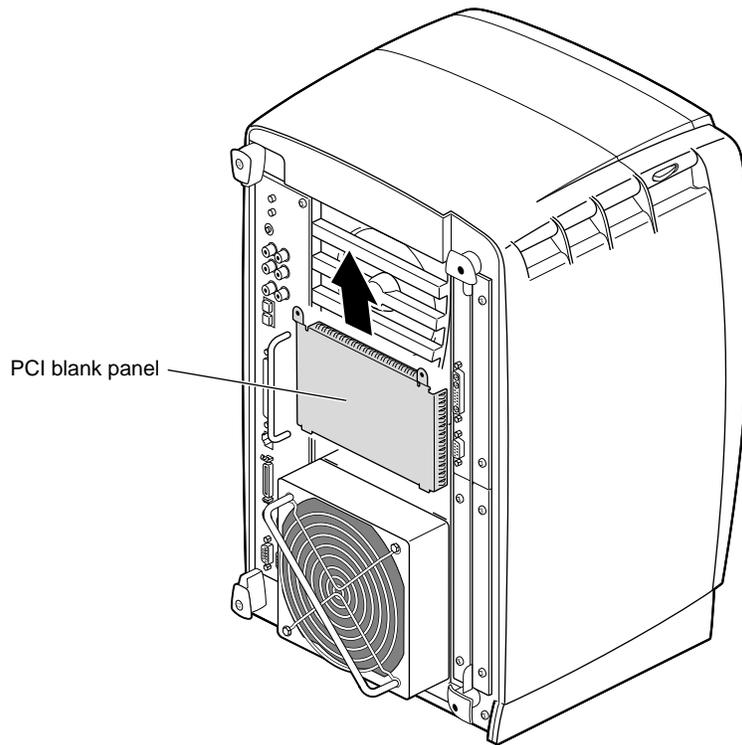
**Figure 4-12** Removing the Screws From the Blank Panel

1. Using a Phillips screwdriver, remove the screws from the blank panel.



**Figure 4-13** Loosening the Blank Panel

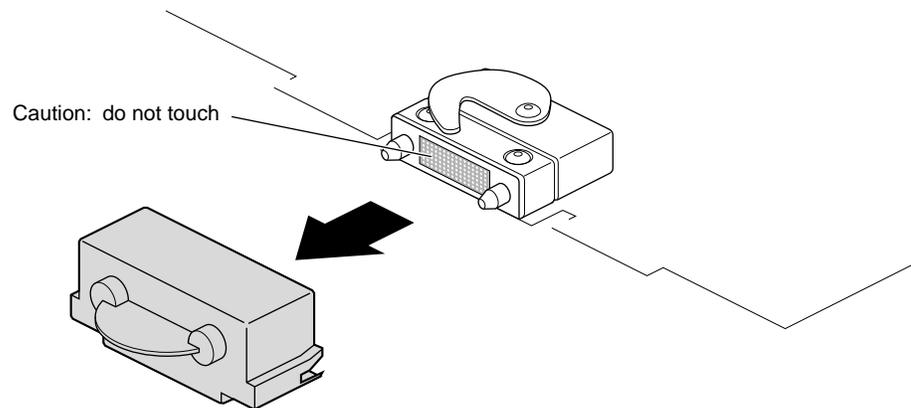
2. Using a flat-head screwdriver, place the tip of the screwdriver in the slot at the top and middle of the blank panel.
3. Use the screwdriver to pull outward on the blank panel until the screw tabs are far enough away from the chassis to grasp with your fingers.



**Figure 4-14** Removing the Blank Panel

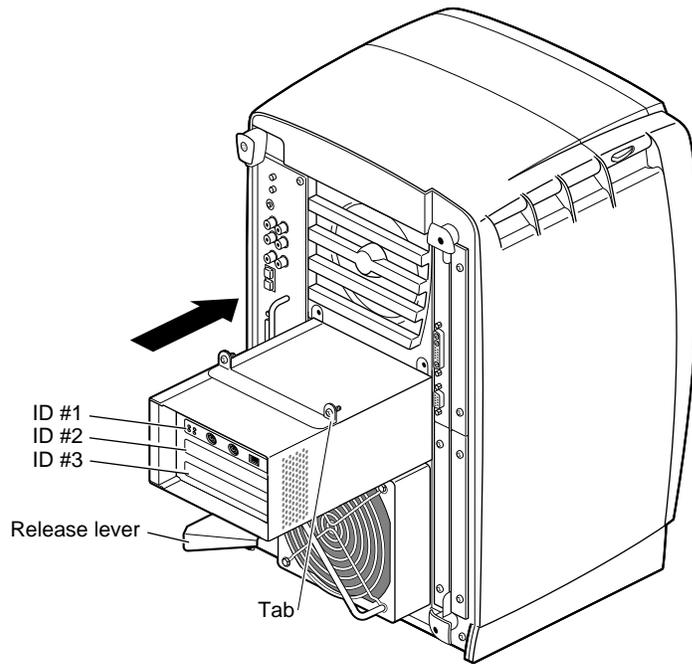
4. Pull the panel outward and lift it up and out.

Save the blank panel for reuse, should you ever need to remove the PCI module. Either the PCI module or the blank panel must be in place at all times.



**Figure 4-15** Removing the Cap From the Compression Connector

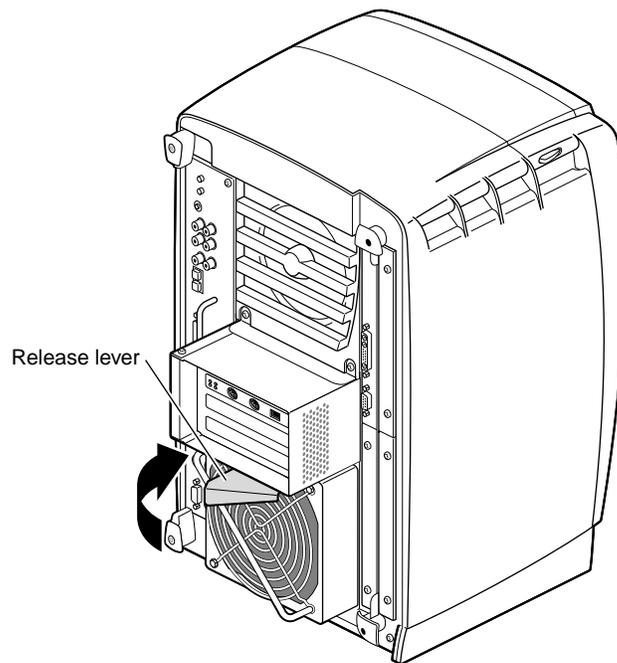
5. Remove the cap from the compression connector on the back of the PCI module, and save it for future use.



**Figure 4-16** Replacing the PCI Module

**Note:** If the release lever is not pulled out as shown in Figure 4-16, pull it out. It must be out for the PCI module to lock to the workstation.

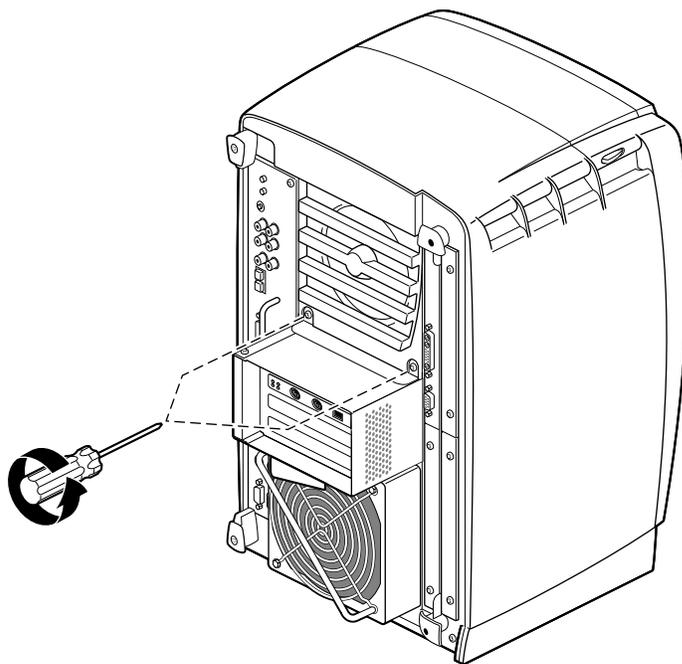
6. Place the PCI module in the chassis and push it in until the tabs are flush with the chassis.



**Figure 4-17** Closing the Release Lever

7. Close the release lever by pushing it to the left until it is parallel with the PCI module. You will feel some resistance as you close the lever.

**Note:** The release lever is on the bottom of the PCI module.



**Figure 4-18** Tightening the Captive Screws

8. Tighten the captive screws that hold the PCI module to the chassis.

**Note:** If you plan to use the networking capability of the PCI board, you must configure this port. See Appendix D for configuration information and resources after you have completed all the tasks for setting up the Duo system.

You have finished replacing the PCI module.

Skip to Chapter 6 to begin your next task, installing the second graphics board.

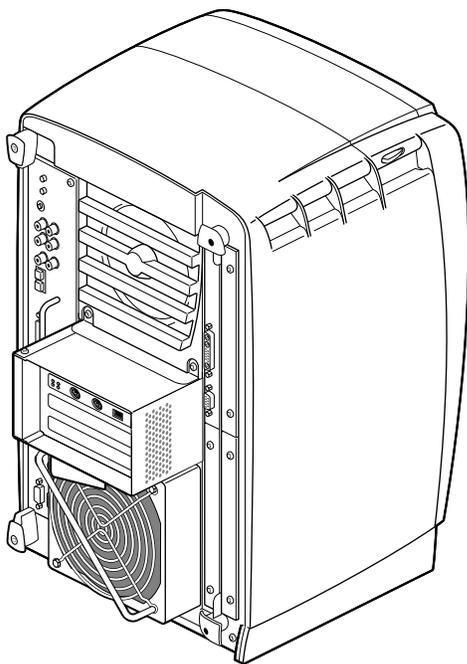
## Removing PCI Boards and the PCI Module

This chapter contains information on removing the PCI module and PCI boards.

The following topics are covered in this chapter:

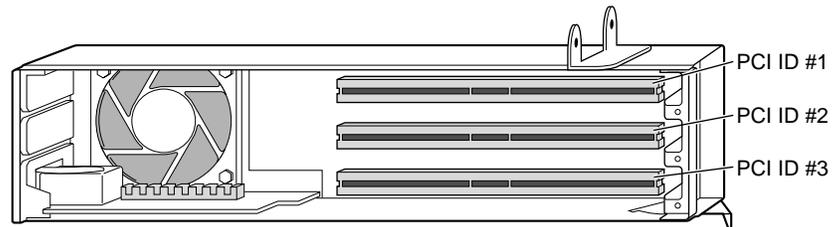
- “Identifying the PCI Module and PCI Slots” on page 60.
- “Powering Off the OCTANE Workstation” on page 61.
- “Attaching the Wrist Strap” on page 64.
- “Removing the PCI Module” on page 65.
- “Removing a PCI Board” on page 69.
- “Installing a Blank Panel” on page 74.
- “Installing the PCI Module” on page 77.
- “Powering on the Workstation” on page 81.

## Identifying the PCI Module and PCI Slots



**Figure 5-1** Identifying the PCI Module

The PCI slots are located inside the PCI module, which protrudes from the rear of your OCTANE workstation. You remove the PCI module to install or remove PCI boards. Follow the instructions in this chapter to power off the workstation and remove the PCI module and PCI boards.



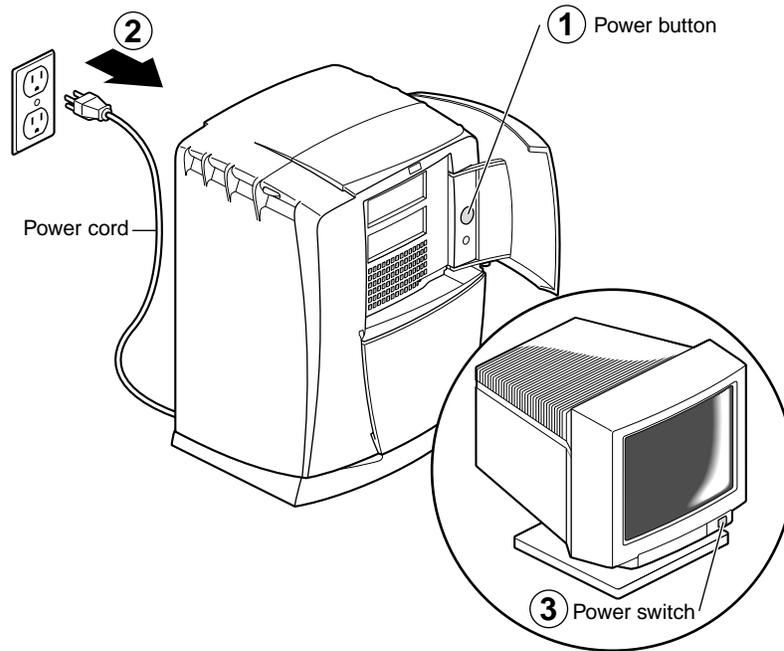
**Figure 5-2** Identifying a PCI Slot

PCI physical slots and slots identified in software have the same designation:

- The top slot is PCI ID #1.
- The middle slot is PCI ID #2.
- The bottom (half-sized) slot is PCI ID #3.

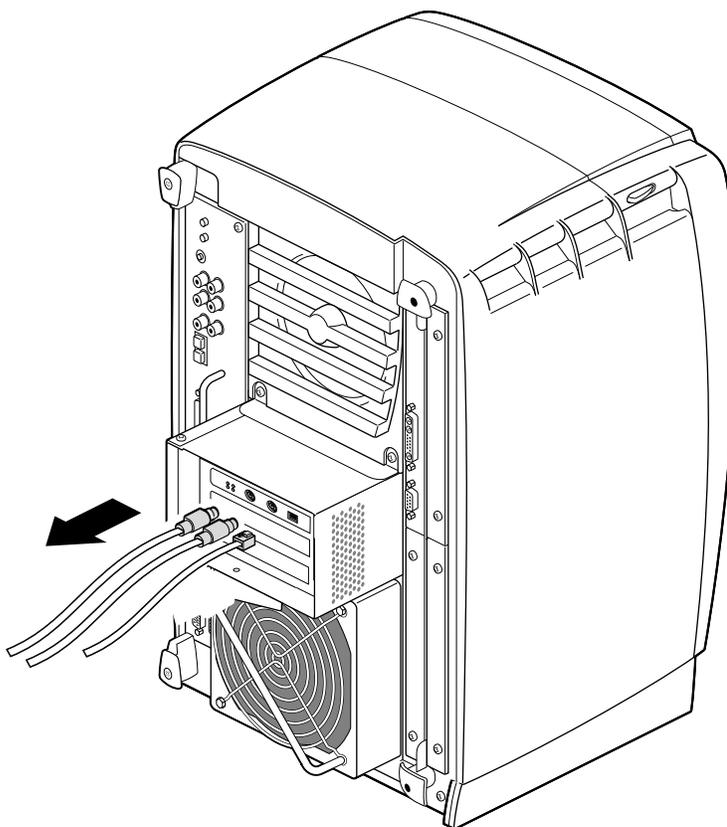
## Powering Off the OCTANE Workstation

Before you begin your task, power off the OCTANE workstation.



**Figure 5-3** Powering Off the OCTANE Workstation

1. Open the cover and push the power button to power off the OCTANE workstation.
2. Unplug the power cord from the electrical outlet.
3. Press the monitor power switch to turn off the monitor.
4. Face the rear of the workstation.

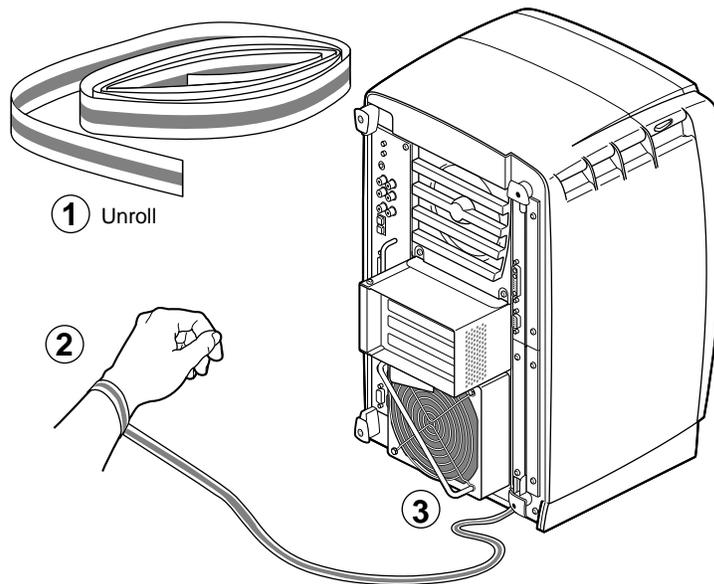


**Figure 5-4** Removing the Cables From the PCI Module

5. Remove any cables from the PCI module.

## Attaching the Wrist Strap

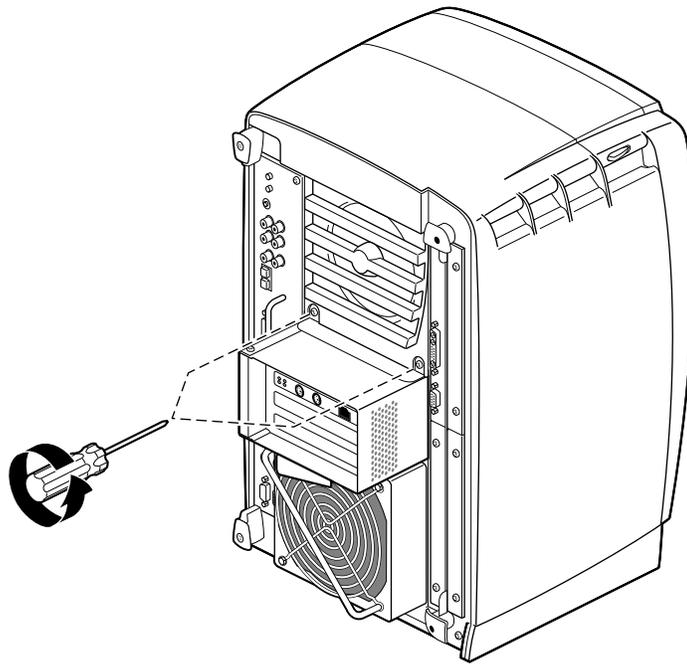
The components inside the OCTANE workstation are extremely sensitive to static electricity; you must wear the wrist strap while replacing parts.



**Figure 5-5** Attaching the Wrist Strap to the Chassis

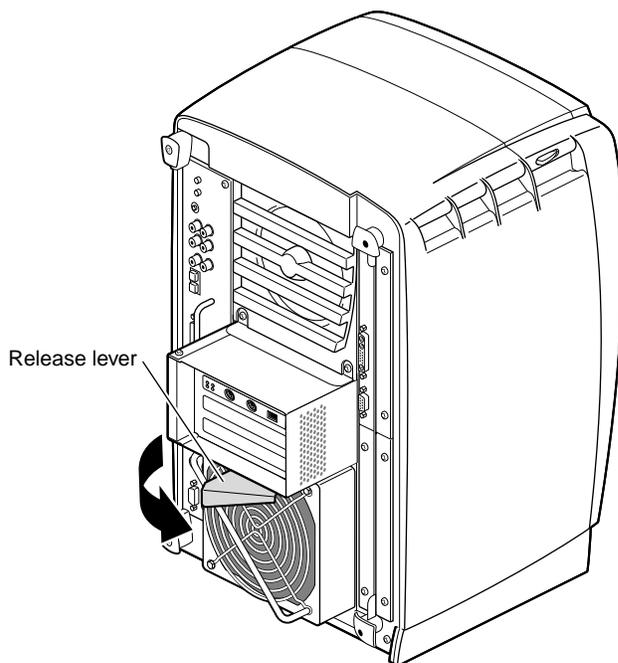
1. Unroll the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.
2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to the PCI module, or use any convenient and exposed electrical ground, such as a metal part of the OCTANE workstation.

## Removing the PCI Module



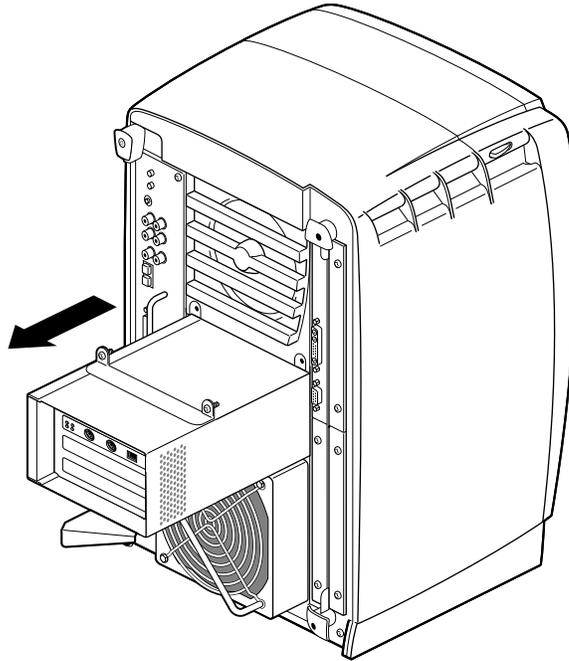
**Figure 5-6** Loosening the Captive Screws

1. Loosen the two captive screws that secure the PCI module to the OCTANE workstation until they are disconnected from the chassis.



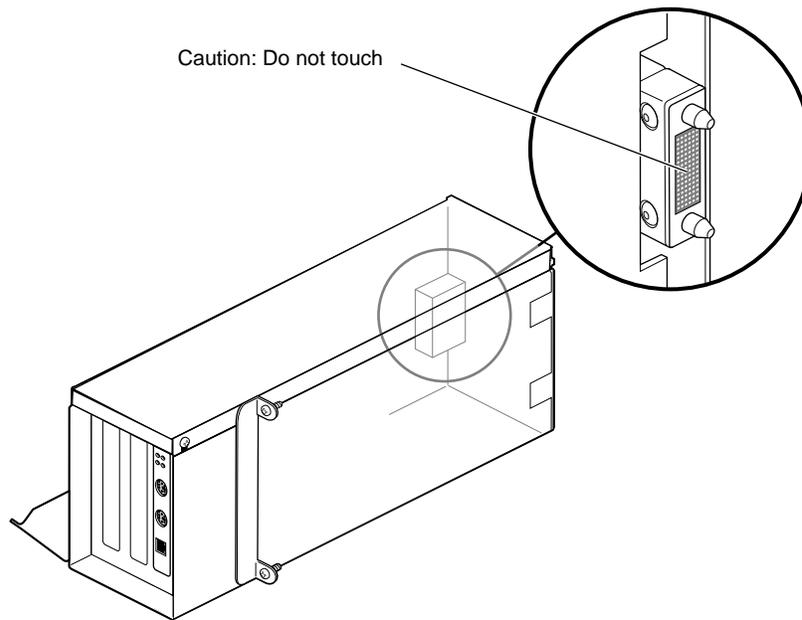
**Figure 5-7** Opening the Release Lever

2. Pull the release lever toward you and to the right. You will feel resistance as you open the lever. Continue to pull until the lever is at the angle shown in Figure 5-7. The lever releases the locking mechanism that attaches the PCI module to the workstation.



**Figure 5-8** Sliding the PCI Module From the Chassis

3. Slide the PCI module from the chassis. Place it on a dry, antistatic surface such as your desktop.

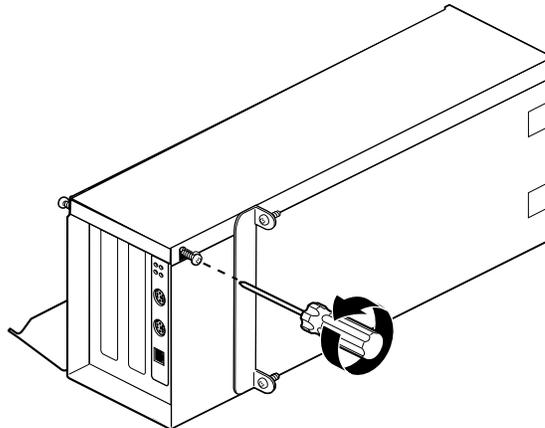


**Figure 5-9** Identifying the Compression Connector on the PCI Module

**Caution:** The compression connector on the back of the PCI module is delicate and easily damaged. Do not touch or bump the gold area of the compression connector.

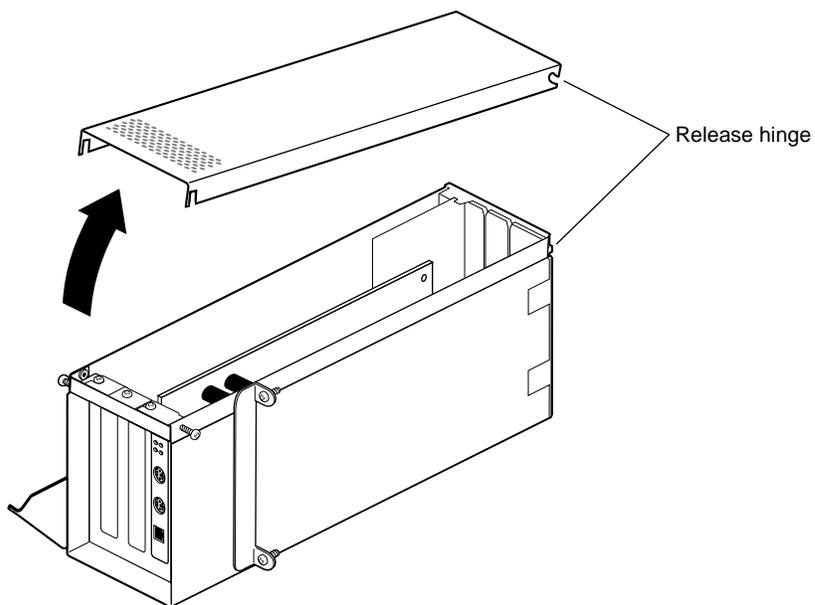
See Appendix B for information about and care of the compression connectors.

## Removing a PCI Board



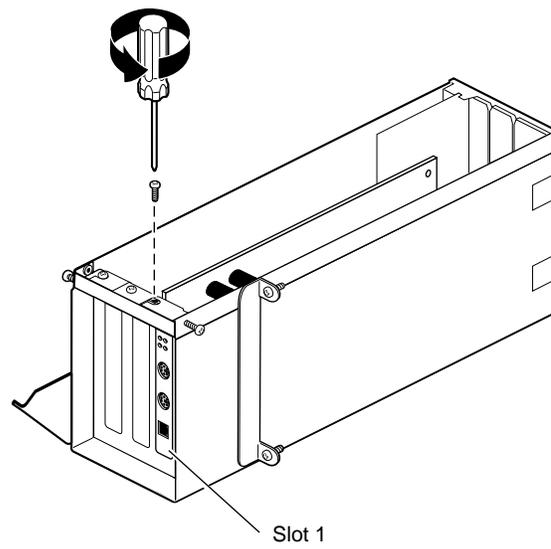
**Figure 5-10** Loosening the Door Screws

1. Turn the PCI module as shown in Figure 5-10.
2. Loosen the screws holding the PCI module door closed, but do not remove them.



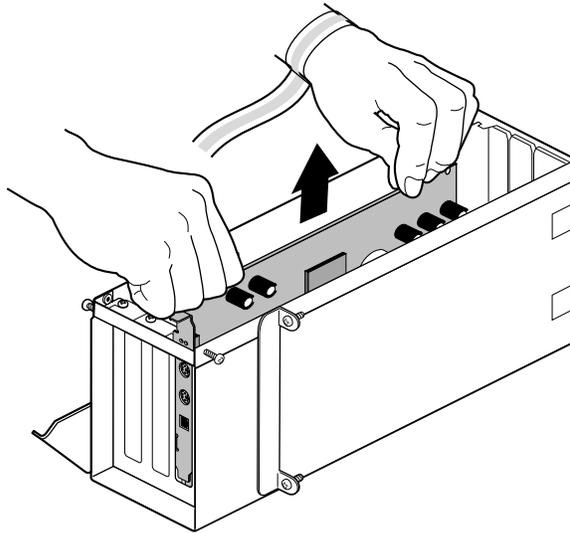
**Figure 5-11** Removing the Door

3. Pull up on the PCI module door. The release hinge allows the module door to slide up and off.



**Figure 5-12** Removing the Board Screw

4. Remove the screw holding the PCI board to the module.  
For illustration purposes, the PCI board is shown in slot 1.

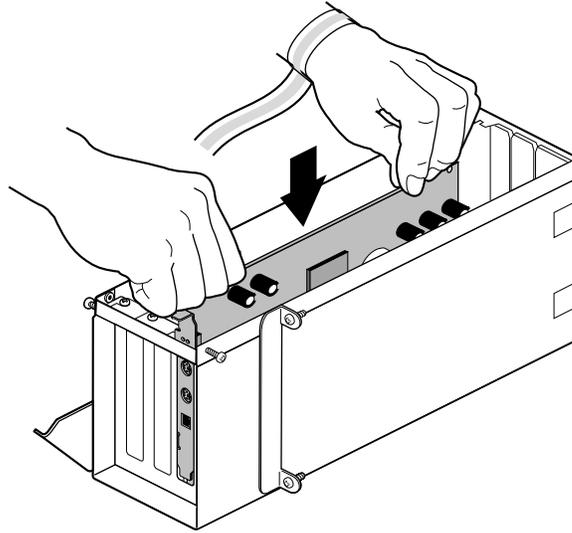


**Figure 5-13** Removing the Board

5. Grasp the PCI board on the top edge to extract it.
6. Pull up until the board releases. The board may be difficult to remove because it fits snugly into the connector in the PCI module

To install a PCI board, go to step 7.

To install a blank panel, go to "Installing a Blank Panel" on page 74.



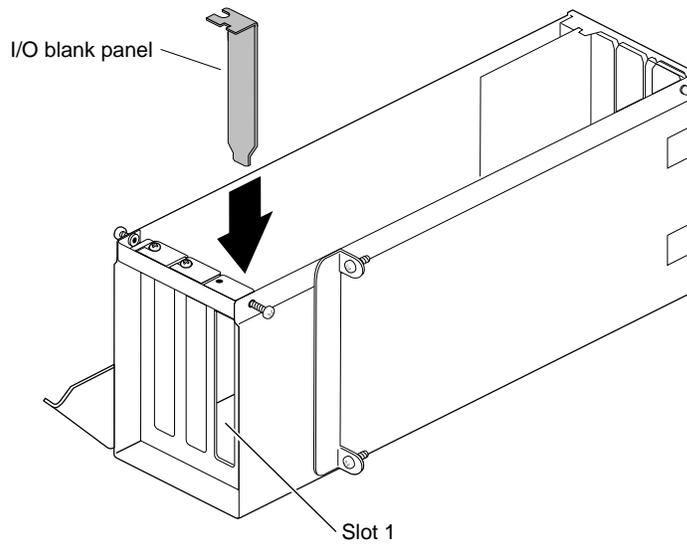
**Figure 5-14** Inserting a PCI Board Into the PCI Module

7. Insert the PCI board into the PCI module. Push gently but firmly until the PCI board snaps into place.

**Note:** Replace a new PCI Ethernet/keyboard/mouse board in the same slot from which you removed the old one. If you replace this board into a different slot, the system software remembers the first board, and thinks you have two similar boards installed. If you must place the board in a different slot, see Appendix D for instructions on deleting the *ioconfig.conf* file so that only one board is recognized.

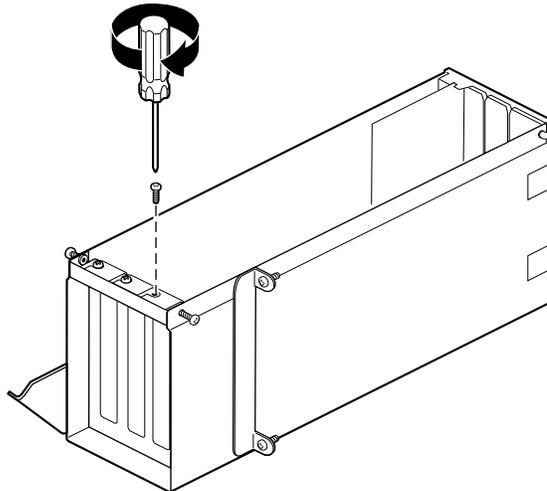
8. Skip to “Installing a Blank Panel,” step 2, on page 75.

## Installing a Blank Panel



**Figure 5-15** Inserting the I/O Blank Panel

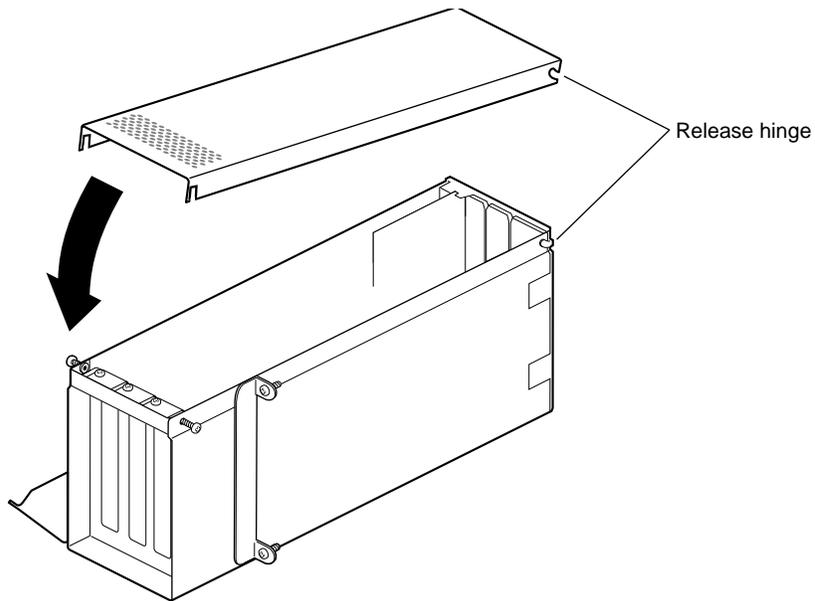
1. Install an I/O blank panel in the I/O door in place of the PCI board.  
Be sure to place the tip of the I/O blank panel inside the groove at the bottom of the PCI module. Do not position the tip outside the groove.



**Figure 5-16** Attaching the I/O or Board Screw

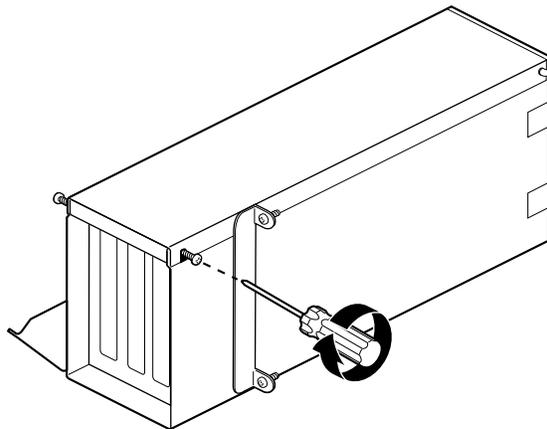
2. Attach the blank panel (or new PCI board) to the I/O door with a screw. Replace and tighten any other screws that hold boards to the I/O door.

For illustration purposes, a blank panel, rather than a PCI board, is shown in the remaining steps of this chapter.



**Figure 5-17** Replacing the Door

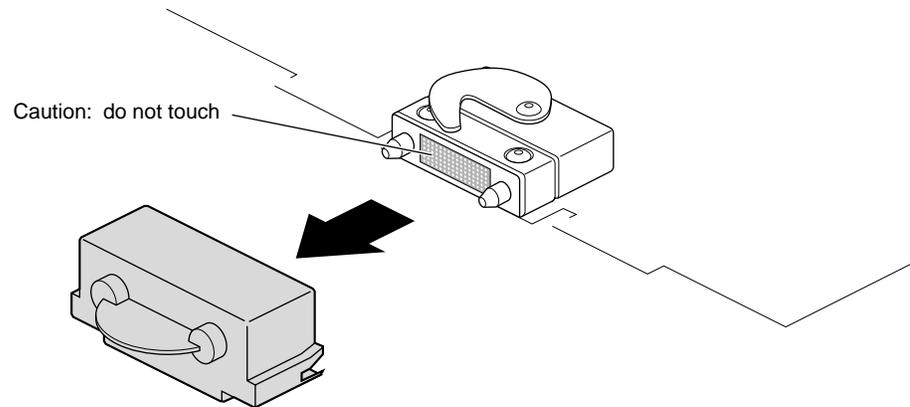
3. Fit the hinged door to the PCI module.



**Figure 5-18** Tightening the Door Screws

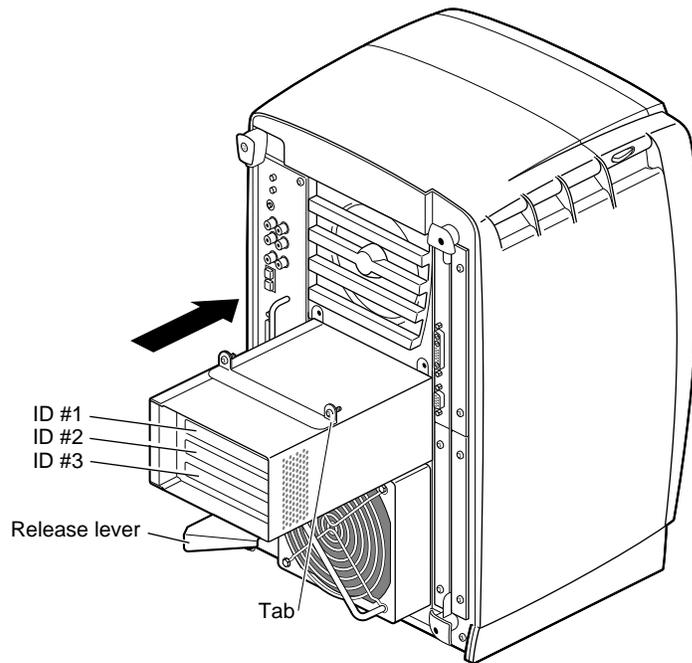
4. Tighten the door screws.

## Installing the PCI Module



**Figure 5-19** Removing the Cap From the Compression Connector

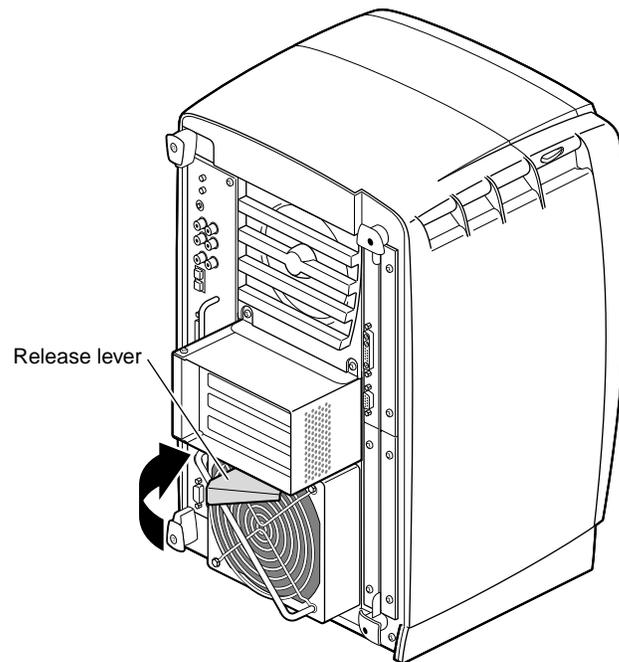
1. Remove the cap from the compression connector on the back of the PCI module, and save it for future use.



**Figure 5-20** Replacing the PCI Module

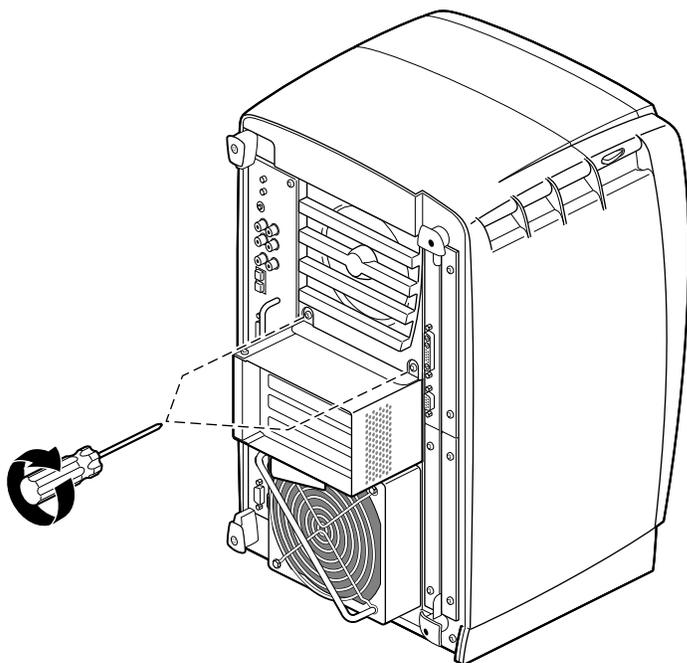
**Note:** If the release lever is not pulled out as shown in Figure 5-20, pull it out. It must be out for the PCI module to lock to the workstation. The release lever is attached to the bottom of the PCI module.

2. Place the PCI module in the chassis and push it in until the tabs are flush with the chassis.



**Figure 5-21** Closing the Release Lever

3. Close the release lever by pushing it to the left until it is parallel with the PCI module. You will feel some resistance as you close the lever.



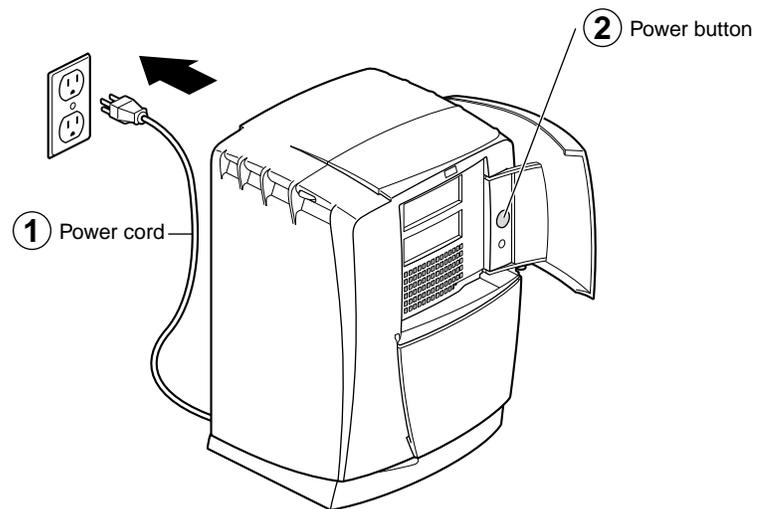
**Figure 5-22** Tightening the Captive Screws

4. Tighten the captive screws that hold the PCI module to the chassis.

**Note:** If you plan to use the networking capability of the PCI board, you must configure this port. See Appendix D for configuration information and resources after you have completed all the tasks for setting up the Duo system.

You have finished replacing the PCI module and are ready to power on the workstation.

## Powering on the Workstation



**Figure 5-23** Powering On the OCTANE Workstation

1. Plug the OCTANE power cord into an electrical outlet.
2. Push the power button on the front of the OCTANE workstation.

You are finished powering on the workstation.



## Installing and Removing an OCTANE/SI or /SE Graphics Board

This chapter tells you how to install the OCTANE/SI or /SE graphics board in the OCTANE workstation.

The existing graphics board is the primary head. The OCTANE/SI or /SE board that you install becomes the secondary head in a Duo configuration.

This chapter provides the following information and instructions:

- “About the Duo Configuration” on page 84.
- “Removing the XIO Module” on page 86.
- “About the XIO Module and Graphics Boards” on page 92.
- “Removing the Blank Panel” on page 93.
- “Attaching the Secondary OCTANE/SI or /SE Graphics Board to the XIO Module” on page 96.
- “Removing the Secondary OCTANE/SI or /SE Graphics Board” on page 97.
- “Anticipating a Problem Area” on page 101.
- “Replacing the XIO Module” on page 102.

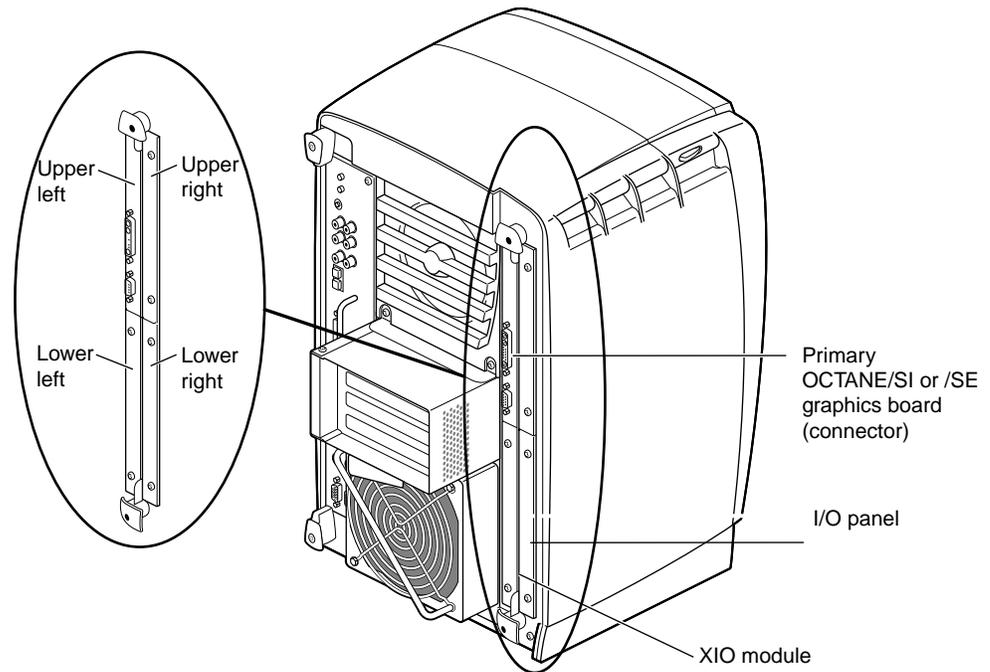
## About the Duo Configuration

Dual graphics boards in the OCTANE workstation are designated primary and secondary heads.

- The primary head is the graphics board pre-installed in the workstation (slot A or slot A and covering slot D). It carries any texture memory option board.
- The secondary head is the option board, which is installed in slot B or possibly C. It may carry a texture memory option board if both graphics boards are OCTANE/SI or /SE. See Table 6-1 for supported configurations with the texture memory option board.

**Table 6-1** Supported Graphics Board Configurations

Primary Graphics Board	Secondary Graphics Board
OCTANE/SI or /SE (slot A)	OCTANE/SI or /SE
OCTANE/SI or /SE with texture memory board (slot A)	OCTANE/SI or /SE
OCTANE/SI or /SE with texture memory board (slot A)	OCTANE/SI or /SE with texture memory board
OCTANE/SSI or /SSE (slots D and A)	OCTANE/SI or /SE
OCTANE/MXI or /MXE (slots D and A)	OCTANE/SI or /SE



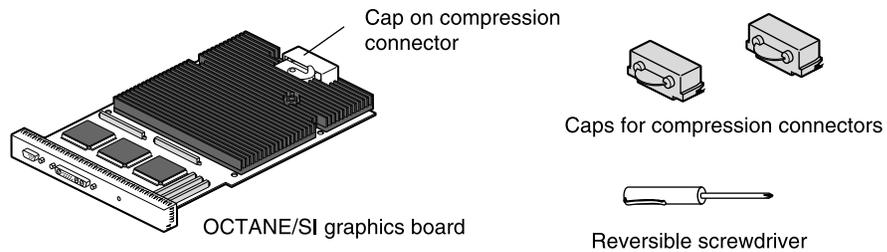
**Figure 6-1** Locating the XIO Module and Graphics Boards

All graphics boards reside on the XIO module. Access to this module is from the back of the OCTANE workstation.

The XIO module is the holding mechanism for XIO graphics or XIO option boards and holds up to four boards. It can be thought of as a tray to which boards are attached.

Follow the directions in this chapter to install the OCTANE/SI or /SE graphics board, beginning with "Collecting the Graphics Board Installation Materials" on page 86.

## Collecting the Graphics Board Installation Materials

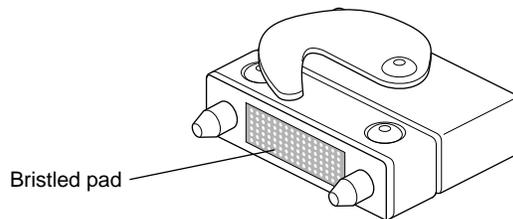


**Figure 6-2** Materials for Installing the Secondary OCTANE/SI or /SE Graphics Board

Gather these parts to install the secondary OCTANE/SI or /SE graphics board:

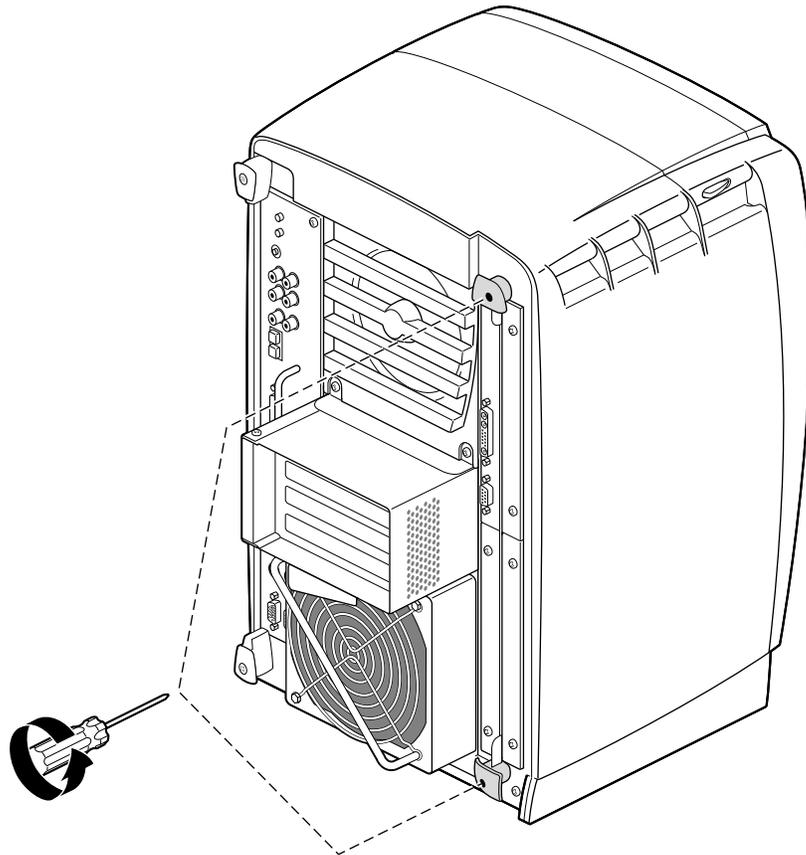
- The secondary OCTANE/SI or /SE graphics board.
- The reversible screwdriver.
- Caps for the primary graphics board and any option board attached to the XIO module. You place these caps on the compression connectors on the board to prevent damage when the XIO module is out of the workstation.

## Removing the XIO Module



**Figure 6-3** Identifying the Compression Connector

**Caution:** Before you remove the XIO module, be aware that compression connectors are on graphics and option boards. The connectors are on the side opposite the handle. Do not grab the back of the XIO module when you remove it, or the compression connectors may be damaged.

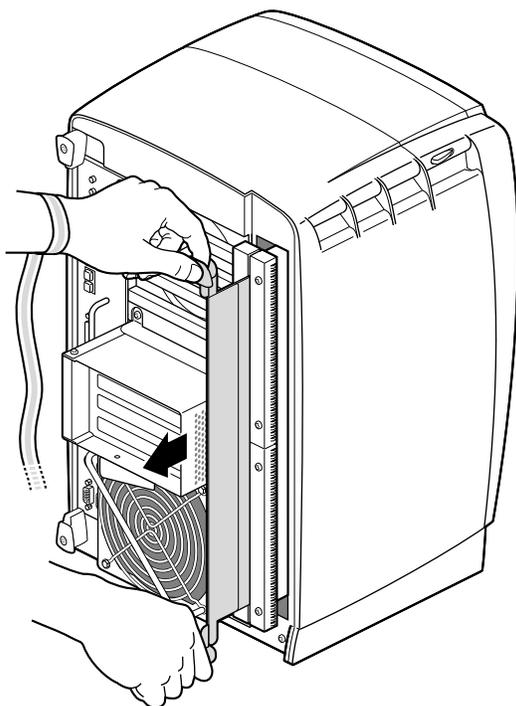


**Figure 6-4** Removing the XIO Module Screws



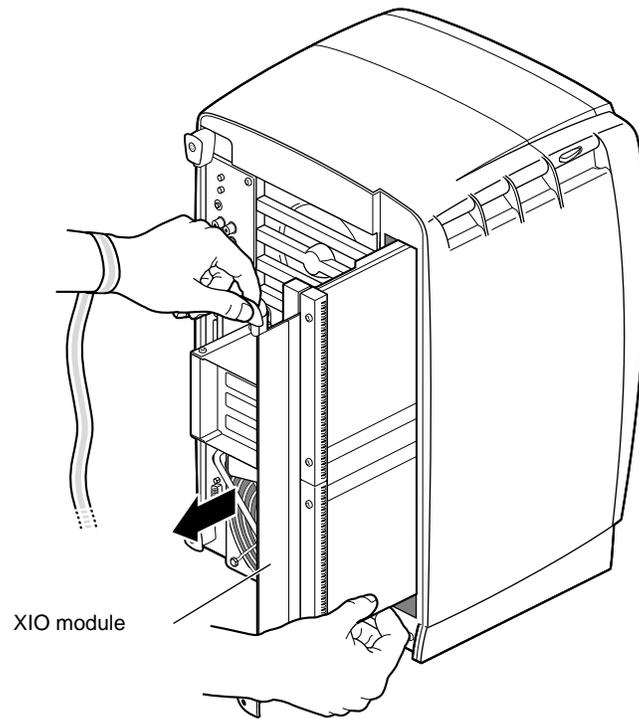
**Warning:** The heat sinks on the XIO boards become very hot. Wait five minutes after powering off the OCTANE workstation before you remove the XIO module. Test before touching any of the XIO boards.

1. Loosen the two captive screws in the XIO module handles with the supplied Phillips screwdriver until the screws are disconnected from the chassis.



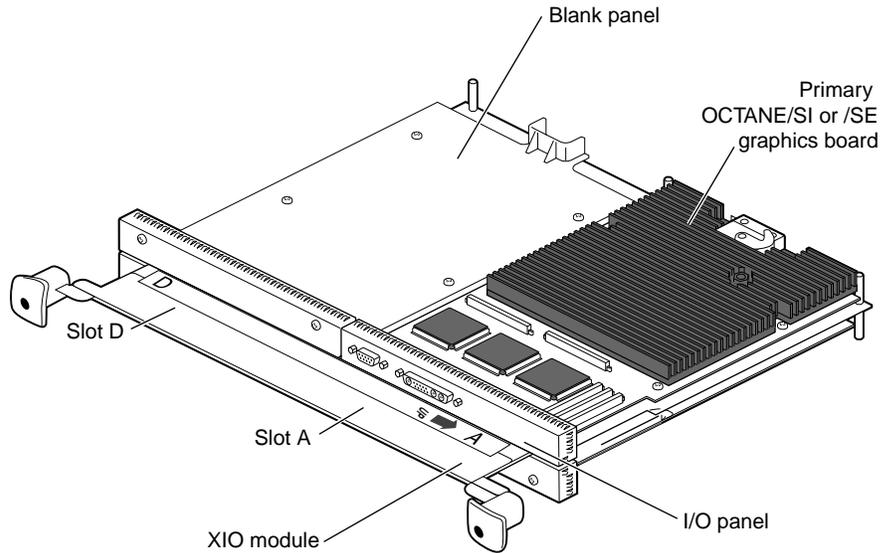
**Figure 6-5** Releasing the XIO Module

2. Grasp the handles and pull until the XIO module protrudes about an inch from the chassis.  
The handles and XIO module move out about one inch before the I/O panels move.
3. Pull gently on the handles until the XIO module is about three or four inches out of the workstation.



**Figure 6-6** Removing the XIO Module

4. Grasp the XIO module along its length, and support the base of the module as you remove it from the chassis.

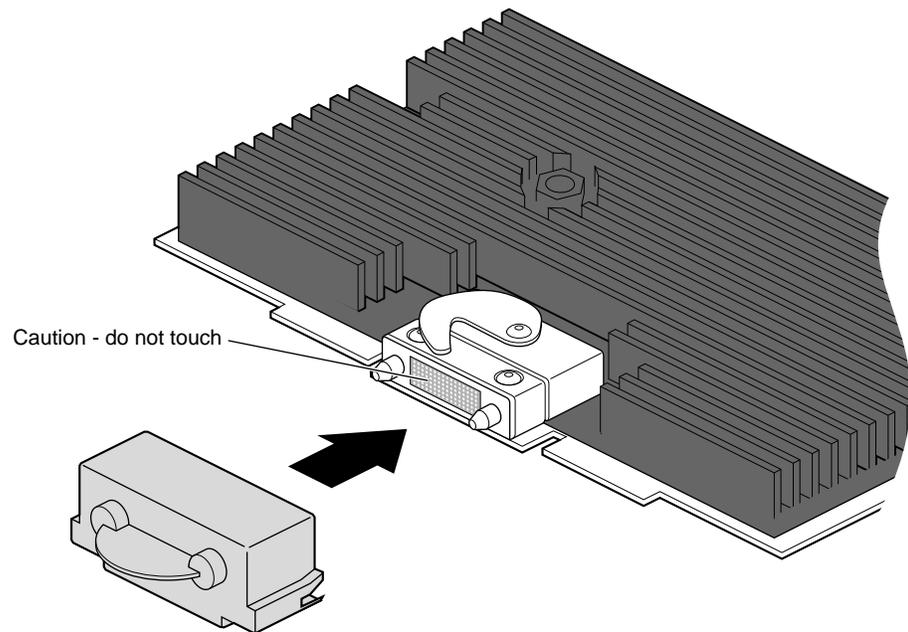


**Figure 6-7** Placing the XIO Module on its Side

The handle area protrudes when the XIO module is out of the chassis. When the handle protrudes, the identification label for slots D and A is visible; slots B and C are on the reverse side. See Figure 6-7.

**Note:** Do not push on the handle area after you have removed the XIO module. The XIO module locks to the workstation only if the handle area is protruding.

5. Place the XIO module on a flat, antistatic surface. An empty antistatic bag on your desk works well.



**Figure 6-8** Placing a Cap on the Compression Connector

6. Place a cap on the XIO graphics board compression connector. Spare caps are located on the blank panels. See Figure 6-8.

**Caution:** Do not touch or bump the gold (front) surface of the compression connector. Touching it could damage the connector. Place a protective cap on the compression connector to prevent damage when the XIO boards are removed from the OCTANE workstation. See Appendix B, "Care and Cleaning of the Compression Connectors."

## About the XIO Module and Graphics Boards

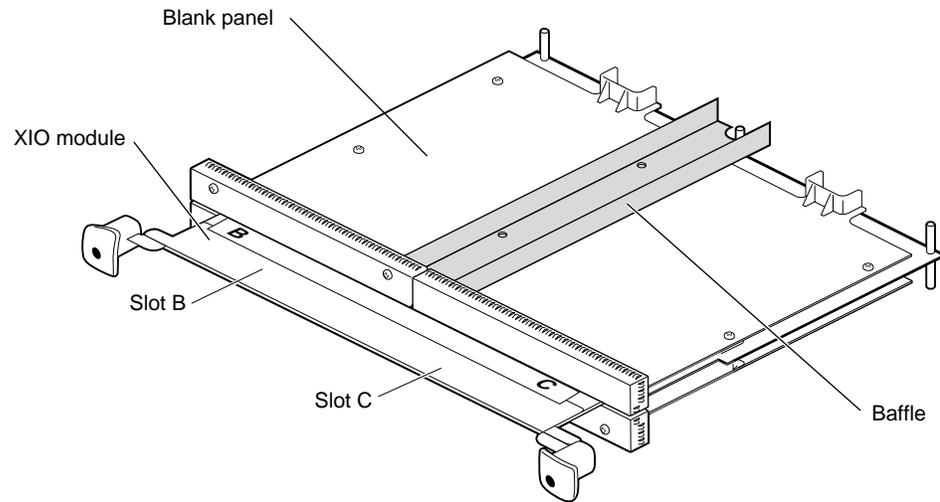
The XIO module is the holding mechanism for XIO graphics or XIO option boards and holds up to four boards. It can be thought of as a tray to which boards are attached.

The four quadrants of the XIO module are Slots A, B, C, and D. Slots D and A are on one side, slots B and C on the other.

A graphics board, option board, or blank panel attaches to each slot on the XIO module. The only exception is the OCTANE/SSI or /SSE or OCTANE/MXI or /MXE graphics boards, which occupy two slots, A and D.

- The graphics boards must be placed at the top left and right, as you insert the XIO module, or they may overheat and be damaged.
- The primary head graphics board must be in slot A (OCTANE/SI or /SE) or slots A and D (OCTANE/SSI or /SSE, or OCTANE/MXI or /MXE). The secondary head (OCTANE/SI or /SE board) occupies slot B, or possibly slot C.
- The primary graphics board carries the texture memory option board with one exception. Only in the following configuration can the secondary head carry the texture memory option board: OCTANE/SI or /SE with texture memory option board (as the primary head), OCTANE/SI or /SE with texture memory option board (as the secondary head).
- The secondary OCTANE/SI or /SE graphics board occupies slot B, unless it is occupied by an option board with flex cables to the graphics board. Then the secondary OCTANE/SI or /SE graphics board occupies slot C. (Exception: Do not install a secondary OCTANE/SI or /SE graphics board with the Digital Video option board.)
- Graphics and option boards may be linked by flex cables.
- Protective blank panels must be placed in unused slots.
- Extra caps for the compression connectors come with the workstation.
- If you lose a screw that holds the graphics board, single-layer option boards, or blank panels to the XIO module, use M3 x 8 mm size screws. (See your option board manual for the screw size for attaching option boards with daughterboards.)

## Removing the Blank Panel



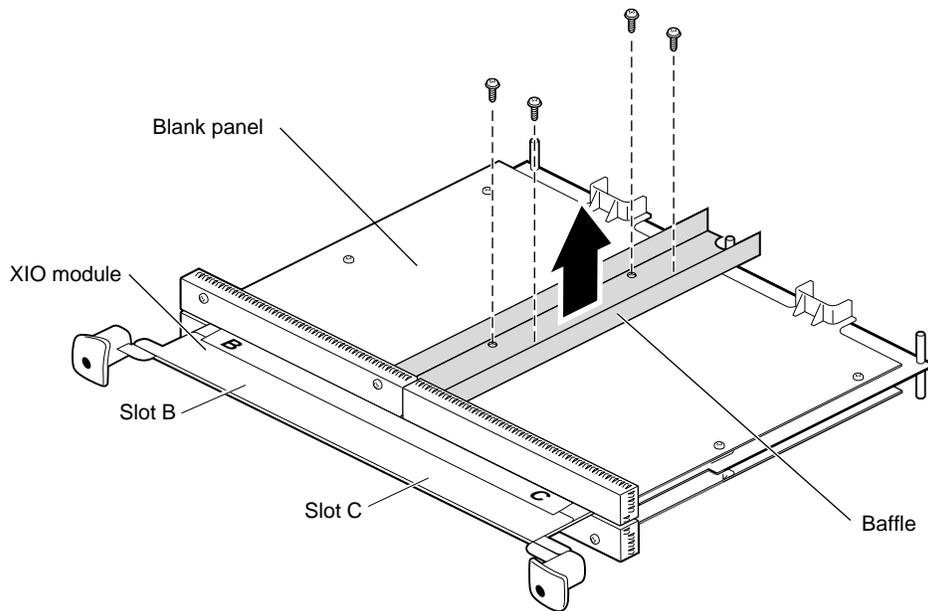
**Figure 6-9** Identifying the Baffle and Blank Panel

If you are installing the texture memory option board on the secondary OCTANE/SI or /SE graphics board (only in an OCTANE/SI or /SE workstation with texture memory OCTANE/SI or /SE with texture memory configuration), do so before installing the secondary head on the XIO module. See the *OCTANE Texture Memory Option Board Installation Guide* for instructions. Be sure you fully seat this board.

Install the secondary OCTANE/SI or /SE graphics board in slot B. If it is occupied by an option board with flex cables to the graphics board, install the secondary OCTANE/SI or /SE graphics board in slot C.

**Caution:** If the Digital Video option board is in slot B, remove it before installing the secondary OCTANE/SI or /SE graphics board in slot B. The Duo upgrade and the Digital Video option in the same system are not a supported configuration. See the *OCTANE Digital Video Option Board and OCTANE Compression Installation Guide* for instructions on removing this option board.

Before you install the secondary OCTANE/SI or /SE graphics board, you need to remove a protective blank panel or option board from any available slot. The processes for removing a blank panel or option board are the same. If you are removing an option board (from slot B), refer to the board's installation guide for instructions on removing it.



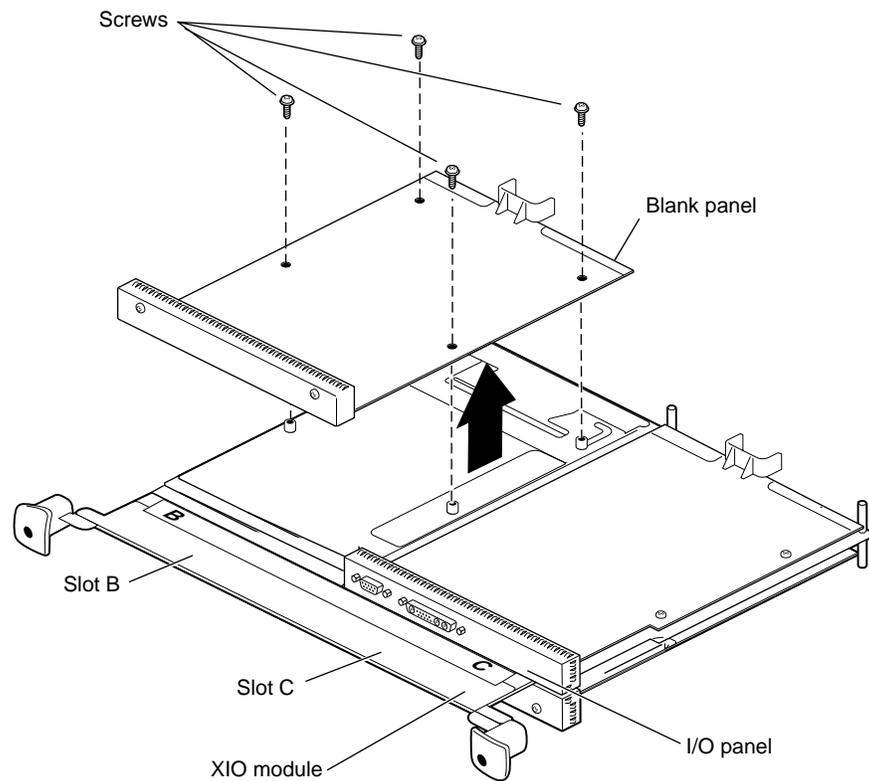
**Figure 6-10** Removing the Baffle

If you are removing a blank panel that is next to an option or graphics board, skip to step 8. If you are removing a blank panel that is side by side with another blank panel, go to the next step.

Remove the baffle attached to two blank panels.

1. Remove the four screws holding the baffle to the blank panels, and remove the baffle. The baffle is used only when two blank panels are side by side on the XIO module. (Keep it and use it if you ever place two blank panels side by side on the XIO module.)
2. Remove the remaining screws from the blank panel you are removing.

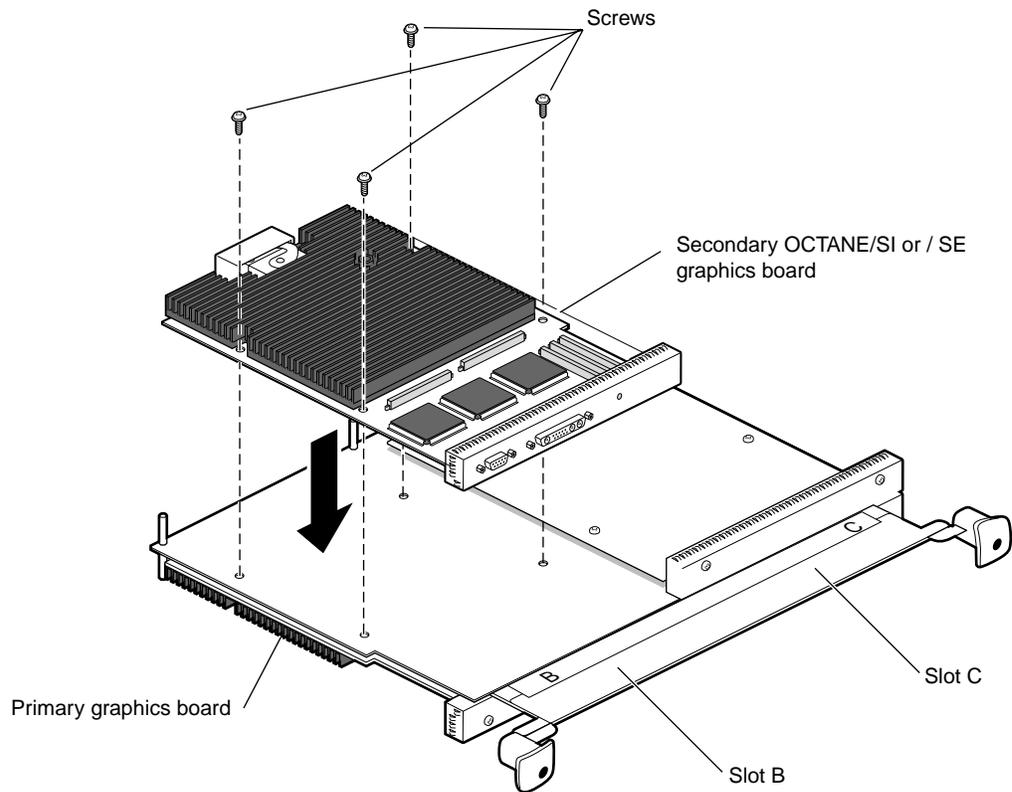
3. Replace two screws in the blank panel that you are not removing.
4. Skip to “Attaching the Secondary OCTANE/SI or /SE Graphics Board to the XIO Module” on page 96.



**Figure 6-11** Removing the Blank Panel

5. Using a Phillips screwdriver, remove the screws from the blank panel or option board.
6. Grasp the blank panel or option board by the I/O panel and the opposite side of the board and lift. It is a good idea to save the blank panel to reinstall in the workstation should you need to remove an option board.
7. With the same side facing up, place the board on a clean, antistatic surface.
8. Go to the next section to install the secondary OCTANE/SI or /SE graphics board.

## Attaching the Secondary OCTANE/SI or /SE Graphics Board to the XIO Module



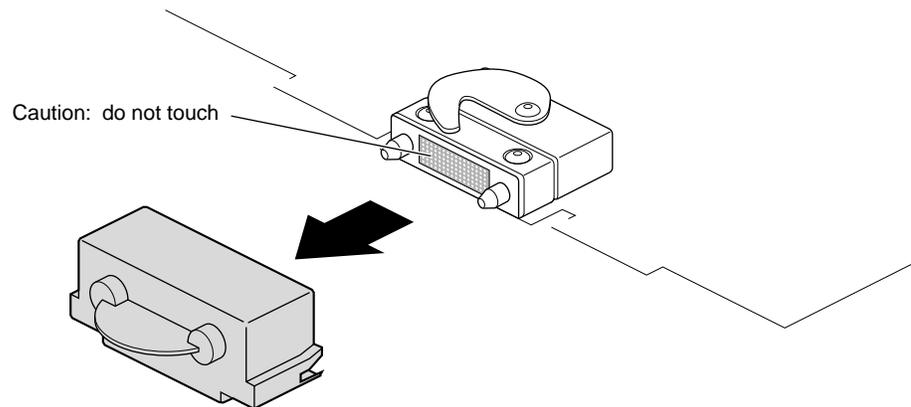
**Figure 6-12** Attaching the Secondary OCTANE/SI or /SE Graphics Board

1. Place the secondary OCTANE/SI or /SE graphics board in slot B (or slot C if B is occupied with an option board with flex cables to the graphics board.)

**Caution:** Do not remove the cap on the XIO compression connector until your installation process is complete.

2. Replace the screws, tightening the board to the standoffs.

**Note:** Be sure all the slots are filled with a graphics board, option boards, or blank panels. The system will not cool properly if any of the slots are empty. (Do not install the baffle except on side-by-side blank panels.)



**Figure 6-13** Removing the Cap From the Compression Connector

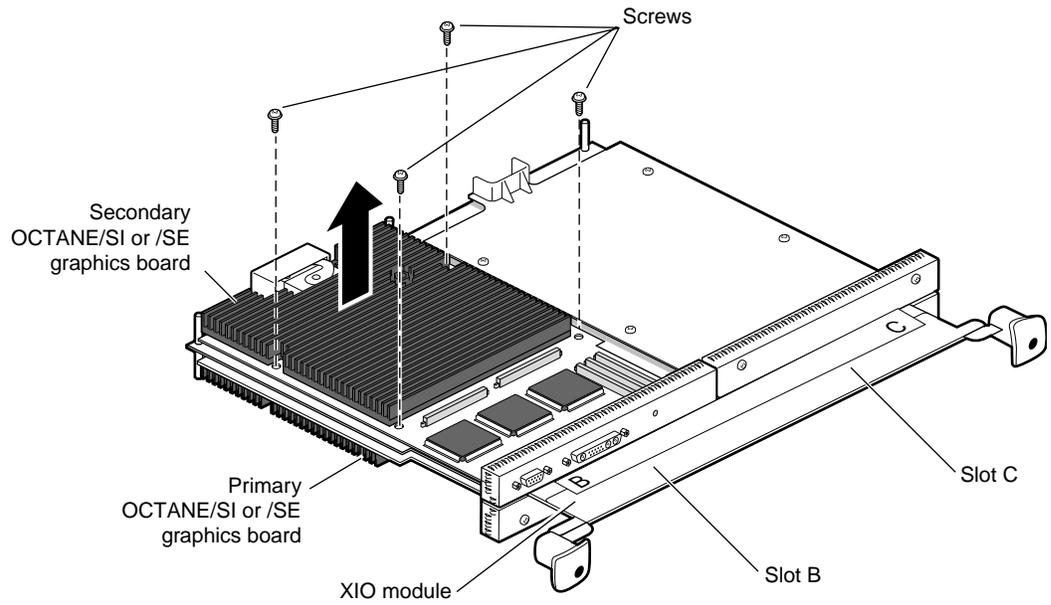
3. Remove the caps from the compression connectors.
4. Keep the caps from the compression connectors to place them on the XIO boards, the system module, or PCI module whenever you have any part with a compression connector removed from the OCTANE workstation.
5. Go to “Replacing the XIO Module” on page 102.

## Removing the Secondary OCTANE/SI or /SE Graphics Board

Before you remove the secondary OCTANE/SI or /SE graphics board, gather together the new graphics board or blank panel, a Phillips screwdriver, a wrist strap, and compression connector caps for the graphics and option boards attached to the XIO module.

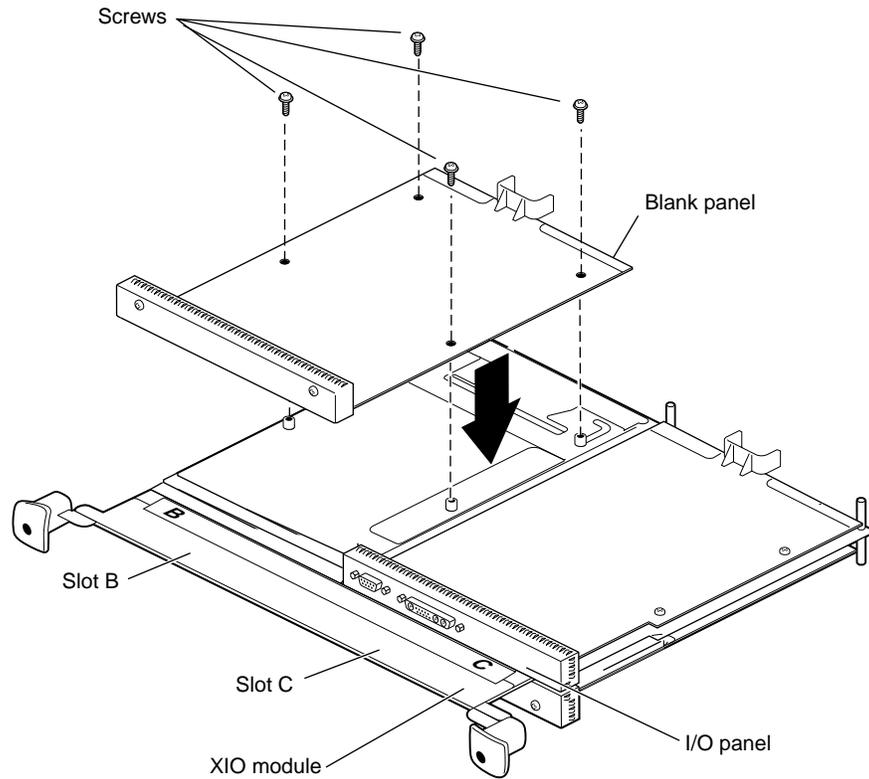
To remove the secondary OCTANE/SI or /SE graphics board, go to Chapter 1, and follow the instructions in that chapter for powering off the workstation and attaching the wrist strap. Then return to this chapter, and follow the instructions for “Removing the XIO Module,” beginning on page page 86. Then come to this section for instructions on removing the secondary OCTANE/SI or /SE graphics board.

1. Place protective caps on the compression connectors on the graphics boards.



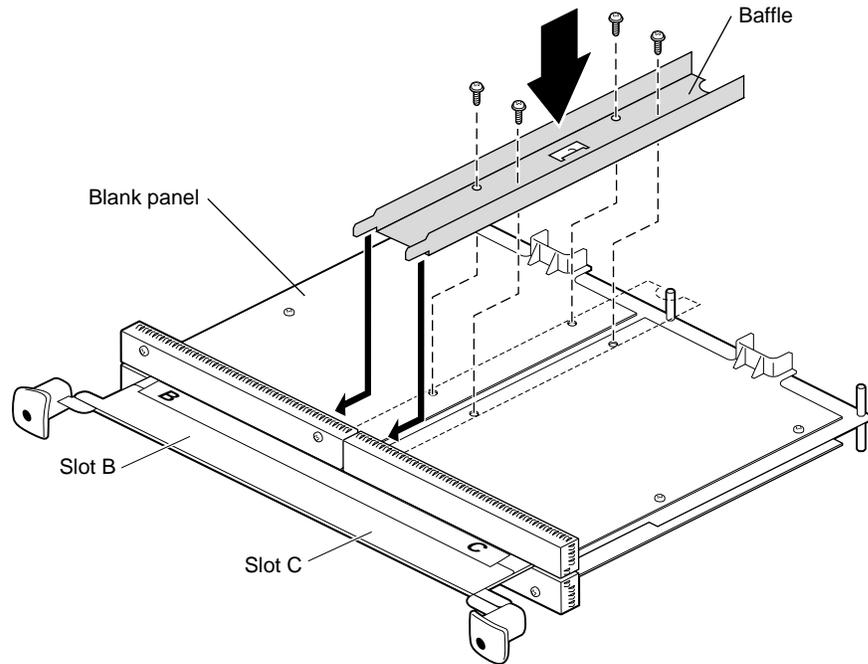
**Figure 6-14** Removing the Secondary OCTANE/SI or /SE Graphics Board

2. Remove the four screws that hold the secondary OCTANE/SI or /SE graphics board to the XIO module.
3. Place the secondary OCTANE/SI or /SE graphics board on a clean, dry, antistatic surface. Your desktop works well.



**Figure 6-15** Attaching an OCTANE/SI or /SE Graphics Board or Blank Panel to the XIO Module

4. Place a new secondary OCTANE/SI or /SE graphics board, blank panel, or other XIO board in the slot from which you just removed the secondary OCTANE/SI or /SE graphics board.
5. Use the four screws you just removed from the graphics board to secure the blank panel, graphics board, or option board to the XIO module. (Do not install the baffle unless you have two side-by-side blank panels.)



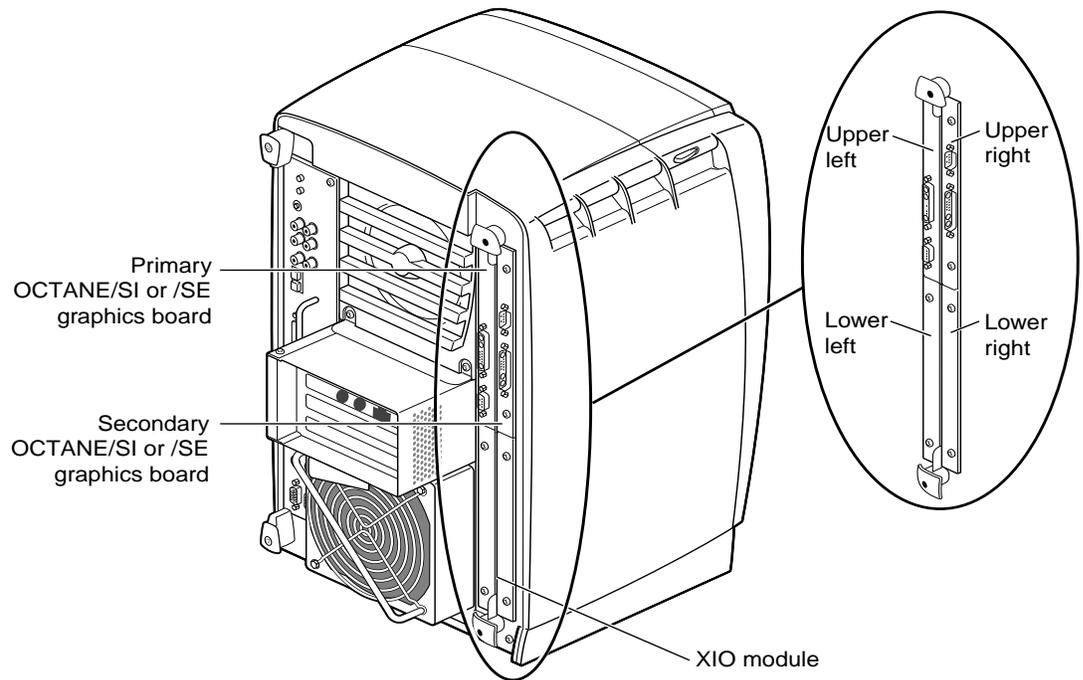
**Figure 6-16** Installing the Baffle

6. If your board configuration results in two side-by-side blank panels, install a baffle across them.
  - Remove the two inner screws from the blank panel already in place.
  - If necessary, remove two screws from the middle of the other blank panel.
  - Place the baffle over the inner edges of the two blank panels.
  - Insert four screws through the baffle and blank panels into the standoffs beneath.
7. Remove the caps from any compression connectors.

**Caution:** If you have an option board in one slot, do not attempt to install the baffle; you will damage the components on the option board.

Go to “Anticipating a Problem Area” on page 101, and read that section before replacing the XIO module.

## Anticipating a Problem Area

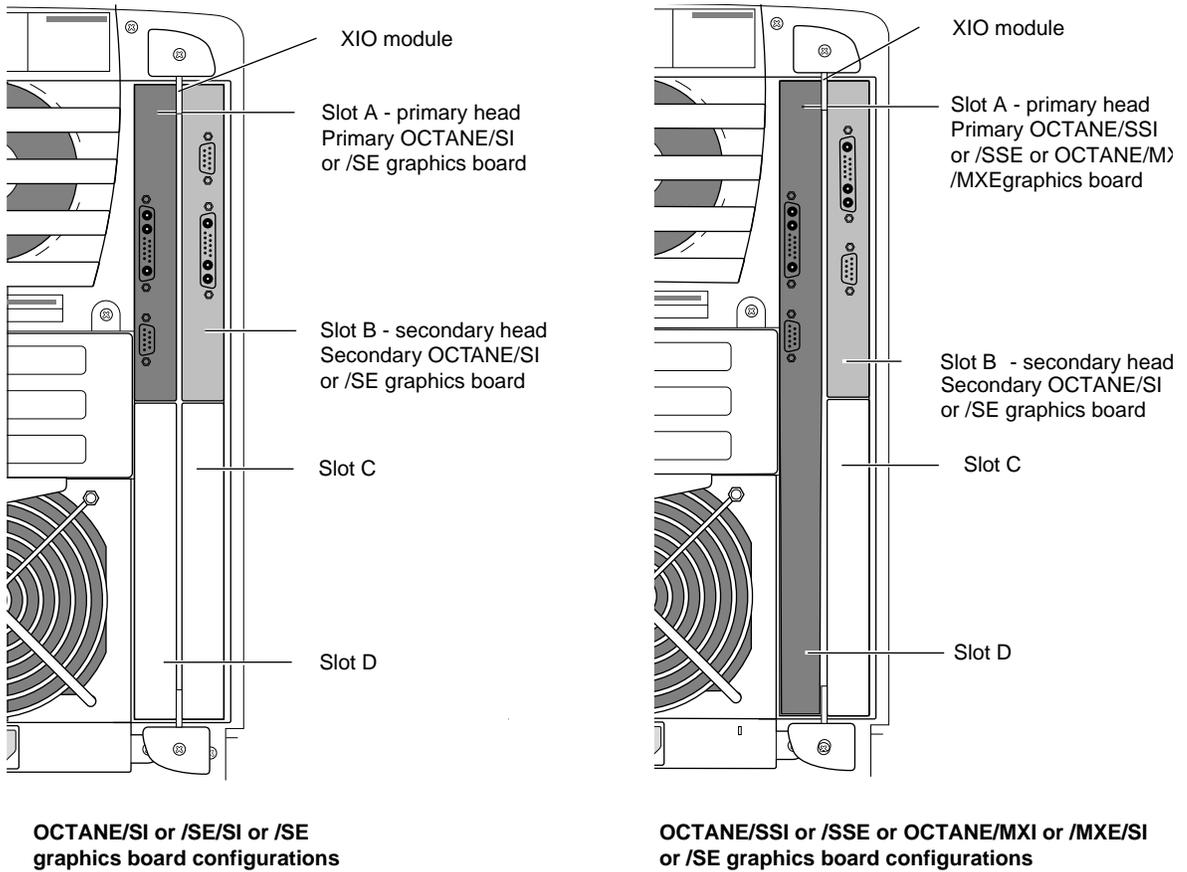


**Figure 6-17** Location of Installed Graphics Boards on the XIO Module

Be aware that location matters: The graphics boards must be placed toward the top of the workstation. If the XIO module is placed up side down, the graphics boards can overheat and be damaged.

Go to “Replacing the XIO Module” on page 102.

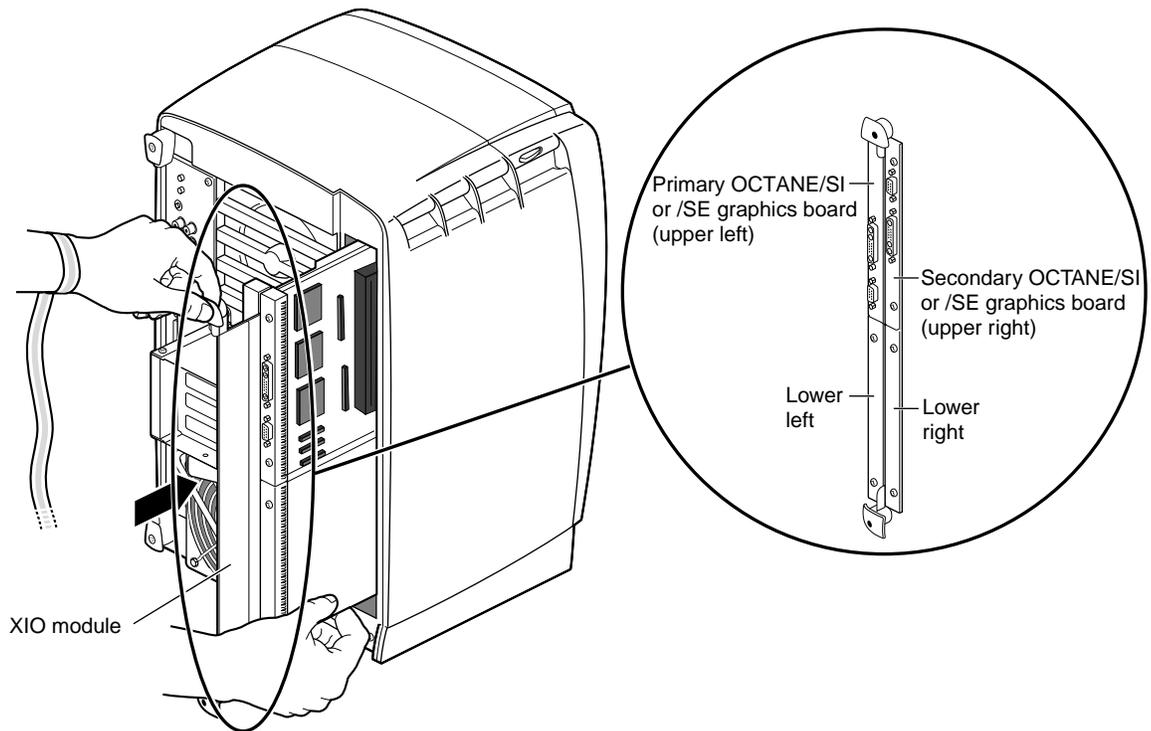
## Replacing the XIO Module



**Figure 6-18** XIO Module With Correctly Placed Graphics Boards

**Caution:** Be sure you replace the XIO module with the graphics boards at the top of the workstation. This will prevent overheating and damage to the boards. Refer to Figure 6-18.

If the XIO module is incorrectly inserted with an OCTANE/SSI or /SSE, or OCTANE/MXI or /MXE graphics board attached, a notifier appears during power-on telling you to insert the XIO module with the graphics boards toward the interior of the workstation, and stops the power-on process. Power off and follow the steps in this manual to insert the XIO module correctly.

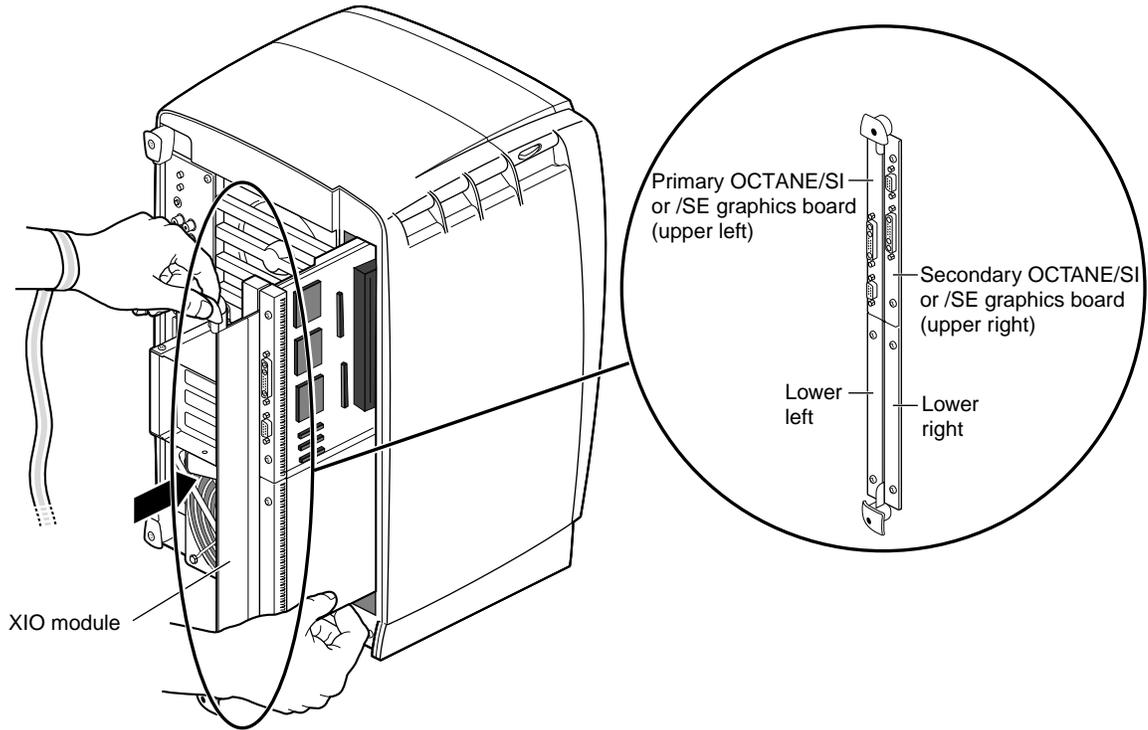


**Figure 6-19** Replacing the XIO Module

**Caution:** Replace the XIO module only with the graphics boards toward the top, as shown in Figure 6-19. The primary board must always be placed toward the upper left to avoid overheating and damage to the boards.

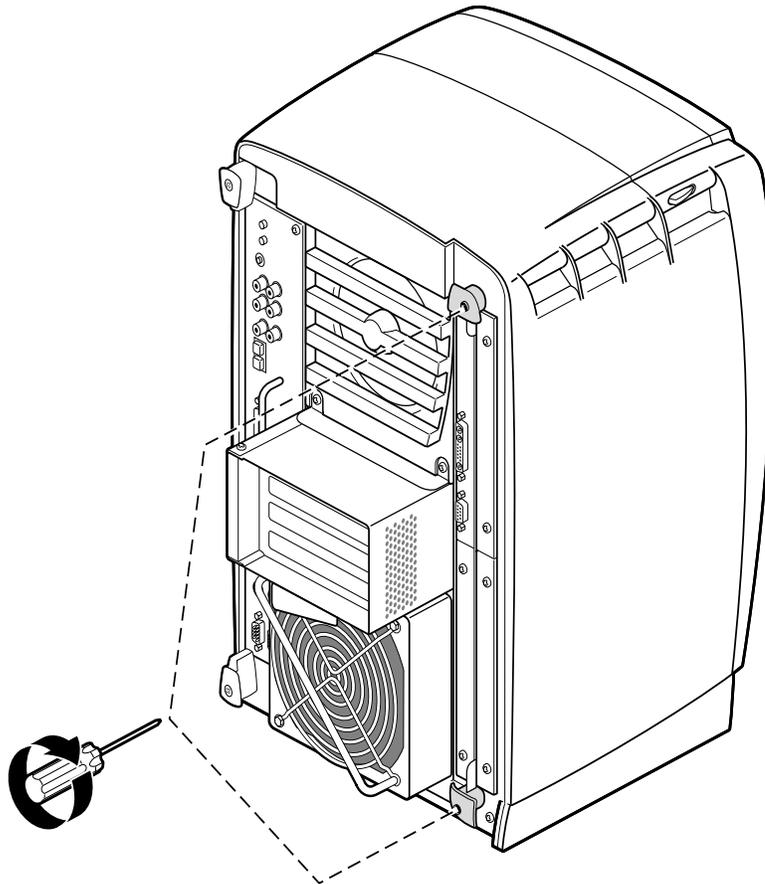
1. Replace the XIO module in the OCTANE workstation as shown in Figure 6-19. Slide the XIO module into guides on the top and bottom of the workstation.
2. Before you insert the XIO module, make sure the handle portion protrudes in a locked position from the I/O panels, as shown in Figure 6-19.

If the handles are flush with the I/O panels, the XIO module will stop during insertion. Pull out the handles, and then continue inserting the XIO module into the chassis.



**Figure 6-20** Inserting the XIO Module

3. Grasp the handle area while supporting the XIO module, and slide the module firmly into the chassis. You may need to use some force to insert this to a place where the hooks on the handles of the XIO module will attach to the workstation.
4. Use the handles to push the XIO module into a locked position. (The I/O panels are nearly flush with the workstation when properly inserted; however, there may be a slight variation in the depth of the boards.)



**Figure 6-21** Replacing the XIO Module Screws

5. Tighten the captive screws in the handles.

You are finished installing the secondary OCTANE/SI or /SE graphics board.

Go to Chapter 7 for instructions for your next tasks: connecting the two graphics monitors, the secondary keyboard and mouse, and remaining cables.



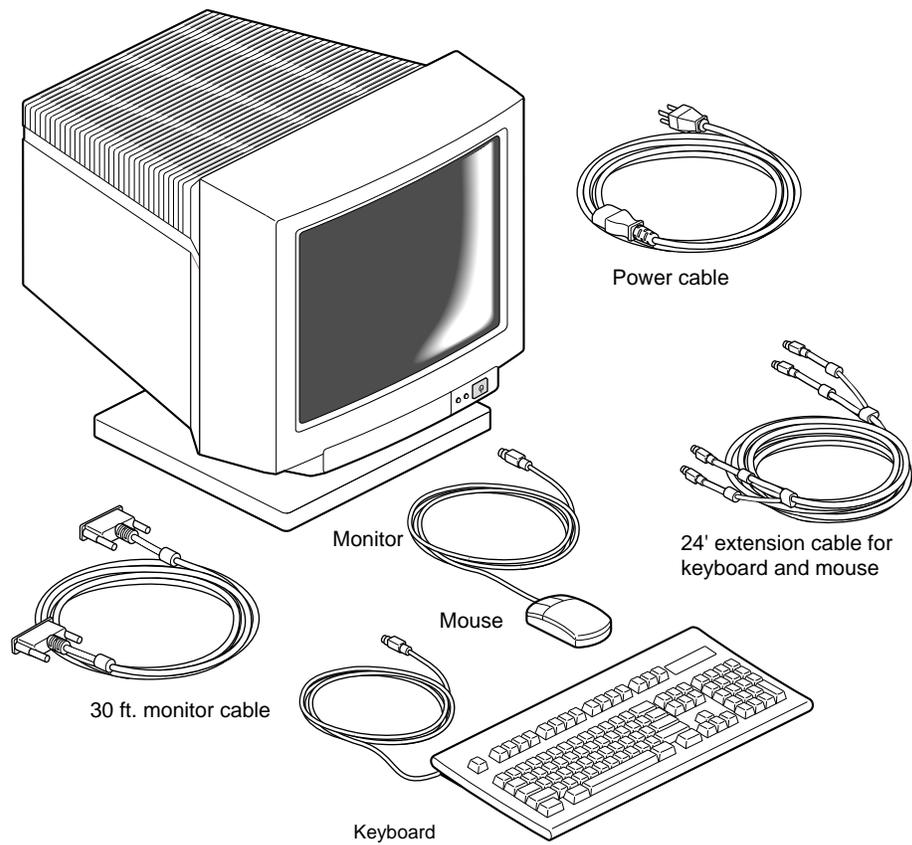
## Connecting the Secondary Monitor, Keyboard and Mouse

The Duo upgrade enables you to use a second monitor, keyboard, and mouse. This chapter tells you how to set up these peripherals, reconnect all the cables, and power on.

Tasks in this chapter include

- “Connecting Cables to the Monitors” on page 109.
- “Connecting the System Module and PCI Cables” on page 112.
- “Connecting the Power Cables” on page 114.
- “Powering on the OCTANE Workstation” on page 115.

## Collecting the Secondary Monitor, Keyboard, and Mouse Materials



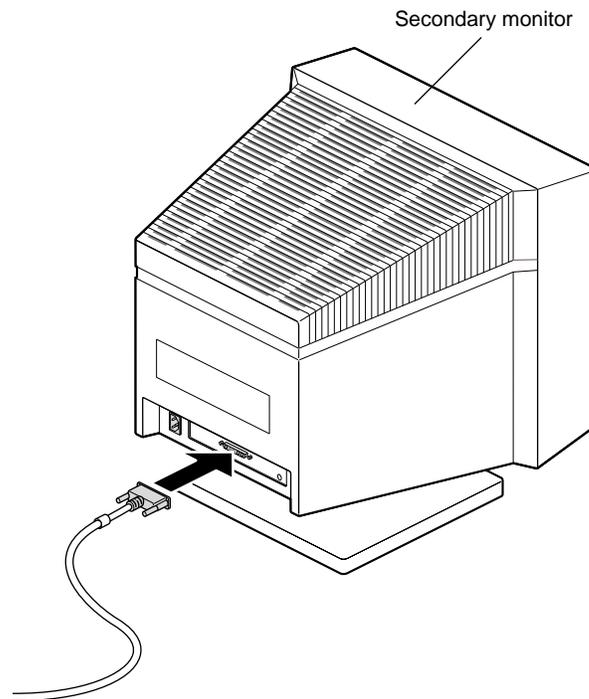
**Figure 7-1** Secondary Monitor, Keyboard and Mouse Installation Materials

The monitor ships with two cables: a monitor power cable and a monitor/workstation cable.

Unpack the secondary monitor in the work area designed for the secondary user.

**Caution:** The monitor is very heavy. Have someone help you lift it out of the box.

## Connecting Cables to the Monitors



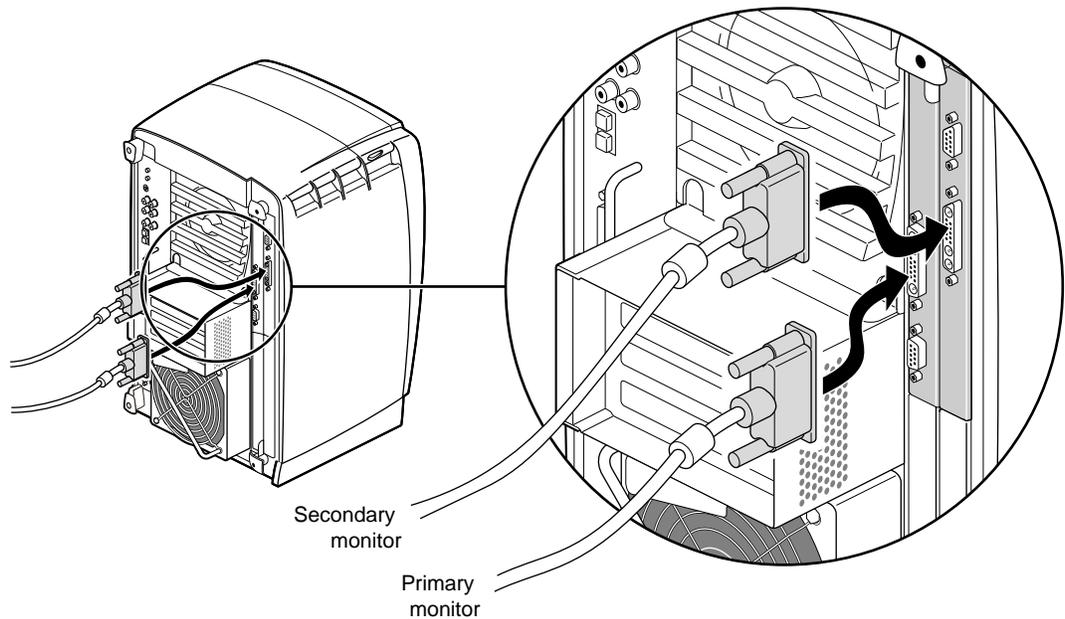
**Figure 7-2** Attaching the Monitor Cable

1. Connect one end of the extra-long monitor/workstation cable to the connector on the back of the secondary monitor. Connect and tighten the thumbscrews on both sides of the connector.
2. Reconnect the cable to the back of the primary monitor, if you disconnected it.

The next two sections provide instructions on connecting the graphics boards to the correct monitor. To determine which graphics board is in the primary graphics board position (slot A or slots D and A), look at Figure 7-4 and Figure 7-5.

**Note:** It's important that you connect the primary monitor cable to the correct monitor connector on the XIO module.

**Connecting Monitor Cables to the Workstation in an OCTANE/SI or /SE/SI or /SE, or OCTANE/SI or /SE With Texture Memory/SI or /SE Configuration**

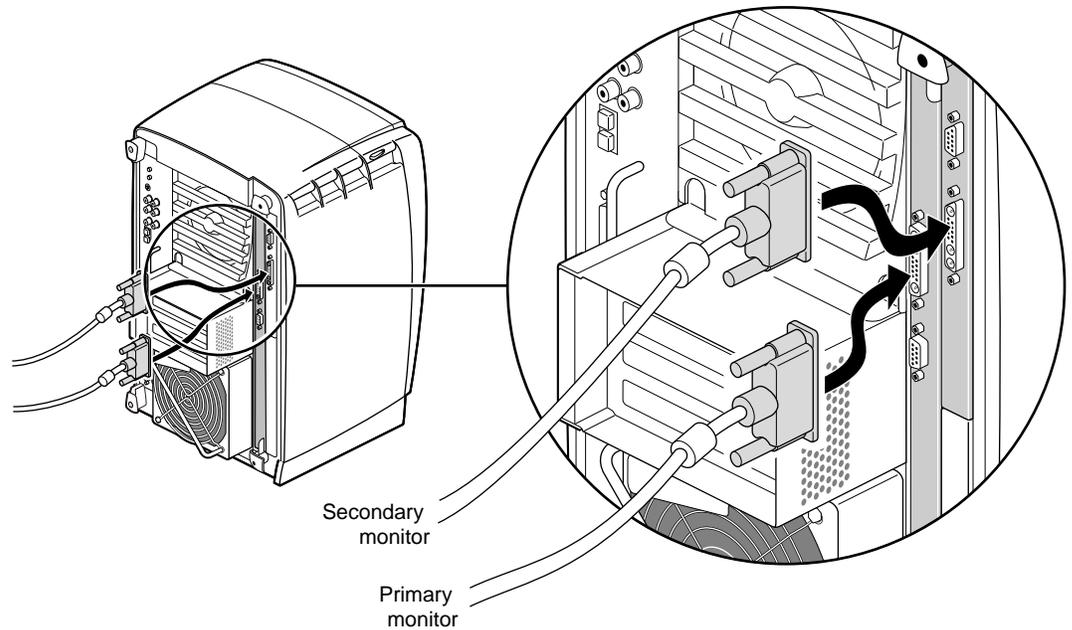


**Figure 7-3** Connecting Monitor Cables in an OCTANE/SI or /SE/SI or /SE Configuration

1. Connect the primary monitor cable to the primary graphics board in slot A, toward the top and interior of the OCTANE workstation.
2. Connect the extra-long, secondary monitor cable to the secondary graphics board in slot B, or possibly slot C. For illustration purposes, the secondary graphics board is shown in slot B.
3. Tighten the thumbscrews on both sides of the connectors.

You are finished connecting the monitor/workstation cables. Go to “Connecting the System Module and PCI Cables” on page 112.

**Connecting Monitor Cables to the Workstation in an OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE Configuration**

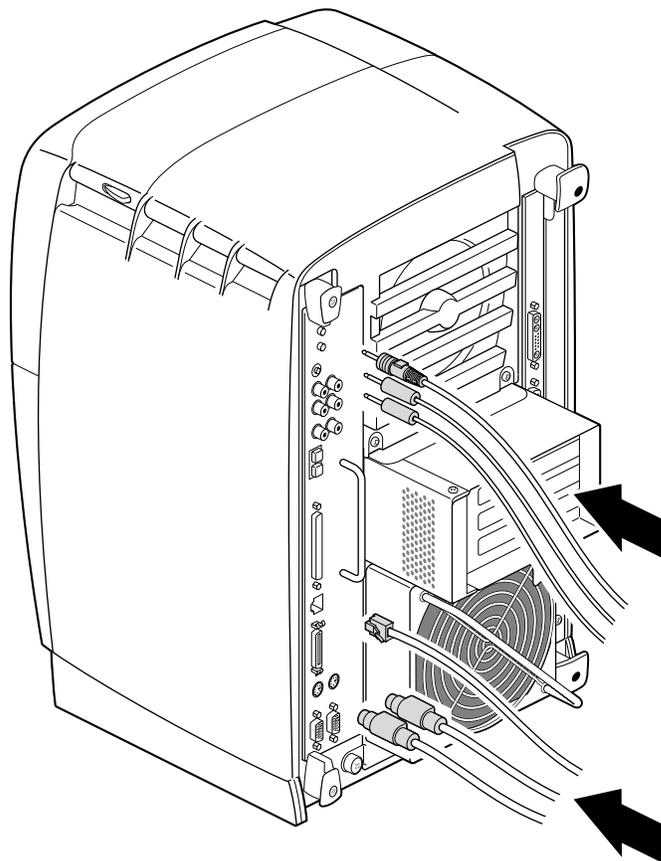


**Figure 7-4** Connecting Monitor Cables in an OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE Configuration

1. Connect the primary monitor cable to the primary graphics board in slot A (and D), toward interior of the OCTANE workstation.
2. Connect the extra-long, secondary monitor cable to the secondary graphics board in slot B or possibly slot C. For illustration purposes, the secondary graphics board is shown in slot B.
3. Tighten the thumbscrews on both sides of the connectors.

You are finished connecting the monitor/workstation cables. Go to "Connecting the System Module and PCI Cables" on page 112.

## Connecting the System Module and PCI Cables

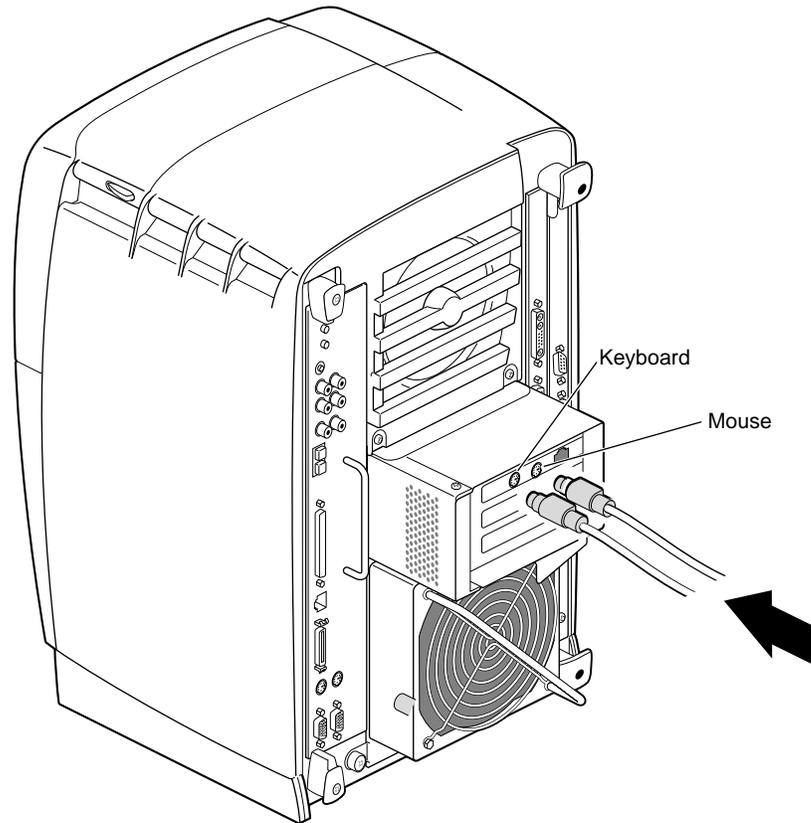


**Figure 7-5** Connecting the System Module and PCI Module Cables

1. Connect all the cables to the system module that you removed.

**Note:** The keyboard and mouse ports on the system module are interchangeable. Either port will work for either device. However, you must connect them when the system is powered off.

See Appendix A, page 147, for an illustration of the labeled ports on the back of the workstation.



**Figure 7-6** Connecting the Secondary Keyboard and Mouse Cables

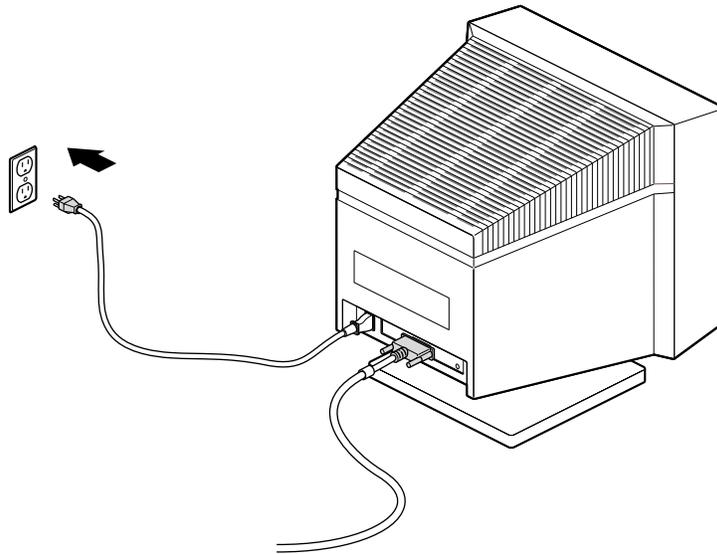
2. Connect the extra-long keyboard and mouse cables to the PCI board in the PCI module. (If you are using the Ethernet port on the PCI board, connect that cable as well.)

**Tip:** When you are plugging the mouse and keyboard cables into the PCI board ports, firmly seat the cables as they may be a tight fit.

3. Connect the other end of the keyboard and mouse cables to the keyboard and mouse in the secondary user location.

Go to “Connecting the Power Cables” on page 114.

## Connecting the Power Cables

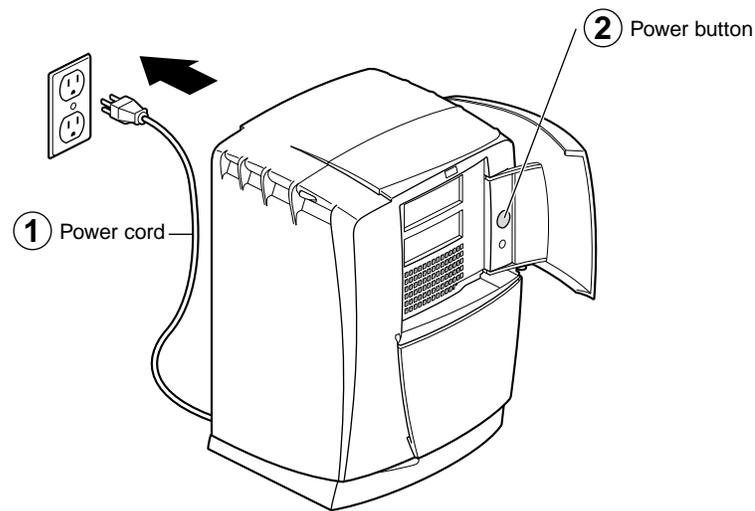


**Figure 7-7** Connecting the Secondary Monitor's Power Cable

Connect the power cable for each monitor as follows:

1. Connect the female end of the power cable to the power connector on the back of each monitor.
2. Plug the male end into a three-prong grounded electrical outlet.
3. Turn on the primary monitor and then the secondary monitor. The power switch is on the front of the monitor in the lower right corner. The LED on the switch lights up when the monitor is powered on.

## Powering on the OCTANE Workstation



**Figure 7-8** Powering On the OCTANE Workstation

Be sure to turn both monitors on *before* turning on the OCTANE workstation.

1. Plug the OCTANE power cord into an electrical outlet.
2. Push the power button on the front of the OCTANE workstation.

**Note:** Start-up diagnostics display to the primary head only.

You are finished installing the secondary monitor, reconnecting the primary monitor, and connecting all cables.

Go to Chapter 8 for instructions on your next tasks: configuring the system and verifying the hardware installations.



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## Configuring the System and Verifying the Installation

This chapter explains how to install the software needed for the Duo configuration and provides information on system setup and verifying various hardware installations.

The information in this chapter includes

- “About the Option Drive” on page 117.
- “Verifying an Internal Drive Installation” on page 118.
- “Mounting the Second Drive” on page 118.
- “Adding Swap Space” on page 119.
- “Adding Users” on page 120.
- “Configuring Input Devices” on page 121.
- “Verifying the Memory Installation” on page 123.
- “Verifying the PCI and Graphics Board Installations” on page 124.
- “Selecting the Head on Which a Program Runs” on page 125.
- “Changing to a Dual Head System” on page 125.

### About the Option Drive

Internal SCSI devices (drives) are automatically given an address when they are inserted. Bus 0 (internal devices) has addresses such as 0-1, 0-2, 0-3; the system drive is SCSI ID 0-1, the option drive above it is SCSI ID 0-2, and the option drive at the top of the workstation is SCSI ID 0-3.

**Tip:** To determine the total capacity and megabytes available on your disks, go to the Toolchest > System > File System Manager and click the *Get Info* button.

## Verifying an Internal Drive Installation

The workstation automatically sets up the system software for most internal devices you install and places an icon on the desktop.

Once you install the drive, follow these steps to check that the system recognizes the new drive.

1. Log in to the root account. For more information on logging in, refer to the *OCTANE Workstation Owner's Guide*, "Logging Into the OCTANE Workstation," on page 20.
2. If the device is installed correctly, you see an icon for it on the desktop. Double-click the icon to mount the drive.
3. You can also use the System Manager to check that the drive is shown correctly.
  - From the Toolchest choose > System > System Manager > Hardware and Devices > Disk Manager. You see a list of installed drives.
  - Choose the drive, and click the *Get Info* button.

If the drive you installed does not appear, try opening a UNIX shell and typing `hinv`. Sometimes the Desktop does not cause the icon to appear. If the drive does not appear to be installed, power off the system and make sure the drive is completely seated in the slot. Then restart the system and check the System Manager listing again.

## Mounting the Second Drive

For the second drive to be usable, it needs to be mounted. To mount the drive, follow these steps:

1. Log in as root.
2. Double-click the icon representing the second hard drive. The icon is identified, for example, as Disk(0,2) or Disk(0,3). The Disk Panel dialog box appears.
3. From the Common Task List, double-click on the Mount Local File System icon.
4. Click *Next*.
5. In the window that appears, type a mount point, for example, `/d2`.
6. Click *Next*.

7. Set up the disk to allow the users to change the contents of the second disk's filesystem.
8. Choose to mount the second disk with each system start.
9. Click *OK* twice.

The disk is now mounted.

## Adding Swap Space

The following procedure is a recommendation for creating a swap file on the second drive. Create more swap space only if you believe the 128 MB of swap space on the system disk is insufficient and you know how much more disk space you want to add.

**Note:** The swap space on the system disk must have a different priority number than the swap space on the second (option) disk.

To set up additional swap space, determine the amount of swap space on the system disk, and use that as a guideline to set up more swap space.

1. From the Toolchest, choose System > System Manager > System Performance > Swap Manager.
2. When the Swap Manager window appears, note the amount of swap space (found in the Physical column) that exists on the system disk.
3. Click *Add*.
4. Click *Next*.

**Note:** At this point you can choose to add additional swap space to either disk.

The Add Real Swap Space dialog box appears. (Read all the information in every dialog box.)

5. At step 2 in the dialog box, type in your chosen amount of swap space. You may enter the same amount that was on the system disk, 128 MB. You can enter a different value.
6. At step 3 in the dialog box, select the filesystem that represents the disk to which you've chosen to add the swap file, for example, `/dev/dsk/sks0d3s7`.

7. Click *Next*.
8. Click *OK* twice.

You are finished adding swap space.

For additional information on adding swap space, from the Toolchest > Help > Online books > SGI Admin > *IRIX Admin: System Configuration and Operation*, see Chapter 6, “Configuring Disk and Swap Space,” and *IRIX Admin: Disks and Filesystems*.

## Adding Users

It is recommended that you place all user accounts on the second disk.

To add an additional user, follow these instructions:

1. From the Toolchest, choose System > System Manager > Select Security and Access Control.
2. Double-click the Add a User Account icon.  
The dialog box appears. Read the information in this and every dialog box before proceeding.
3. Click *Next*.
4. Type a login name for the new user.
5. Click *Next*.
6. Type the new user’s full name.
7. Click *Next*.
8. Press *Next* to accept the Local Account default.
9. Choose one of the Password options.
10. Click *Next*.
11. To accept the unique, automatically generated User ID (number), click *Next*.
12. To accept the default Primary Group of the second user, click *Next*.

13. In the Home Directory window, remove the default `"/usr/people/login"` name.  
Because it is recommended that you place all users on the option disk, rather than the system disk, replace the default `"/usr/people/login"` name with the home directory of the new user on the option disk.
14. In the Home Directory window, type the path to a location on the disk to which you added the additional user. For example, `/mountpoint/loginname, /d2/username`.
15. To accept the default Shell Program, `csch`, click *Next*.
16. Confirm that the settings are correct, and click *OK*.

You are finished adding the additional user.

## Configuring Input Devices

The IRIX operating system includes support for a number of input devices. Support for additional devices can be added; see *man in put - input devices*, Custom Input Devices. This man page also contains the most current listing of supported devices.

1. Choose the serial port (1 or 2) to which you will connect the serial device for head 1.  
**Tip:** Configure the serial device for head 1, the secondary head first. Then configure the serial device for head 0, the primary head.
2. Use head 0, the primary head, to do the configuration. (All system administration tasks are done from head 0.)

### Configuring a Serial Device for Head 1

1. From head 0, choose the Toolchest > System > System Manager > Hardware and Devices > Serial Device Manager > Add a Serial Device.
2. Read all the information in each dialog box that appears, and follow the directions in each dialog box.  
You have configured the device to head 0. You next open a shell and enter a command to change the configuration to head 1.
3. Check Table 8-1 on page 123 for the module name of the serial device you have configured.
4. From the Toolchest > Desktop, open a UNIX shell.

5. At the prompt, type `mv /dev/input/ module name /dev/input1/ module name .`  
Example: `mv /dev/input/sball /dev/input1/sball .`  
In this example, `/input/` refers to head 0, and `sball` to Spaceball; `/input1/` refers to head 1.
6. Log out, and log in on the head for which the device was configured.

You are finished configuring a serial device to head 1.

### Configuring a Serial Device for Head 0

1. From head 0, choose the Toolchest > System > System Manager > Hardware and Devices > Serial Device Manager > Add a Serial Device.
2. Read all the information in each dialog box that appears, and follow the directions in each dialog box.
3. Log out, and log in on head 0.

You are finished configuring a serial device to head 0.

### Listing Serial Devices

To get a list of devices configured to head 0 or head 1, follow these steps:

1. From the Toolchest > Desktop, open a UNIX shell.
2. For devices configured for head 0, the primary head, at the prompt type  
`cd /dev/input/ .`

For devices configured for head 1, the secondary head, at the prompt type

```
cd /dev/input1/ .
```

3. At the prompt type `ls -l .`

You see something like:

```
keyboard -> /hw/input/keyboard
mouse -> /hw/input/mouse
sball -> /hw/ttys/ttyd1
```

Sball is the module name for Spaceball, supported on head 0 and connected to serial port 1. See Table 8-1 for the module names of supported serial devices. See *man input - input devices* for the most current listing of supported devices.

**Table 8-1** Serial Devices and Their Modular Names

Device	Module Name
Calcomp tablet	tablet
Hitachi HDG-J tablets	hitachi
Other Hitachi tablets	tablet
Wacom tablets	wacom
Dial box	dialbox
Button box	dial
Dial and button box combination	dial
Imp infra-red presentation mouse	imp
Logitech Magellan 3D controller	magellan
Spaceball	sball

## Verifying the Memory Installation

- From the Toolchest, choose System Manager > Hardware and Devices > About This System and check the amount of memory listed after the Main Memory heading.  
The amount of memory shown should equal the amount of memory you installed. For example, if you originally had 64 MB, then installed two 32 MB DIMMs, the System Manager should show that you have 128 MB of memory.
- If the amount of memory is incorrect, follow the directions in Chapters 1 and 2 to power off your system and check the installation or removal procedure.
  - Check the angle of the DIMMs. They should be upright and completely seated.
  - Check that each bank is populated with two DIMMs, and that they are the same type. You must have an even number of DIMMs installed.

- Check the color of the label on the DIMM. Both DIMMs in a bank must be the same with the same colored label.
- Complete the installation or removal procedure. If, after you have powered on the OCTANE workstation, checked the amount of memory in “About This System,” and found that the amount of memory that is registered is still incorrect, see Chapter 10, “Troubleshooting.”

## Verifying the PCI and Graphics Board Installations

You can verify your PCI and graphics board installations by using the *hinv* command

To verify that your PCI and graphics boards are recognized, follow these instructions:

1. From the Toolchest > Desktop, open a UNIX shell.
2. At the prompt, type **hinv**
3. Look for two lines similar to this:

Integral Fast Ethernet: ef0, version 1

Integral Fast Ethernet: ef1, version 1

The first line tells you that the Ethernet port on the system module is recognized. It is designated ef0. The second line gives you confirmation that the PCI board with Ethernet, keyboard, and mouse is recognized. This is the ef1 designation.

4. Look for two lines similar to: Graphics board: MXI or MXE and Graphics board: SI or SE. The first graphics board listed is the primary graphics board (head 0). In this example the primary graphics board is OCTANE/MXI or /MXE and the secondary graphics board is OCTANE/SI or /SE (head 1).

See Chapter 10, “Troubleshooting,” if your Duo system is not operating properly.

Go to Chapter 9, “Using the Duo System,” and read the information about using the Duo system.

## Selecting the Head on Which a Program Runs

During an interactive session with the Window Manager, you can use the `DISPLAY` environment variable to control the head on which newly started graphics programs run. When `DISPLAY` is set to `":0.0,"` programs you start run on head 0 (the primary head); when it is set to `":1.0,"` programs you start run on head 1 (the secondary head).

For convenience, the default startup files (*.login*, *.profile*) for *root* and *guest* shells set `DISPLAY` to a reasonable initial value, if it is not already set. Each head has a toolchest that can be used to invoke graphics programs. Each toolchest has the `DISPLAY` variable in its environment set to the correct value for the head on which it appears, so any application you invoke from a toolchest inherits this `DISPLAY` value, and thus appears on the same head as the toolchest from which it was invoked.

Similarly, programs started by clicking an icon appear on the head from which you invoked them.

Once a program has been launched, it is impossible to move it from one head to another from the Window Manager.

Go to Chapter 9, "Using the Duo System," and read the information about using Duo. Also see Appendix C, "Programming Tips."

## Changing to a Dual Head System

To change your Duo system to a Dual Head system, follow these instructions:

1. From the Toolchest > Desktop, open a UNIX shell.
2. At the prompt, type: `cp /var/x11/xdm/Xserver.orig /var/x11/xdm/Xserver.`
3. Shutdown the system.
4. Unplug the second keyboard and mouse.
5. Restart the system.
6. Refer to the *Dual Head Installation Guide* for information about the Dual Head system. To access the online Technical Publications Library, open your Web browser and enter `http://techpubs.sgi.com/library/`.



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## Using the Duo System

This chapter provides information for using the Duo system. The OCTANE workstation was designed for a single user. This chapter helps you become aware of some of the idiosyncracies of dual usage, and provides you with instructions for specific tasks.

Be sure you have read the README file on the Duo CD that directs you to the location of the release notes. The release notes direct you to the correct software and patches, and any other information you may need about the Duo system.

When using the Duo system, keep this information in mind:

- Simultaneous use in the same account by users on head 0 and head 1 is not supported.
- System start up, shut down, and warning messages appear only on the primary head, as does the System Maintenance Menu.
- Use the Search for Files command from the Toolchest > Find, rather than File QuickFind or Host QuickFind; these pop up simultaneously on both heads 0 and 1.
- If a System Administrative tool launched from the Desktop does not complete a function, despite being supplied with the root password, perhaps the same application is running under a second account on the Duo system.

**Table 9-1** Tasks With Duo-Specific Instructions

Task	Instruction
Determine the head on which you are running.	From the Toolchest, open a UNIX shell At the prompt, type <code>printenv DISPLAY</code> . Look for the listing <code>DISPLAY = 0.0</code> or <code>DISPLAY = 1.0</code> . Head 0 is the primary head. Head 1 is the secondary head.
System administration tasks.	Use Head 0.

**Table 9-1 (continued)** Tasks With Duo-Specific Instructions

Task	Instruction
Logging in to a remote system from the secondary head (1).	<p>From the secondary head (1) Toolchest, open a UNIX shell. Login to the remote system. Type <b>rlogin guest@remotehost</b></p> <p>At the prompt, type: <i>setenv DISPLAY &lt;localhost&gt;:1</i>.</p> <p>The screen information from the remote host displays to the secondary head (1). Without entering this command, the remote screen appears on the primary head (0).</p> <p>When using rsh, use <b>rsh usr@remote host -display localhost:1</b>. This command brings the output to head 1.</p> <p>To run an application from a remote host and displayed on head 1, use <b>rsh remotehost applicationname -display localhost:1</b>.</p>
Using an icon to launch an application.	<p>Launch the application from the head you want to use. The icon always appears on the head from which it was launched.</p>
Changing a monitor setting.	<p>After changing the setting, always log out and then log in.</p>
Hotplugging a mouse, keyboard, Spaceball, etc.	<p>Hotplugging any serial device is not supported. (Hotplugging: Attaching a device while the system is powered on.)</p>
Configuring <i>ef0</i> and <i>ef1</i> .	<p><i>ef0</i> and <i>ef1</i> cannot be configured with the same hostname and IP address even though both interfaces are on the same system.</p>
Using audio when the Duo system is enabled.	<p>Audio is not supported when the Duo system is enabled. Power off the speakers when the Duo system is enabled.</p>
Using audio when the OCTANE workstation is used as a single seat.	<p>Audio is supported when the OCTANE workstation is used as a single seat, and the Duo system is disabled.</p>

---

## Troubleshooting

This chapter provides you with troubleshooting information for the Duo system and one diagnostic test. See Table 10-2 for information about specific symptoms and remedies.

Be sure you have installed any software that came with the shipment.

### Troubleshooting Tips

Use the table below to solve problems with the Duo system. Also see the *OCTANE Workstation Owner's Guide* for additional troubleshooting information.

**Table 10-1** Troubleshooting Tips

Symptom	Probable Cause	Solution
System won't boot.	System module is not fully seated, or has a compression connector cap attached.	Go to Chapter 3 for instructions on removing and re-seating the system module and checking the compression connectors.
	XIO module is not completely seated, is in upside down, or has a compression connector cap attached.	Go to Chapter 6 for instructions on removing the XIO module, checking the compression connector, and re-seating the XIO module.
	PCI module is not fully seated or a compression connector cap is attached.	Go to Chapter 5 for instructions on removing the PCI module, checking the compression connector, and re-seating the PCI module.
	Power cords are not completely attached.	Check the connections on all power cords.
Graphics on the screen are incomplete.	A newly installed texture memory option board may not be fully seated.	If you installed a texture memory option board with the Duo upgrade, see the installation guide for this product and check that the texture memory option board is fully seated.

## Information Specific to the XIO Graphics Boards

The troubleshooting information in the rest of this chapter refers to the two XIO graphics boards.

### Primary Head Default

If the board attached to the primary monitor is removed, the secondary board, by default, becomes the primary head.

### Blank Screen or Screen With Faulty Images

**Table 10-2** Troubleshooting Tips - Screen Problems

If you see:	Take this action:	Second Step:	Third Step:
	First Step		
Blank screen or screen with faulty images: OCTANE/SI or /SE/SI or /SE, or /SI or OCTANE/SE with texture memory board/SI or /SE configuration.	<ol style="list-style-type: none"> <li>1. Use the <i>gfxinfo</i> command, (instructions given in "Using the <i>gfxinfo</i> Command" on page 131).</li> <li>2. Read info in the file.</li> </ol>	<p>If both graphics boards appear in the inventory, call your service representative.</p> <p>If only one board appears in the inventory, do the diagnostic test in this chapter.</p>	<p>Call your service representative to report software problems or to order a new graphics board.</p>
Blank screen or screen with faulty images: OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE configuration.	<ol style="list-style-type: none"> <li>1. Use the <i>gfxinfo</i> command (instructions given in "Using the <i>gfxinfo</i> Command" on page 131).</li> <li>2. Read info in the file.</li> </ol>	<p>If both graphics boards appear in the inventory, call your service representative.</p> <p>If only one board appears in the inventory, do the diagnostic test in this chapter.</p>	<p>Call your service representative to report software problems or to order a new graphics board.</p>

## Using the `gfxinfo` Command

If one of your monitor screens is blank or has faulty images, you can make some determination of the problem by using the `gfxinfo` command. On a correctly functioning system, two lines of this file tell you Graphics board 0 is `'IMPACTSR'` graphics, and Graphics board 1 is `'IMPACTSR'` graphics. Board 0 is connected to the primary head, and board 1 is the board connected to the secondary head.

Follow these steps to determine which graphics boards the system is identifying.

1. Go to the Toolchest > Desktop > Open Unix Shell to open a shell.
2. On the command line, type `/usr/gfx/gfxinfo`

On a system with a blank screen or a screen with faulty images, you may have one of two types of information reported.

- If you see Graphics board 0 is `'IMPACT'` graphics, and Graphics board 1 is `'IMPACT'` graphics, call your service representative.
- If you see only one board reported, complete the diagnostic test in this chapter to determine if the problem is software- or hardware-based.

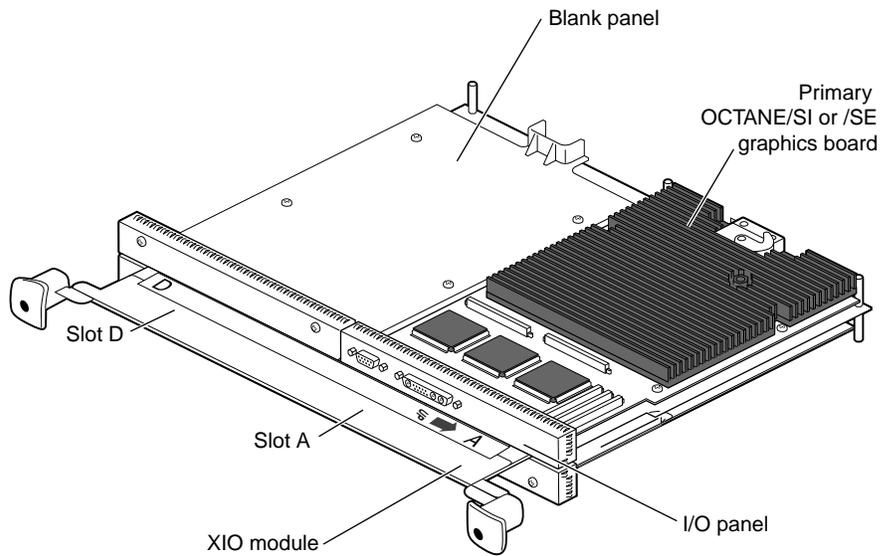
## Performing the Diagnostic Test

Performing this diagnostic test tells you if the blank screen or faulty images are due to a faulty graphics board or faulty software. If a board in slot A, for example, is not recognized at the beginning of the test, is moved to another slot, and is still not recognized, the board is faulty. If the board in slot A, is not recognized in slot A, but is recognized in the alternate slot, the software is faulty.

**Caution:** You must not swap your OCTANE/SSI or /SSE or OCTANE/MXI or /MXE into slots B and C. The boards overheat and are damaged if they are placed toward the exterior of the workstation.

For instructions on performing the diagnostic test, go to the section in this chapter written for your configuration. See “Diagnostic Test for an OCTANE/SI or /SE/SI or /SE Configuration” on page 132 or “Diagnostic Test for an OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE Configuration” on page 136.

### Diagnostic Test for an OCTANE/SI or /SE/SI or /SE Configuration

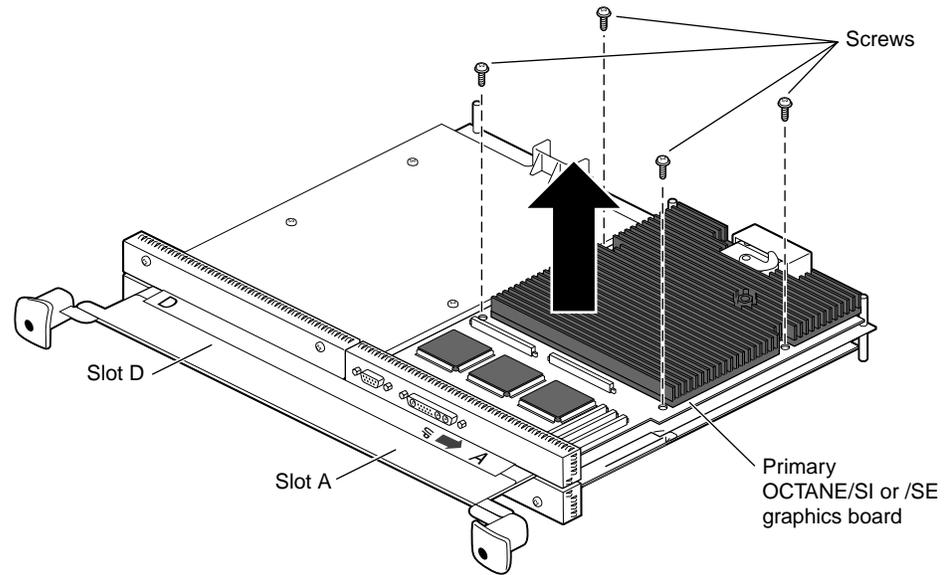


**Figure 10-1** OCTANE/SI or /SE Graphics Board in Slot A

This test is used to determine whether the problem is with the graphics board or with the software that polls a graphics slot.

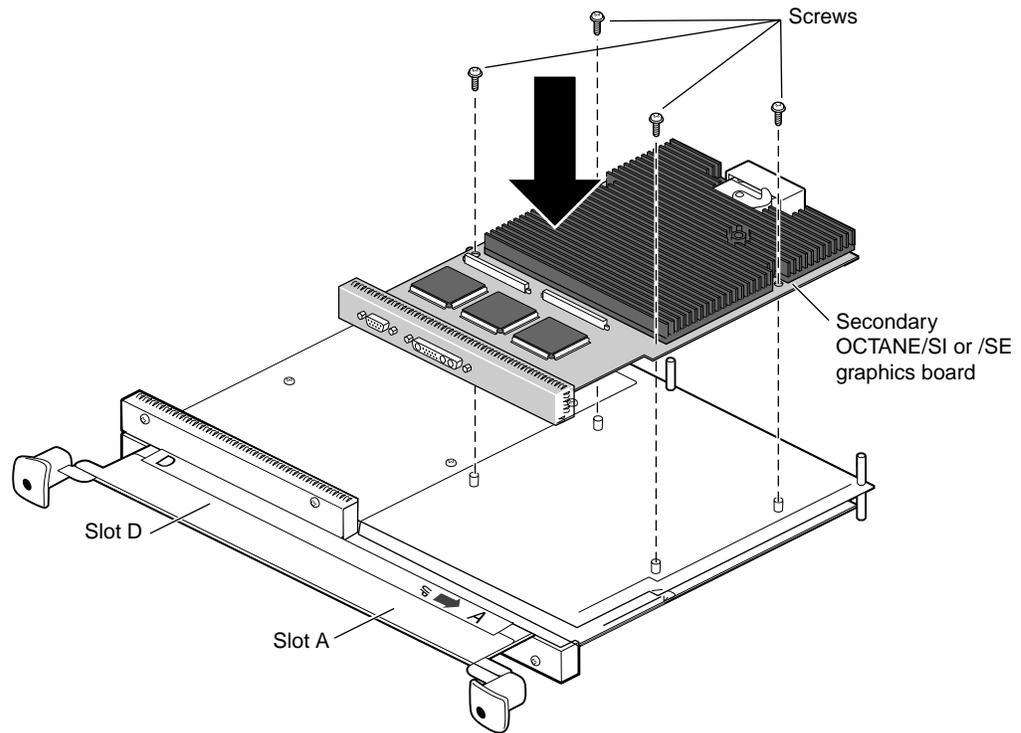
Follow the instructions in this section to remove both graphics boards, and place the secondary OCTANE/SI or /SE graphics board in slot A.

1. Go to Chapter 1, pages 3 - 8 for instructions on powering off the OCTANE workstation. Then go to Chapter 6, "Removing the XIO Module" on page 86 and follow the directions through removing the XIO module. Then return here and go to step 2.
2. Place protective caps on the XIO compression connectors on the graphics boards.
3. Determine where on your desk you will place each board, so you can determine which board was in which slot.



**Figure 10-2** Removing the Primary OCTANE/SI or /SE Graphics Board From the XIO Module

4. Remove the four screws that hold the OCTANE/SI or /SE graphics board in slot A to the XIO module.
5. Lift the OCTANE/SI or /SE graphics board off the XIO module, and place it on a clean, dry, antistatic surface. Your desktop works well.
6. Turn the XIO module so that the secondary OCTANE/SI or /SE graphics board faces you.
7. Follow steps 4 and 5 to remove the secondary OCTANE/SI or /SE graphics board.
8. Place the secondary OCTANE/SI or /SE graphics board into slot A.
9. Replace the four screws.
10. Turn the XIO module so you are facing the empty slot that held the secondary OCTANE/SI or /SE graphics board.



**Figure 10-3** Placing the Secondary OCTANE/SI or /SE Graphics Board Into Slot A

11. Insert a blank panel in the slot that held the secondary OCTANE/SI or /SE graphics board.
12. Replace the four screws.
13. Remove the caps from the compression connectors.
14. Go to Chapter 6, "Replacing the XIO Module" on page 102 and follow the directions for replacing the XIO module through powering on the workstation. Then return here and go to the next section for instructions on checking and diagnosing the configuration.

## Checking and Diagnosing the Configuration

**Table 10-3** Diagnostic Test Results: OCTANE/SI or /SE/SI or /SE, or OCTANE/SI or /SE With Texture Memory Board/SI or /SE Configuration

Original State of Board in Slot A or Slots A and D	State of Secondary Graphics Board in the Primary Graphics Board Slot	Solution
1. The primary head displayed a blank or faulty image.	The secondary head displayed a blank or faulty image.	Software problem; call your authorized service representative.
2. The primary head worked properly.	The secondary head works properly.	Software problem; call your authorized service representative.
3. The primary head displayed a blank or faulty image.	The secondary head works properly.	Primary graphics board may be faulty; call your authorized service representative.
4. The primary head worked properly.	The secondary head displays a blank or faulty image.	Secondary graphics board may be faulty; call your authorized service representative.

## Returning the Graphics Boards to Their Original Positions

After performing this diagnostic test, return the graphics boards to their original positions. Follow the directions in this section.

1. Go to Chapter 1, pages 3 - 8 and follow the directions for powering off the workstation and attaching the wriststrap. Then go to Chapter 6, "Removing the XIO Module" on page 86, and follow the instructions through removing the XIO module. Then return here for instructions on returning the graphics boards to their original positions.
2. Place caps on the compression connectors.
3. Remove the graphics board from slot A. In an OCTANE/SI or /SE/SI or /SE configuration, place the OCTANE/SI or /SE graphics board on your desk so you can determine which of the OCTANE/ SI or /SE boards was removed from which slot.
  - Remove the four screws holding the graphics board to the XIO module.
  - Lift the board off the XIO module and place it on a clean, dry, antistatic surface.

4. Turn the XIO module until you are facing the secondary OCTANE/SI or /SE graphics board.
5. Remove the secondary OCTANE/SI or /SE graphics board from its slot.
  - Remove the four screws holding the graphics board to the XIO module.
  - Lift the board off the XIO module.
6. Place the board from slot A into the slot that held the secondary OCTANE/SI or /SE graphics board.
7. Insert and tighten the four screws that hold the board to the XIO module.
8. Repeat the installation process into slot A for the other OCTANE/SI or /SE graphics board.
9. Remove the caps from the compression connectors.
10. Go to “Replacing the XIO Module” on page 102 and follow the directions for replacing the XIO module through powering on the workstation. Then call your authorized service representative with the results of your diagnostic test.

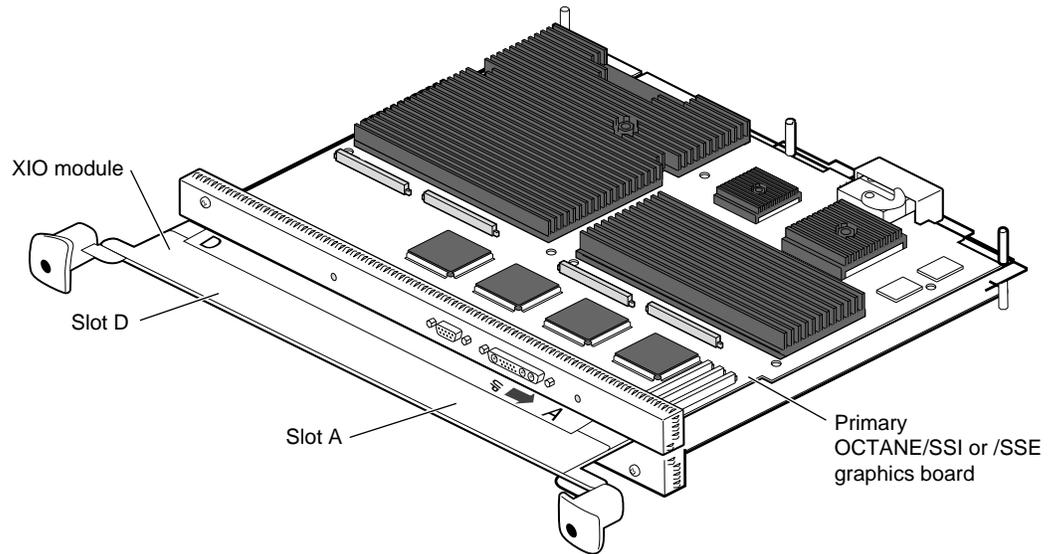
### **Diagnostic Test for an OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE Configuration**

This test is used to determine whether the problem is with OCTANE/SI or /SE graphics board, or with the software that polls a graphics slot.

The diagnostic test for the OCTANE workstation with an OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE configuration is different from an OCTANE/SI or /SE/SI or /SE, or OCTANE/SI or /SE with texture memory option board/SI or /SE configuration.

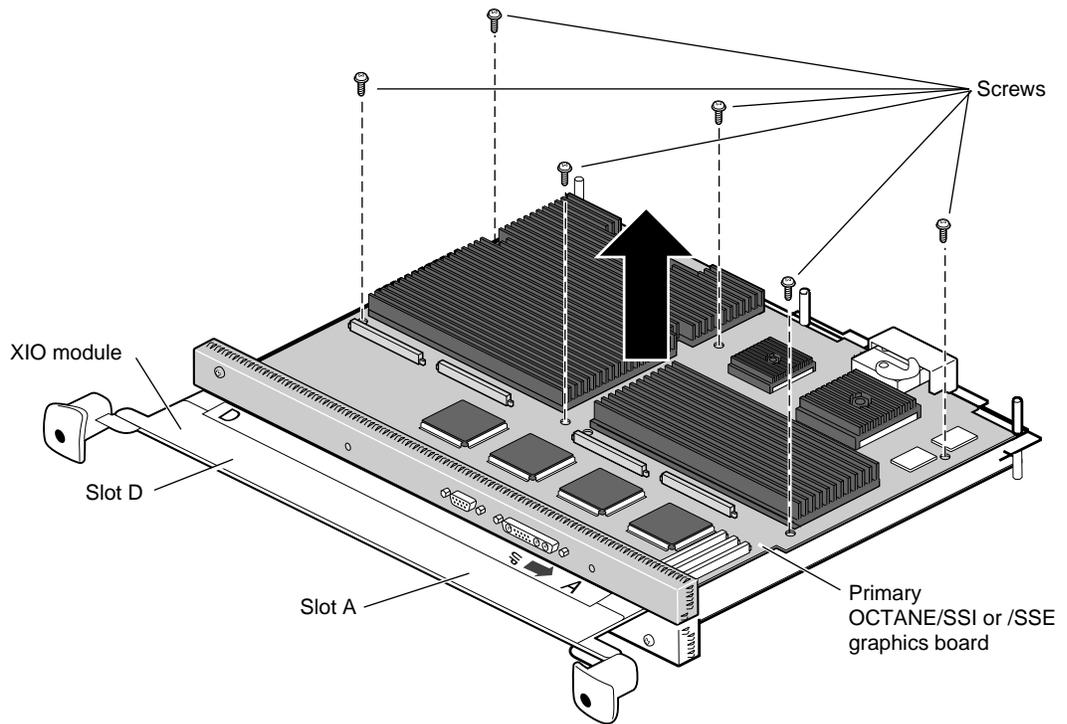
You cannot swap the heads in an OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE configuration. However, you can place the secondary head in slot A to see if it is recognized.

Follow the instructions in this section to remove both graphics boards, and place the OCTANE/SI or /SE graphics board in slot A.



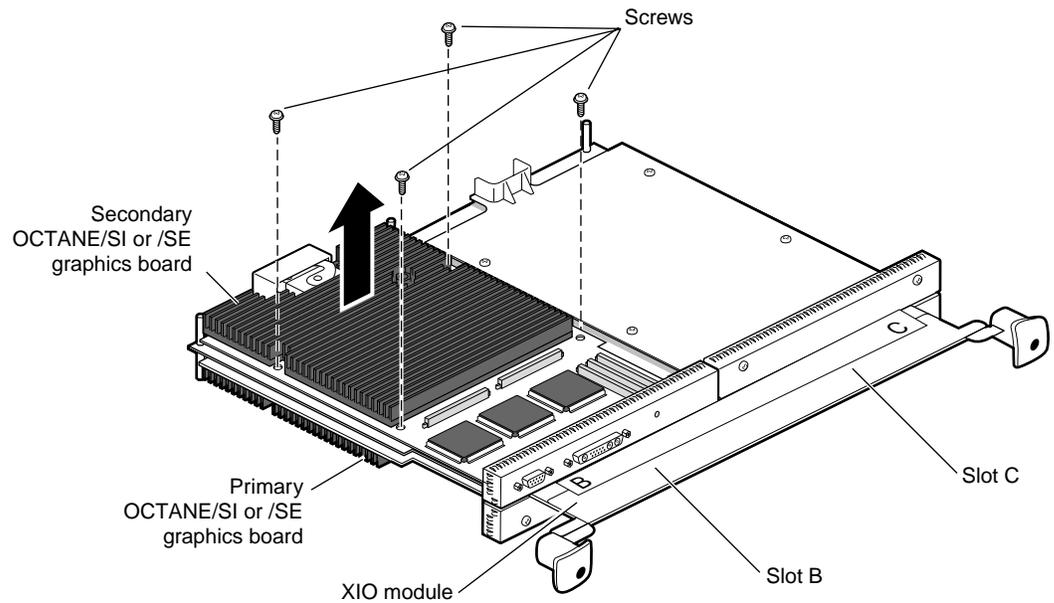
**Figure 10-4** Identifying the Primary OCTANE/SSI or /SSE Graphics Board in Slots D and A

1. Go to Chapter 1, pages 3-8, and follow the directions for powering off the workstation and attaching the wrist strap. Then go to Chapter 6, "Removing the XIO Module" on page 86, and follow the directions through removing the XIO module. Then return here and go to the next step.
2. Place protective caps on the XIO compression connectors on the graphics boards.
3. Turn the XIO module so that slots D and A (the OCTANE/SSI or /SSE, or OCTANE/MXI or /MXE graphics board) are facing you.



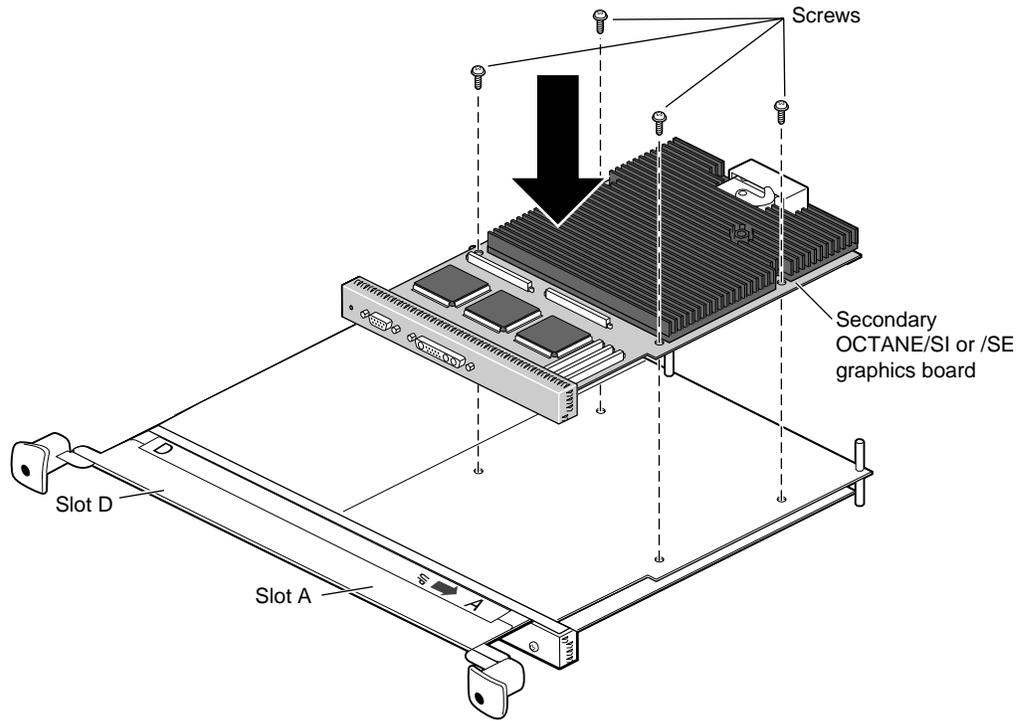
**Figure 10-5** Removing a Primary OCTANE/SSI or /SSE Graphics Board

4. Remove the six screws that hold the Primary OCTANE/SSI or /SSE, or OCTANE/MXI or /MXE graphics board to the XIO module.
5. Place the OCTANE/SSI or /SSE or OCTANE/MXI or /MXE graphics board on a clean, dry, antistatic surface. Your desktop works well.
6. Turn the XIO module so that the secondary OCTANE/SI or /SE graphics board faces you.



**Figure 10-6** Removing the Secondary OCTANE/SI or /SE Graphics Board

7. Remove the four screws that hold the secondary OCTANE/SI or /SE graphics board to the XIO module.
8. Place the secondary OCTANE/SI or /SE graphics board on a clean, dry, antistatic surface. Your desktop works well.
9. Place a blank panel in the slot from which you removed the secondary OCTANE/SI or /SE graphics board.
10. Insert and tighten the four screws that hold the blank panel to the XIO module.



**Figure 10-7** Placing the Secondary OCTANE/SI or /SE Graphics Board in Slot A

11. Place the secondary OCTANE/SI or /SE graphics board into slot A.
12. Replace the four screws.
13. Remove the compression connector cap.
14. Insert a blank panel into slot D (the one that also held the primary graphics board), using four screws to attach the blank panel to the XIO module.

**Caution:** Do not place the OCTANE/SSI or /SSE or OCTANE/MXI or /MXE graphics board in slots B and C.

15. Go to “Replacing the XIO Module” on page 102 and follow the directions for replacing the XIO module through powering on the workstation. Then go to “Checking and Diagnosing the Configuration” on page 141 to check and diagnose the configuration.

## Checking and Diagnosing the Configuration

**Table 10-4** Diagnostic Test Results: OCTANE/SSI or /SSE/SI or /SE, or OCTANE/MXI or /MXE/SI or /SE Configuration

Original State of Board in Slot A or Slots A and D	State of Secondary Graphics Board in the Primary Graphics Board Slot	Solution
1. The Primary head displayed a blank or faulty image.	The secondary head displayed a blank or faulty image.	Software problem; call your authorized service representative.
2. The Primary head worked properly.	The secondary head works properly.	Software problem; call your authorized service representative.
3. The primary head displayed a blank or faulty image.	The secondary head works properly.	Primary graphics board is faulty; call your authorized service representative.
4. The primary head worked properly.	The secondary head displays a blank or faulty image.	Secondary graphics board is faulty; call your authorized service representative.

## Returning the Graphics Boards to Their Original Positions

After performing this diagnostic test, return the graphics boards to their original positions. Follow the directions in this section.

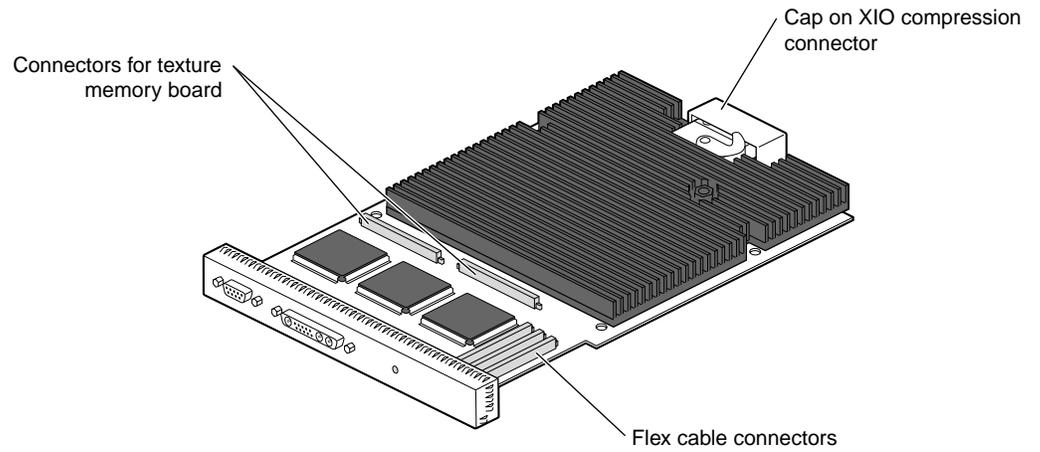
1. Go to Chapter 1 pages 3 - 8, and follow the directions for powering off the workstation and attaching the wrist strap. Then go to Chapter 6, "Removing the XIO Module" on page 86 and follow the directions through removing the XIO module. Then return here and go to step 2.
2. Place caps on the compression connectors.
3. Remove the secondary OCTANE/SI or /SE graphics board from slot A.
  - Remove the four screws holding the OCTANE/SI or /SE graphics board to the XIO module.
  - Lift the board off the XIO module and place it on a clean, dry, antistatic surface.
4. Remove the blank panel from slot D.

5. Place the OCTANE/SSI or /SSE or OCTANE/MXI or /MXE graphics board into slots D and A.
6. Insert and tighten the six screws that hold the board to the XIO module.
7. Find the blank panel that is a place holder for the secondary OCTANE/SI or /SE graphics board, and remove the four screws holding the blank panel to the XIO module.
8. Remove the blank panel from the slot into which you want to place the secondary OCTANE/SI or /SE graphics board.
  - Remove the four screws holding the blank panel to the XIO module.
  - Lift the blank panel off the XIO module.
9. Place the secondary OCTANE/SI or /SE graphics board in the empty slot.
10. Insert and tighten the four screws that attach the secondary OCTANE/SI or /SE graphics board to the XIO module.
11. Remove the caps from the compression connectors.
12. Go to “Replacing the XIO Module” on page 102 and follow the directions for replacing the XIO module through powering on the workstation. Then call your authorized service representative with the results of your diagnostic test.

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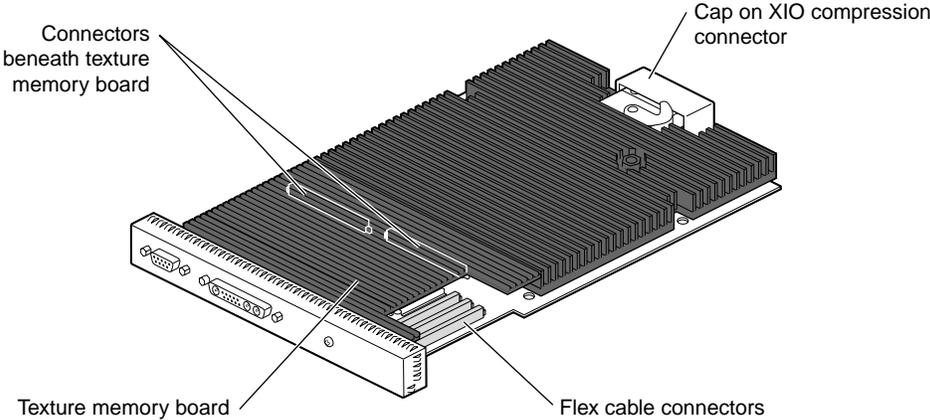
## Identifying Graphics Boards and the Ports and Modules on the Back of the Workstation

### OCTANE/SI or SE Graphics Board



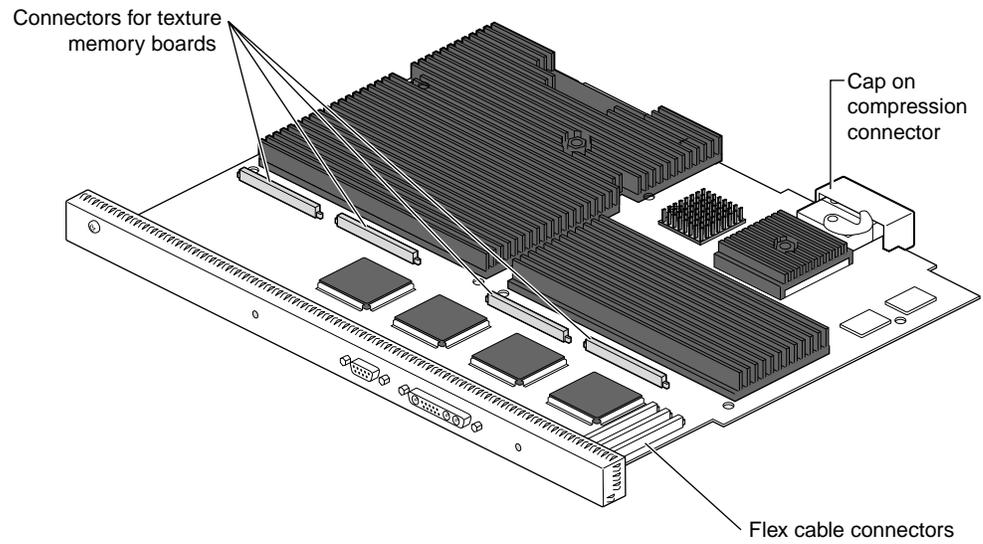
**Figure A-1** OCTANE/SI or /SE Graphics Board

### OCTANE/SI or SE With Texture Memory Option Board



**Figure A-2** OCTANE/SI or /SE With Texture Memory Option Board

## OCTANE/SSI or SSE Graphics Board



**Figure A-3** OCTANE/SSI or /SSE Graphics Board

### OCTANE/MXI or MXE Graphics Board

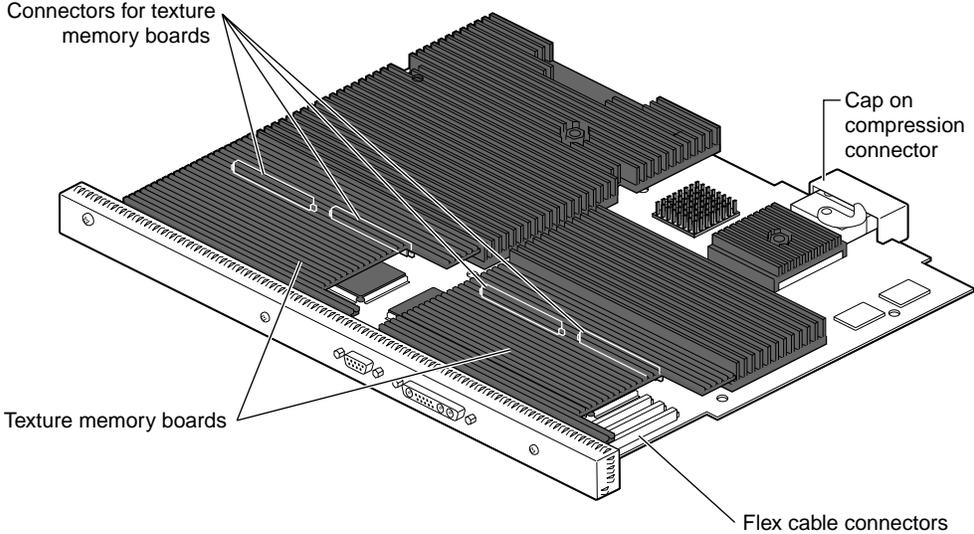
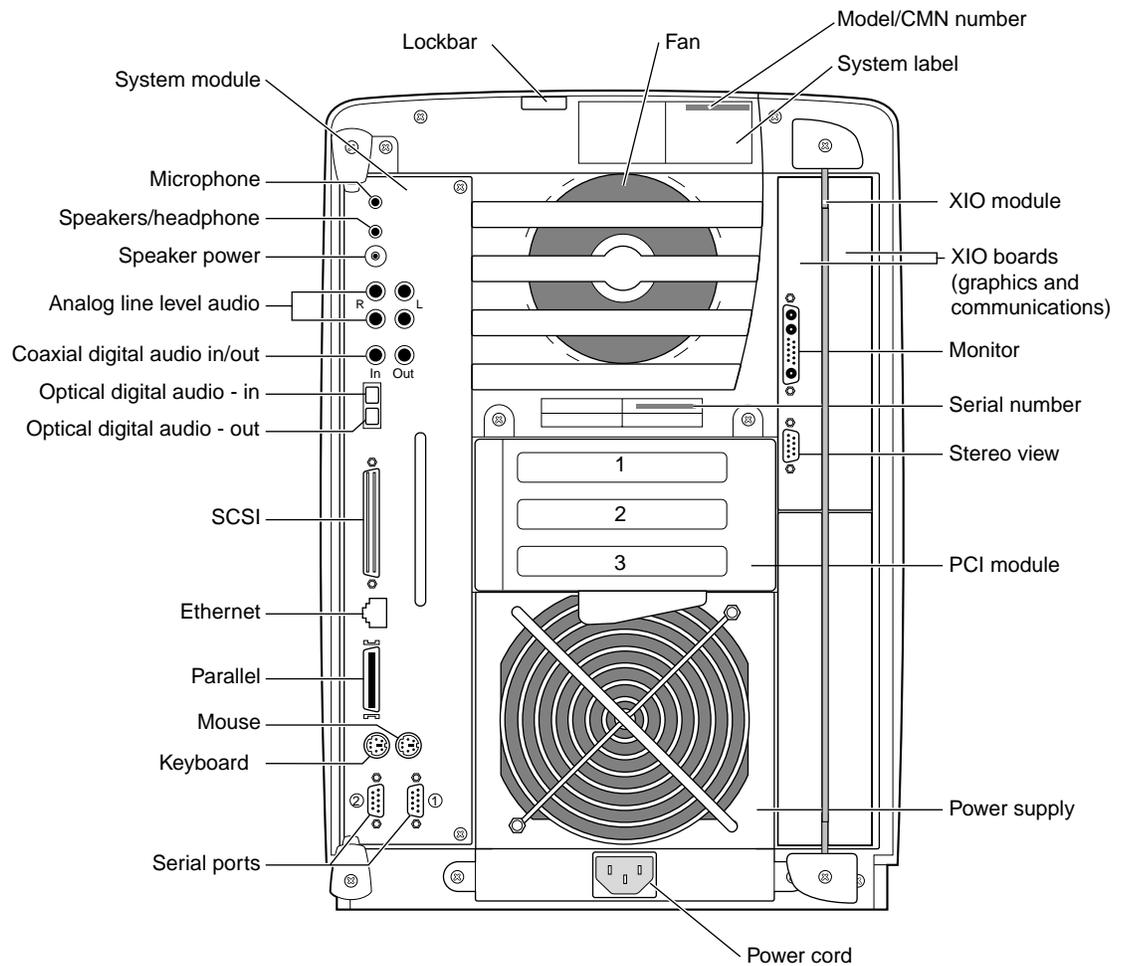


Figure A-4 OCTANE/MXI or /MXE Graphics Board

## Back of Workstation



**Figure A-5** Back of Workstation



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## Care and Cleaning of the Compression Connectors

The OCTANE workstation uses compression connectors to connect several modules and boards to the frontplane.

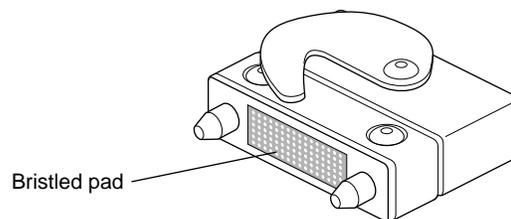
A single compression connector is used in the OCTANE workstation:

- on the back of the PCI module
- on each XIO board on the XIO module

Two compression connectors are used on the system module.

The compression connector has 96 pads that enable signals to pass between the system (via the frontplane) and the system module, PCI module, or XIO board.

The compression connector has two halves: One half is located on the frontplane of the chassis; the other, on the system module, PCI module, or XIO board. Each pad on a frontplane connector is a flat gold-plated surface. Each pad on the system module, PCI module, or XIO board is composed of hundreds of tiny bristles (dendrites). When a bristled pad is pressed into a gold-plated pad, a connection is created for one signal.



**Figure B-1** Identifying the Bristled Pad of the Compression Connector

The bristled pads may attract and hold dust, lint, grease, powder, and dirt. The presence of these substances clogs or damages the bristles and prevents them from making proper contact with the gold-plated pads on the system's frontplane. It is important to prevent this.

## Guidelines for Storing and Handling the Compression Connector

To avoid damaging a compression connector and to keep it in optimal working condition, follow these guidelines whenever the board is not installed.

**Caution:** Failure to follow these instructions can result in irreparable damage to the surface of the connector's pads, which may result in intermittent or complete failure of the product.

- Do not wipe or touch the pads of the compression connector with anything (no human fingers, no brushes, no cloth, no probes), except as specified in the cleaning instructions. The bristles might be damaged.
- Whenever the module or board is not in the chassis, put the protective cap over the compression connector and put the module or board in an antistatic bag. Make sure to close (fold over) the open end of the bag to minimize exposure to dust and atmospheric gases.
- Do not put anything (not even water) onto the pads, except as specified in the cleaning instructions.
- Before laying the board on a surface, make sure that the surface is free of dust, lint, powder, metal filings, oil, water, and so on.
- Do not blow dust, dirt, or powder anywhere near the board when it is not inside its protective bag.

## Guidelines for Cleaning the Compression Connector

A compression connector should never need to be cleaned if you keep the protective cover on whenever the module or board is not in the chassis. However, if the connector becomes dirty, follow the instructions below for removing pollutants.

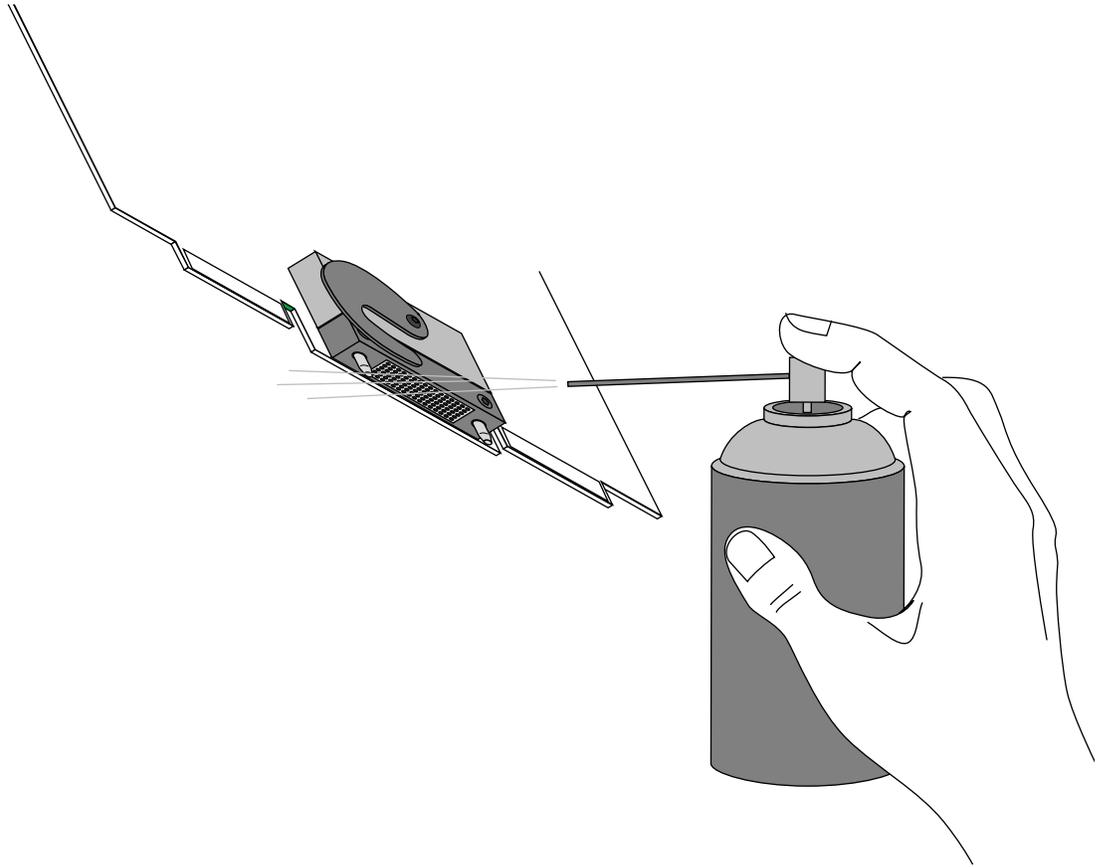
**Note:** Some pollutants can irreversibly damage (corrode or chemically alter) the pad surfaces. Although cleaning may remove the pollutant, it does not repair damage incurred by this contact.

To remove pollutants, follow these instructions:

1. Obtain a can of dry compressed air or inert gas. The Envi-ro-tech™ Duster 1671 product manufactured by TECHSPRAY (In the USA, telephone 806-372-8523) works extremely well for this application.

**Caution:** Do not use a cleaning product that contains any of the following ingredients: halogenated hydrocarbons, aromatic hydrocarbons, ethers, sulfur, ketones, or solvents of any kind. These substances cause irreparable damage to the connector's surface.

2. Prepare the can for use, as instructed on the can. For example, if a tube is provided, attach it to the can's dispensing mechanism.



**Figure B-2** Spraying the Compression Connector

3. Hold the can in a vertical position.
4. Place or hold the XIO board so that the rounded edge of the compression connector faces up. Note that the rounded edge is completely closed, so that air cannot flow into the connector, whereas the squared edge has an opening.  
**Caution:** Spraying into the squared (open) edge of the connector can destroy it.
5. Position the XIO board at an angle to the can, so that the tip of the can's applicator is 1 to 2 inches away from the first (topmost) row of pads. Do not allow the applicator to touch the pads. When you spray, the air hits each pad and flows downward.
6. Start spraying. As you spray, move the spray along the length of the connector until the entire length has been sprayed. Move down a few rows and again spray along the entire length.  
**Note:** Do not shake the can. Stop spraying if any visible material (for example, foam) appears. This foam will blow away once you resume spraying just air.
7. Repeat until all the pads have been sprayed.
8. When you finish, cover the compression connector with its cap or immediately install the board in an XIO slot.

---

## Programming Tips

This appendix provides a brief overview of library routines that developers may need in order to make applications work on a dual-head system. For more information about the routines mentioned, see the appropriate reference pages.

Note that once you open a window on a given head, the user can't move it to the other head via the window manager; if you want users to be able to move windows from one head to another, your program must explicitly close the old window and open a new one on the other head.

### Using Multiple Graphics Heads Under OpenGL, X, or Mixed-Model GL

X, mixed-model IRIS GL, and OpenGL all use X calls to choose on which screen to display: just pass the name of the desired display as the argument to **XOpenDisplay(3X11)**. (Pass NULL as the display name if you want to default to the value of the DISPLAY environment variable.) You can then call **RootWindow(3X11)** with the newly opened display, specifying whichever screen you want; then call **XCreateWindow(3X11)** to create a window on the specified screen. After that, use the usual OpenGL or X calls, as appropriate, to draw or display in the window.

This is the syntax for **XOpenDisplay()**:

```
Display *XOpenDisplay(display_name)
    char *display_name;
```

For example, to open a window on each head of a dual-head system:

```
#include <X11/Xlib.h>
#include <X11/Xutil.h>
#include <stdio.h>

void main(argc, argv)
int argc;
char **argv;
{
    Display *display;
    Window root0, root1, win0, win1;

    /* Open the display specified in the DISPLAY variable. */
    if ( (display = XOpenDisplay("")) == NULL )
        fprintf(stderr, "%s: cannot connect to X server.\n",
                argv[0]);

    /* Set up a root window for each screen. */
    root0 = RootWindow(display, 0);
    root1 = RootWindow(display, 1);

    /* Now create a window on each screen. */
    win0 = XCreateSimpleWindow(display, root0, 0, 0, 100,
                               100, 0, 0, 0);
    win1 = XCreateSimpleWindow(display, root1, 0, 0, 100,
                               100, 0, 0, 0);

    /* Display the windows and flush the output buffer. */
    XMapWindow(display, win0);
    XMapWindow(display, win1);
    XFlush(display);

    /* Leave them up for ten seconds before exiting. */
    sleep(10);
}
```

Note that if you are using the heterogeneous (SI or SE/SI or SE with texture memory option board or SI or SE/MXI or MXE) dual-head configuration, the SI or SE with texture memory option board or MXI or MXE head is always screen zero, while the SI or SE head is always screen one. Be careful about which head you choose if you don't decide to default to the value of DISPLAY. An MXI or MXE board runs 3D graphics and texture mapping much faster than does an SI or SE board.

## Using Multiple Heads Under IRIS GL

Under IRIS GL, select a head on which to run a window by using the **scrnselect(3G)** function. If you don't call **scrnselect()** before opening a window with **winopen(3G)**, the window opens on whichever screen the user has specified in the DISPLAY environment variable.

This is the syntax for **scrnselect()**:

```
long scrnselect (gsnr)
    long gsnr;
```

*gsnr* is the screen number relative to the current server—that is, zero for screen :0.0 or one for :1.0.

## Specifying Screen Adjacency

If you include system configuration files such as */usr/lib/X11/xdm/Xservers* with your application, you may want to configure the layout of the heads, specifying which is on the left and which on the right. For information on how to specify adjacency, see the Xsgi reference page, under the **-hw** option, or Chapter 4 in this guide.



## Cabling and Configuration Information for PCI Networking Boards

This appendix provides information to help you remove the *ioconfig.conf* file, and connect cables to the correct port on a particular PCI board. Configuration resources are provided in the last section of this appendix.

### About the *ioconfig.conf* File

The *ioconfig.conf* file records and saves option board and port information after the option board is installed in the OCTANE workstation. However, the file reserves the board and port spaces if the option board is removed, and assigns new logical controller numbers if the same type of board is inserted in a different PCI slot.

However, if you wish to have a listing of only what is currently installed, remove the *ioconfig.conf* file and restart your system. The file is rebuilt with information about the current hardware configuration reflecting what is currently installed.

**Note:** Rebuilding the *ioconfig.conf* file can change all of the maps between the logical controller numbers and the physical port locations, depending on whether option boards have been moved to different slots or removed from the system.

### Removing the *ioconfig.conf* File

If you need to place the PCI board (Ethernet/keyboard/mouse) in a different slot, move the board to the new slot, and then remove the *ioconfig.conf* file. Removing the file erases the memory of the previous location so that the system does not think two boards of the same type are installed. To remove the *ioconfig.conf* file, follow these directions:

1. From the Toolchest > Desktop, open a UNIX shell.
2. Become superuser.

3. Type: `rm /etc/ioconfig.conf`
4. Type: `exit` to exit superuser mode.
5. Restart the system. Restarting the system builds a new *ioconfig.conf* file.

## Mapping the Logical Controller Numbers to the Physical Port Locations

Before you can connect cables, you need to map the logical ports numbers to the physical port locations. Follow these instructions:

1. From the Toolchest > Desktop, open a UNIX shell.
2. At the prompt, type: `cat /etc/ioconfig.conf`
3. Read the following table, descriptions, and explanations to determine the correct port location(s) for the cables you wish to connect.

You see a listing similar to the following example.

**Table D-1** Identification of Information in the *ioconfig.conf* File

Logical Controller Number	Hardware	Node	Bus Type	Physical XIO Slot ID	Bus Type	Slot ID	Port Type (Abbreviation)	Serial Port ID
2	/hw	/node	/xtalk	/13	/pci	/2	/scsi_ctrl	
0	/hw	/node	/xtalk	/13	/pci	/1	/rns	
2	/hw	/node	/xtalk	/13	/pci	/3	/pckb	
2	/hw	/node	/xtalk	/13	/pci	/3	/pcms	
1	/hw	/node	/xtalk	/13	/pci	/3	/ef	

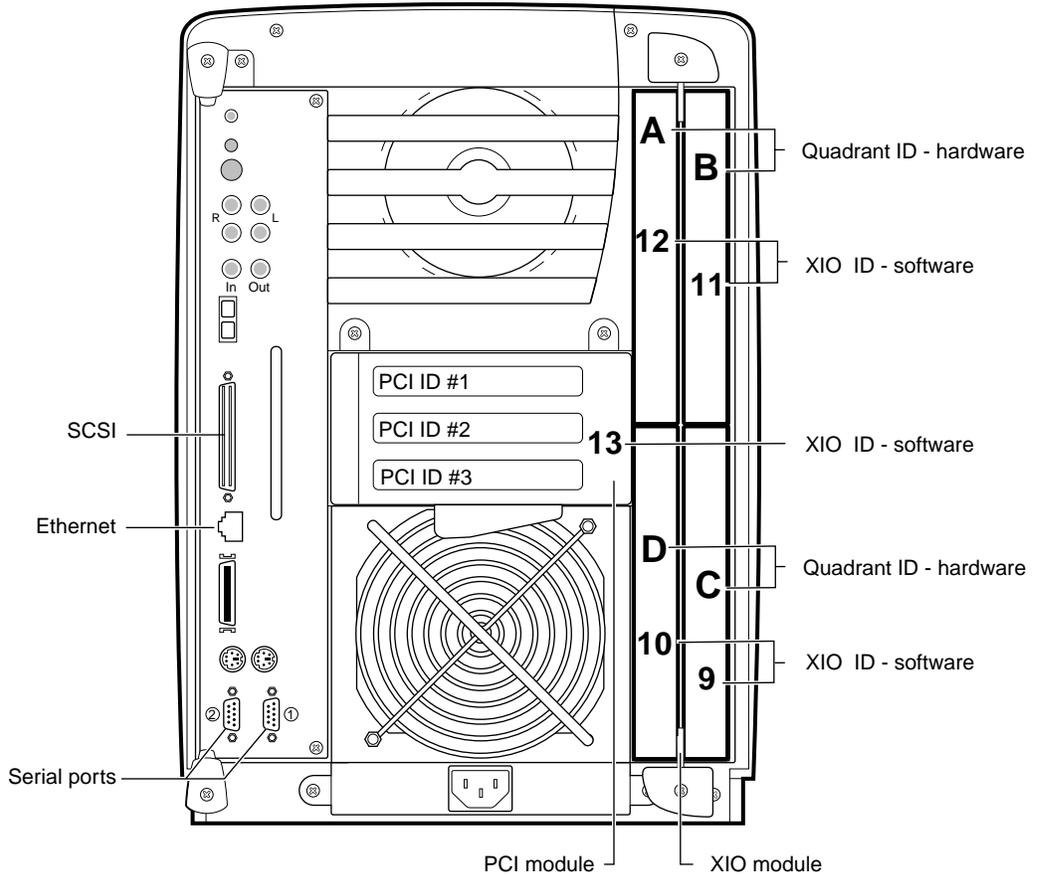
### **Logical Controller Number Column**

The Logical Controller Number is the number assigned to a port on an option board by the operating system. The logical controller numbers assigned by the operating system to a port on an option board always start higher than the last assigned port of the same type on the system module. Ports of the same type are assigned incrementing port numbers. For example, because there is one Ethernet port on the System module, the logical number 1 is assigned to the first optional Ethernet port that the software sees. (The Ethernet port on the system module is assigned logical number 0.)

### **Hardware, Node, and Bus Type Columns**

Ignore the Hardware, Node, and Bus Type columns containing XIO entries when looking for information in this table. They appear in the *ioconfig.conf* file to report that hardware is being probed, on one node, using XIO at one point and PCI at another within the workstation.

### Physical ID Column



**Figure D-1** Physical XIO Identification Numbers and Software Designations

Use Figure D-1 to determine the physical XIO ID number. The PCI module is the first XIO module probed. Its number is 13.

**Note:** Physical port numbers are assigned in descending XIO probing order. Example: a port on an Ethernet board in the PCI module (13) will be assigned logical number 1, before an Ethernet port in quadrant C (9) of the XIO module is assigned a logical number, because XIO ID 13 is probed before XIO ID 9.

### Bus Type Column

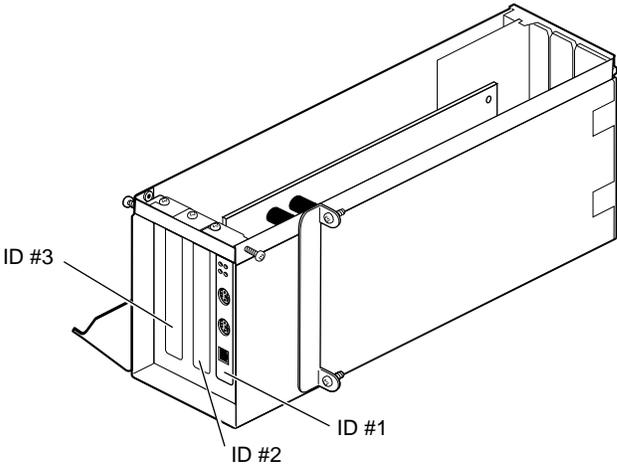
The column that contains PCI entries should be read only in conjunction with the Physical XIO Slot ID column that comes before it. If the Physical ID number is 13, the board, to which a logical controller number has been assigned, is in the PCI module.

### Slot ID and Port Type Columns

The Slot ID column refers to the physical location of the option board in the PCI module.

Logical controller number	Hardware	Node	Bus type	Physical XIO Slot ID	Bus type	Slot ID	Port type (abbreviation)	Serial port ID
2	/hw	/node	/xtalk	/13	/pci	/2	/scsi_ctrl	
0	/hw	/node	/xtalk	/13	/pci	/1	/rns	
2	/hw	/node	/xtalk	/13	/pci	/3	/pckb	
2	/hw	/node	/xtalk	/13	/pci	/3	/pcms	
1	/hw	/node	/xtalk	/13	/pci	/3	/ef	

The above example shows a PCI module with three boards installed. One of the boards has three ports: a keyboard port, a mouse port, and an Ethernet port. The physical XIO identification number is 13, meaning these are PCI boards. The slot identification number matches the PCI slot identification number in the PCI module. The board with three ports is in slot 3. Slot 1 contains an FDDI or CDDI board with one port. Slot 2 contains a board with a SCSI port.



**Figure D-2** PCI Module on its Side

**Serial Port ID Column**

Because each pair of XIO serial ports share a bus, this column identifies which XIO serial port is on which bus.

## Types of Ports

**Table D-2** Abbreviations and Definitions

Abbreviation	Definition
ef	Ethernet
rns	FDDI or CDDI
pckb	keyboard
pcms	mouse
tty	serial
scsi_ctrlr	SCSI controller

## After Installing the Board and Cables

When the board is installed and connected, and the OCTANE workstation is powered on, use the following information for configuration.

Certain PCI boards require some configuration, others do not. Use the table below to determine whether you need to configure the board.

**Table D-3** Determining Which Board to Configure

Configuration Needed	No Configuration Needed
All networking boards	Mouse, keyboard, SCSI, Radical

Refer to the *Personal System Administration Guide* or *IRIX Admin: Networking and Mail* guides for instructions on configuring software. Both documents are online and accessible from the Toolchest > Help > Online Books. The Personal System Administration Guide is under SGI End User, and the IRIX system administration guides are under SGI Admin.



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