

# OCTANE™ XIO Standalone Option Board Installation Guide

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St. Peter's Basilica image courtesy of ENEL SpA and InfoByte SpA. Disk Thrower image courtesy of Xavier Berenguer, Animatica.

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## Introduction

This guide tells you how to install standalone XIO boards in the OCTANE workstation, and provides necessary information about the XIO module and XIO graphics boards. A standalone XIO board is one that does not attach with flex cables to any other board.

See the online documentation that shipped with your system for any configuration and/or programming guides about the standalone XIO board. When looking for a configuration or programming guide, look for a title similar to that of the board protocol name.

Check the release notes for any other information.

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

### Additional Hardware Information

*OCTANE Hardware Central* – This online resource 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. It is found through the Toolchest > Selected > File QuickFind. When a window appears, type **insight**. When the InSight Bookshelf appears, choose SGI EndUser > *OCTANE Hardware Central*.

You can also open Netscape and in the location window, type **file:/usr/share/Insight/library/SGI\_bookshelves/SGI\_EndUser/books/Octane\_HWCnt1/index.html** to bring up *OCTANE Hardware Central*.

If this document is no longer installed on your system disk, see your *OCTANE Workstation Owner's Guide* for instructions on reinstalling this guide.

## 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 and Licensing Guide*. For system administration information, see the SGI\_Admin section of the online bookshelf.

## Product Support

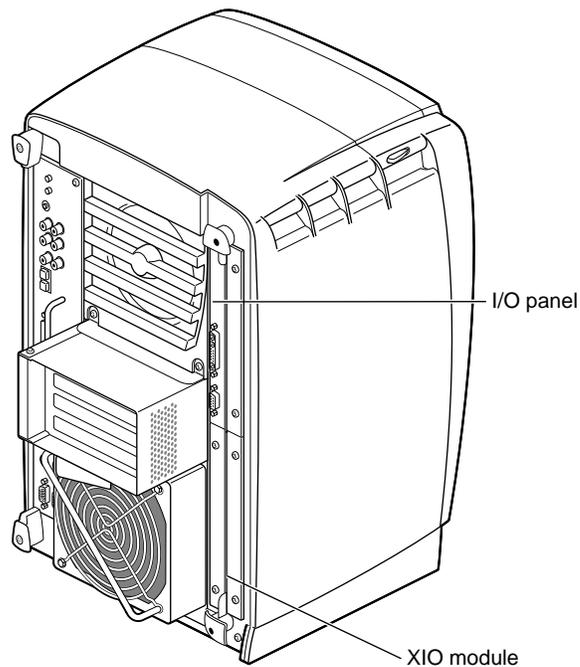
The OCTANE workstation is designed so that you can maintain and repair the workstation without the help of a trained technician. Contact your Silicon Graphics subsidiary or authorized distributor for information about product support.

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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## Installing a Standalone XIO Board

Several XIO graphics and option board configurations are possible in the OCTANE workstation. The boards attach to the XIO module, which slides out of the chassis for board installation.

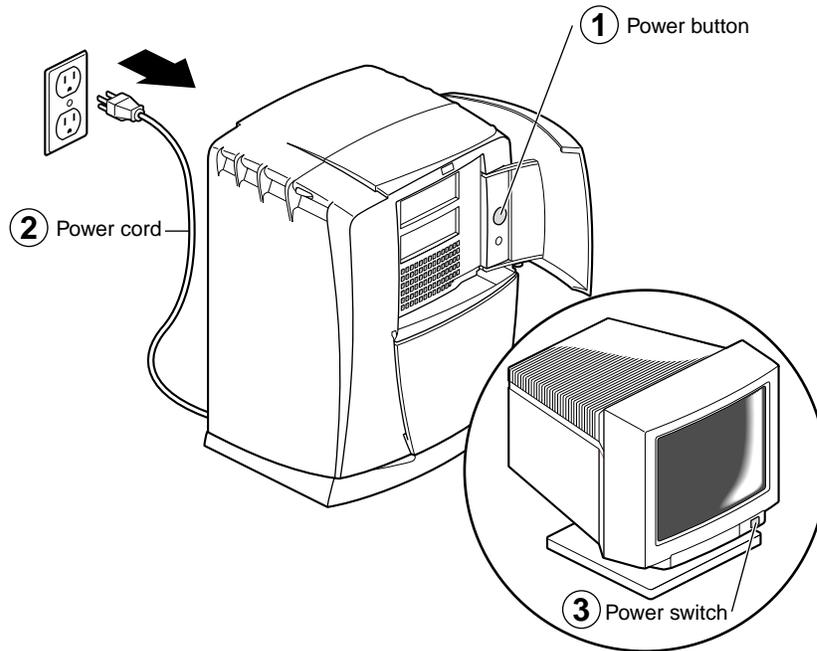


**Figure 2-1** Locating the XIO Module

The XIO module in the OCTANE workstation is on the right side as you face the back of the chassis.

Follow the steps in this chapter to install or remove a standalone XIO board.

## Preparing the Workstation to Install or Remove XIO Boards

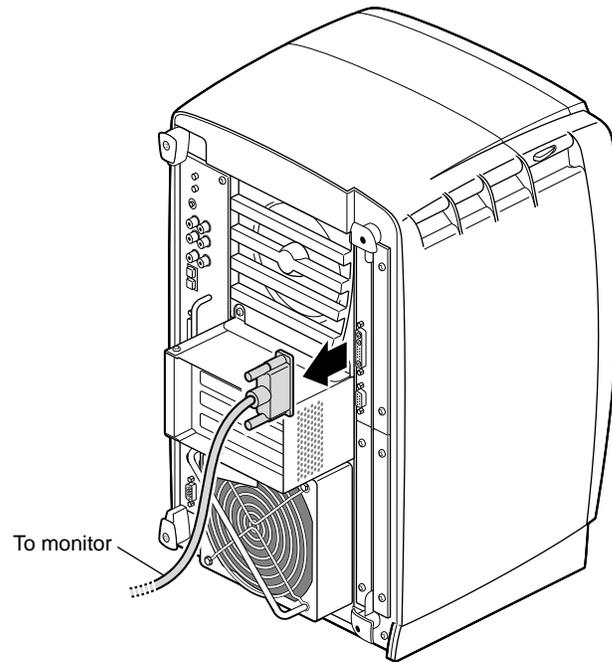


**Figure 2-2** Powering Off the OCTANE Workstation

1. Open the cover and push the power button to power off the OCTANE workstation.
2. Unplug the power cord.
3. Power off the monitor by pressing the power button.
4. Wait 5 minutes before removing the XIO module.



**Warning:** The heat sinks on the XIO boards become very hot. Wait 5 minutes after powering off the OCTANE workstation before you remove the XIO module. Test before touching any of the XIO boards.

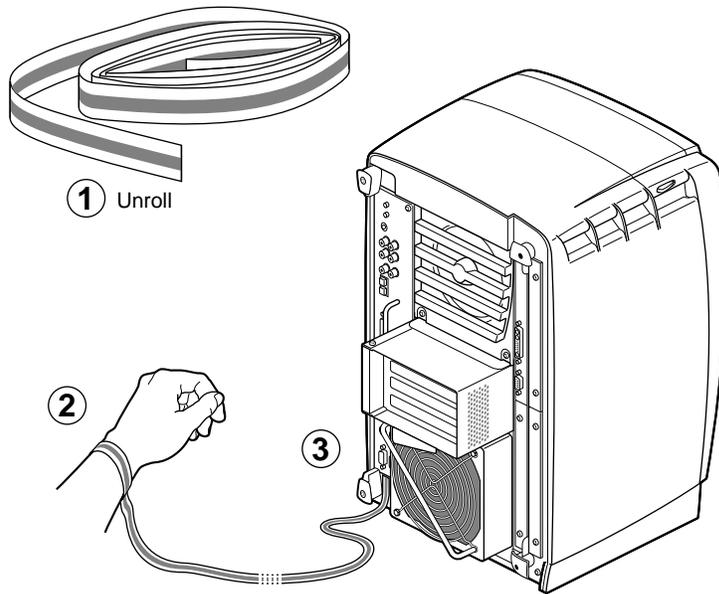


**Figure 2-3** Removing the Monitor Cable

5. Remove all the cables from the XIO module (only one is shown here).

### Attaching the Wrist Strap

To attach the wrist strap, follow these steps:



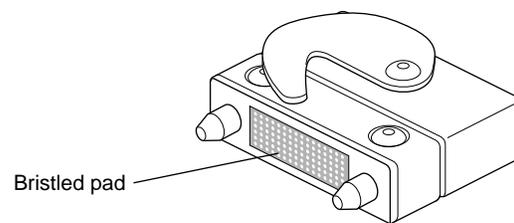
**Figure 2-4** Attaching the Wrist Strap

**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. Unwrap 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. Otherwise, use any convenient and exposed electrical ground, such as a metal part of the OCTANE workstation.

## Removing the XIO Module

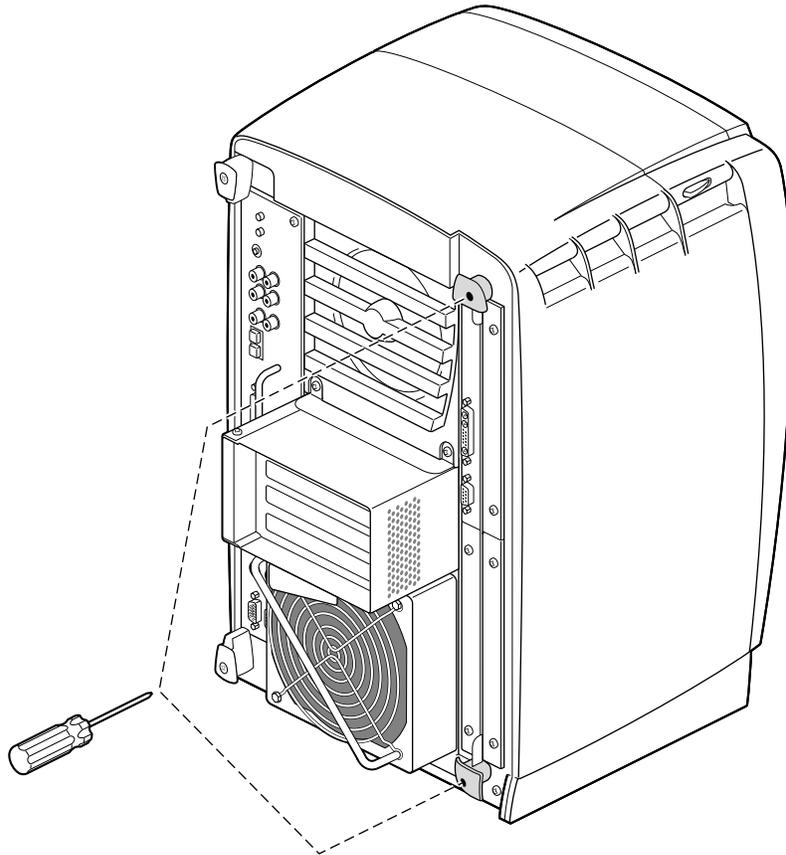
Before removing the XIO module, you must power off the OCTANE workstation, wait 5 minutes after powering off the workstation to allow the heat sinks to cool, and attach the wriststrap. If you have not already done this, go to “Preparing the Workstation to Install or Remove XIO Boards” on page 4 and follow the instructions through attaching the wriststrap. Then return here and follow the directions.



**Figure 2-5** Identifying the Compression Connector

When you remove the XIO module, the compression connectors on the back of the XIO module (XIO boards) are accessible and easily damaged. All XIO graphics boards have compression connectors, and most XIO option boards do.

**Caution:** The compression connectors on each XIO board are very delicate and easily damaged. Do not touch or bump the gold, bristled pad. Before you remove the XIO module, read Appendix B, “Care and Cleaning of the Compression Connector.”

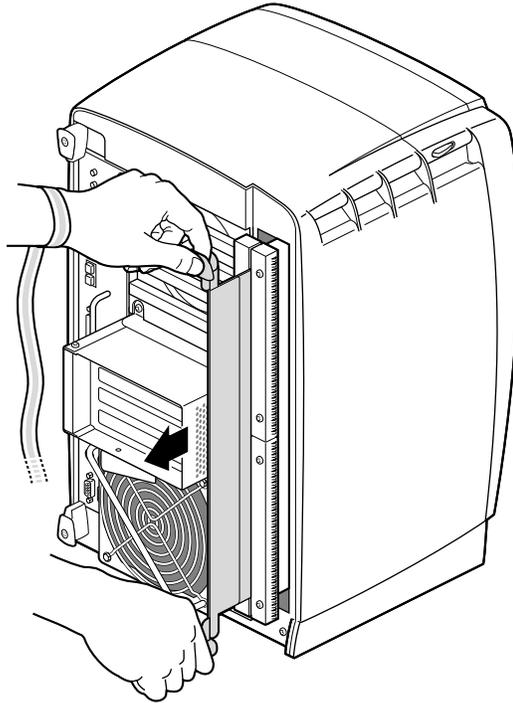


**Figure 2-6** Removing the XIO Module Screws



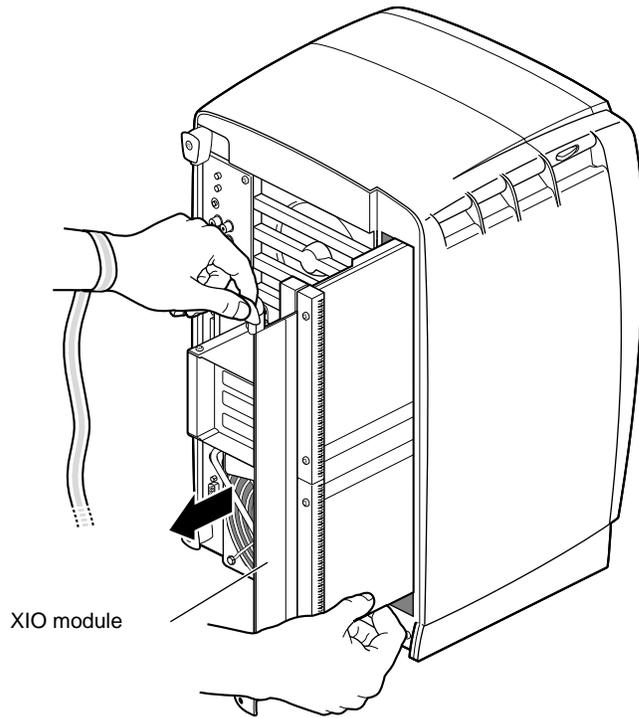
**Warning:** The heat sinks on the XIO boards become very hot. Wait 5 minutes after powering off the OCTANE workstation before you remove the XIO module. Test before touching any of the XIO boards.

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



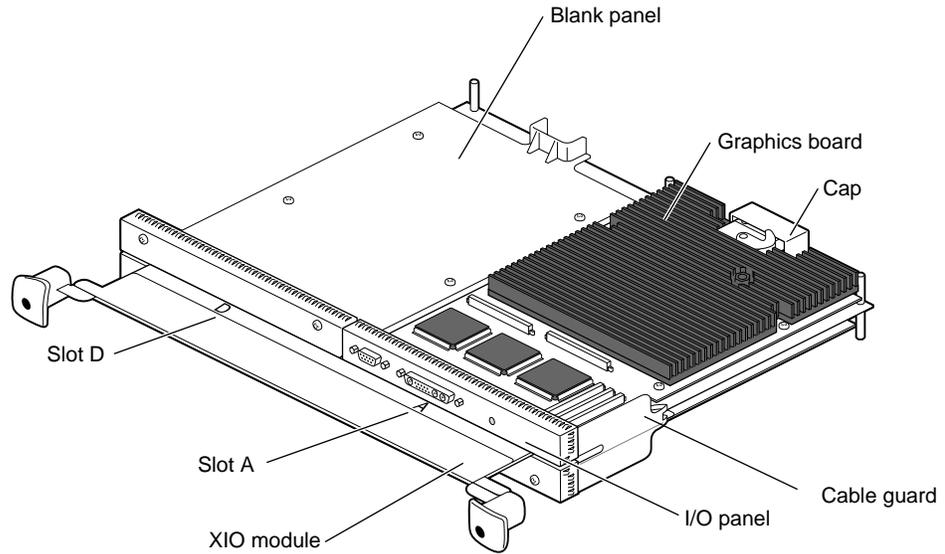
**Figure 2-7** Releasing the XIO Module

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. Continue to pull on the handles until the XIO module releases from the workstation.



**Figure 2-8** Removing the XIO Module

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



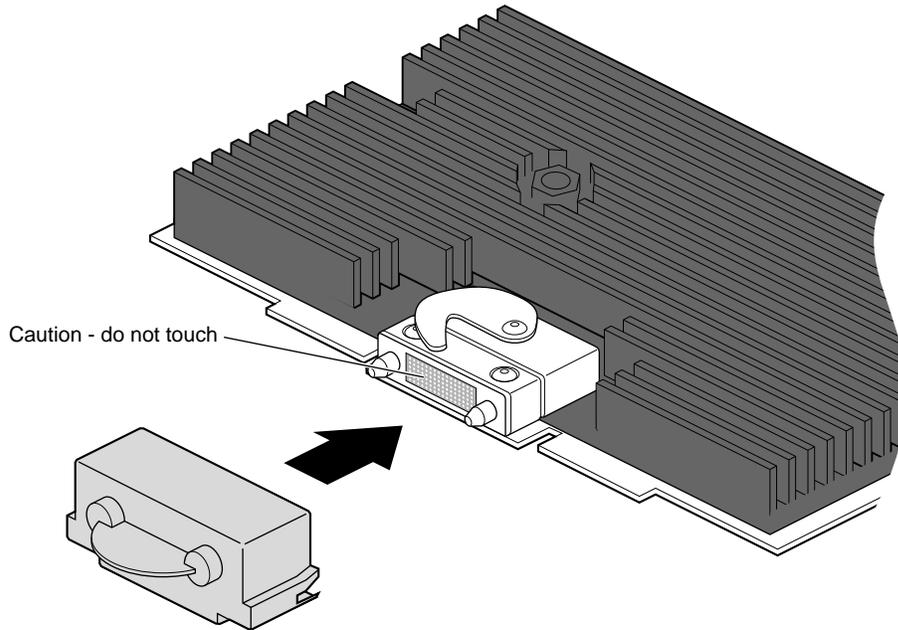
**Figure 2-9** Placing the XIO Module on Its Side

The handle area protrudes when the XIO module is out of the chassis. When the handle is in this position, the identification slots for the XIO boards D and A (shown) and B and C are visible. See Figure 2-9.

**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. Because slots B and C are on the reverse side of the XIO module from slots A and D, choose the slot in which you will place the XIO standalone board. Then turn the XIO module so that slot faces you.

**Note:** Protective compression connector caps come with the system. These caps are placed on any compression connector as soon as the XIO module is removed from the chassis, and then removed before placing the XIO module back in the chassis.



**Figure 2-10** Placing a Cap on the XIO Compression Connector

6. Place a cap on the XIO graphics board compression connector. Caps are part of the workstation shipment. See Figure 2-9.

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

## About the XIO Module and XIO Boards

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.

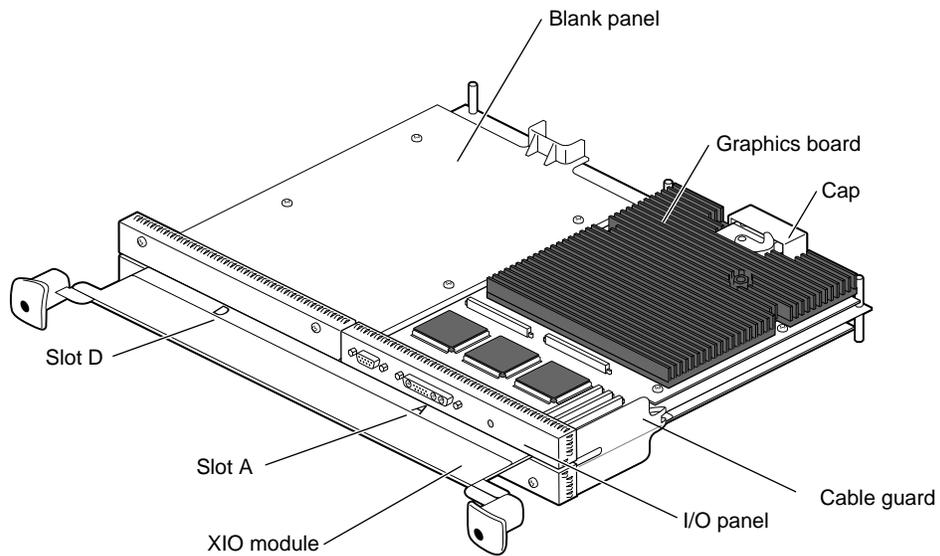
- The graphics board must be in slot A or slots A and D. (See the *OCTANE Dual Head Installation Guide* for specific locations of dual graphics boards.)
- The XIO graphics boards must be placed toward the interior of the workstation or they may overheat and be damaged.
- Option boards occupy slots B and C and possibly D.
- Graphics and option boards may be linked by flex cables.
- Protective blank panels must be placed in unused slots.
- Caps for the compression connectors ship with the workstation.
- A metal baffle must be in place on two blank panels that are side-by-side on the XIO module to ensure proper air flow.
- You may have a cable guard installed if previously a board was installed in slot B that connected to graphics in slot A. It is not needed for standalone boards. The ends of the cable guard should be under the edges of the I/O panels before the XIO module is inserted into the system.

## Removing an XIO Option Board or Blank Panel

Before removing a graphics board, option board, or blank panel, you must power off the OCTANE workstation, wait 5 minutes for the heat sinks to cool, attach a wriststrap, and remove the XIO module. If you have not already done so, see “Preparing the Workstation to Install or Remove XIO Boards” on page 4 and follow the instructions through removing the XIO module. Be sure to also read “About the XIO Module and XIO Boards” before beginning your task.

Before you install a graphics or option board, you need to remove a protective blank panel or other graphics or option board. The processes for removing a standalone graphics board or option board are the same. Removing a blank panel may require removing a baffle.

**Caution:** Do not touch 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 Connector."



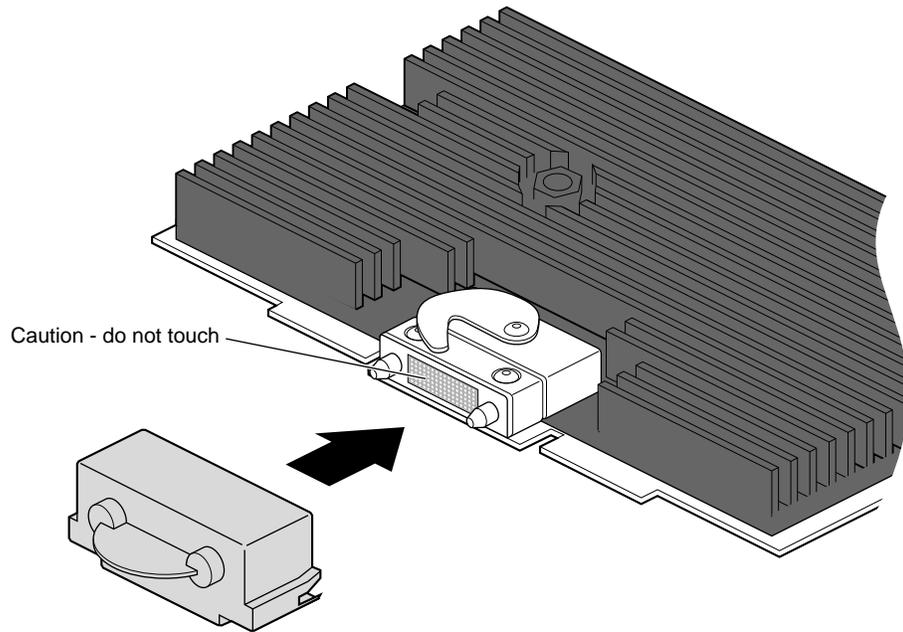
**Figure 2-11** Identifying the Slots Used by an XIO Board



**Warning:** The heat sinks on the XIO boards become very hot. Wait 5 minutes after powering off the OCTANE workstation before you remove the XIO module. Test before touching any of the XIO boards.

Graphics boards may be in one slot (A) or two (D and A). Figure 2-11 shows the OCTANE/SI graphics board in Slot A.

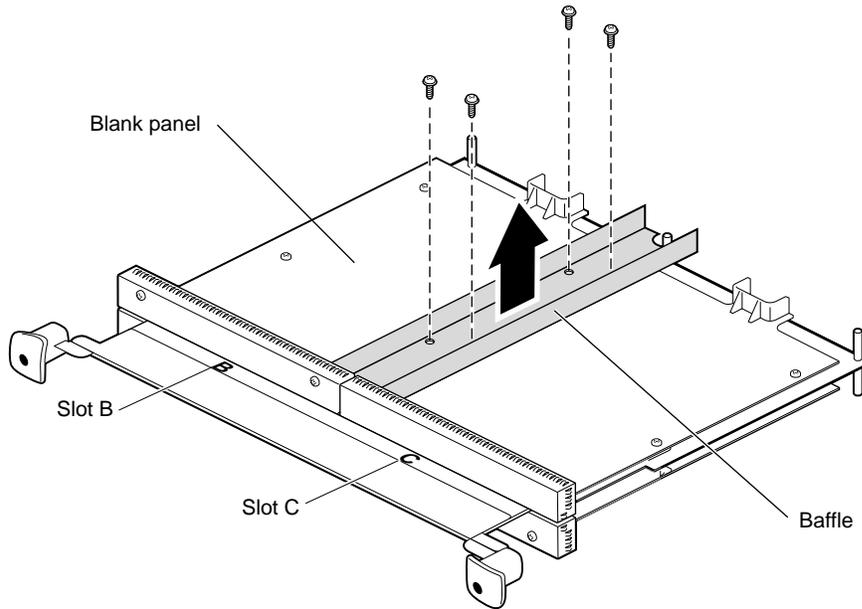
Install a standalone XIO board in any slot except that used by the graphics board. For illustration purposes in this manual, the standalone XIO board is installed in Slot C, on the opposite side of the XIO module from slots A and D.



**Figure 2-12** Placing the Cap on the XIO Compression Connector

**Caution:** Do not touch the gold surface of the XIO compression connector. Oil or dust damage this connector. If you need an XIO compression connector cap, check the workstation shipment.

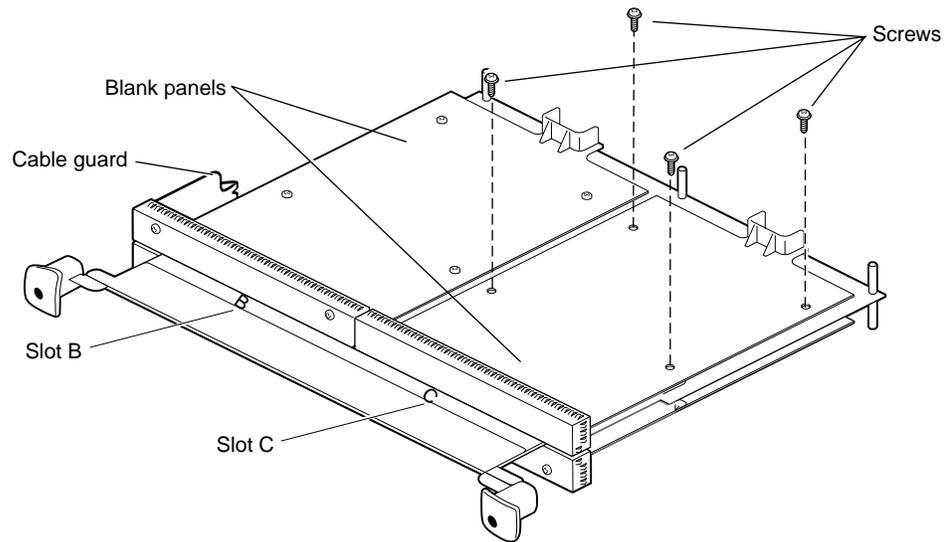
1. Place a cap (that comes with the workstation) on the XIO compression connector of the board you are removing to prevent accidental damage when removing the board.
2. If you need to remove flex cables connecting the graphic board to an option board, see the option board installation manual for instructions on removing and installing the flex cables.



**Figure 2-13** Removing the Baffle Attached to Two Blank Panels

If you are removing a blank panel that is next to an option or graphics board, skip to step 4. If you are removing a blank panel that is side-by-side with another blank panel, go to the next step.

3. Remove the baffle attached to two blank panels.
  - Remove the four screws holding the baffle to the blank panels, and remove the baffle. The baffle is only used 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.)
  - Remove the remaining screws from the blank panel you are removing.
  - Replace two screws in the blank panel that you are not removing.
  - Skip to step 5.



**Figure 2-14** Removing the Screws From the XIO Board

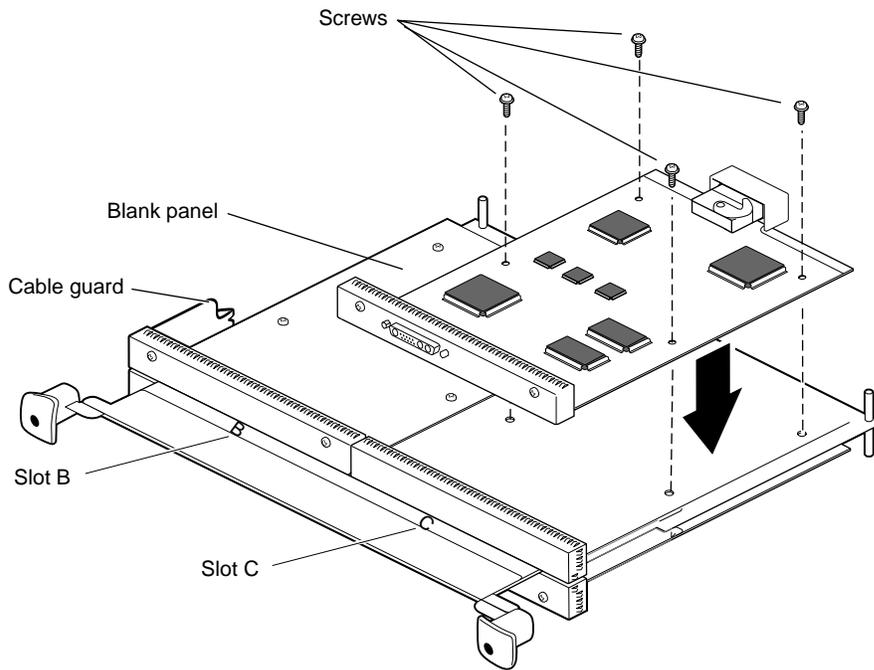
4. Using the supplied Phillips screwdriver, remove the screws from the blank panel or option board.
5. Grasp the blank panel or option board by the I/O panel and on the side of the board with no connectors and lift.
6. With the same side facing up, place the blank panel or option board on a clean, antistatic surface.

Save the blank panel to reinstall in the empty slot should you remove an option board.

Save the baffle to install on two side-by-side blank panels should you remove an option board. The baffle ensures proper air flow to the graphics boards.

Go to the next section to place an XIO option board on the XIO module.

### Placing a Standalone XIO Option Board on the XIO Module



**Figure 2-15** Installing the XIO Option Board

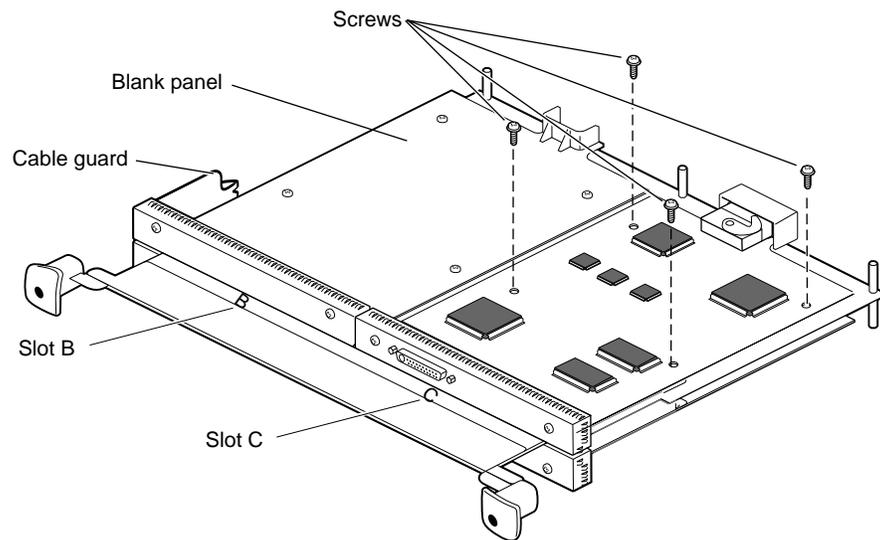
**Caution:** Do not remove the caps on the XIO compression connectors until the installation process is complete.

1. Determine which slot you will use to install the XIO option board or blank panel. The installation process for any slot is the same. Use any unused slot. For illustration purposes, Slot C is used in this installation example.

**Note:** Graphics boards must reside in slot A or slots A and D.

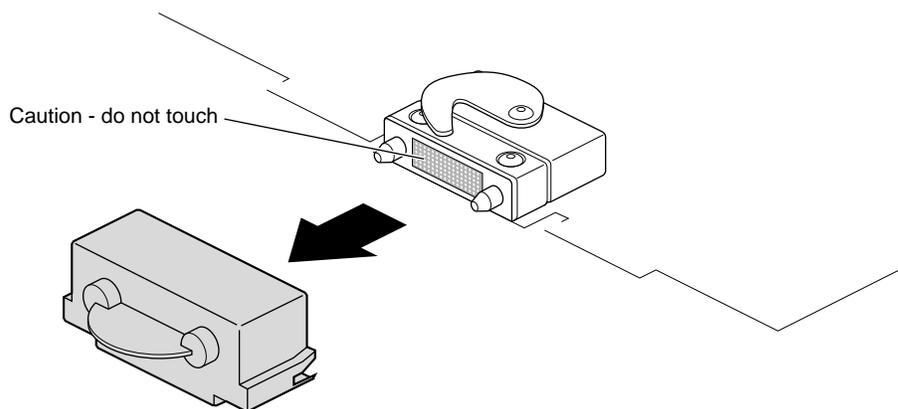
Orient the board so the thick side is up. The thick side has more depth from components, heat sinks, or daughter cards.

2. Place the XIO option board on the standoffs.



**Figure 2-16** Replacing the Screws

3. Replace the screws you removed earlier, tightening the XIO option board or panel to the standoffs. If you are installing a blank panel next to a blank panel, skip to step 5. 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.



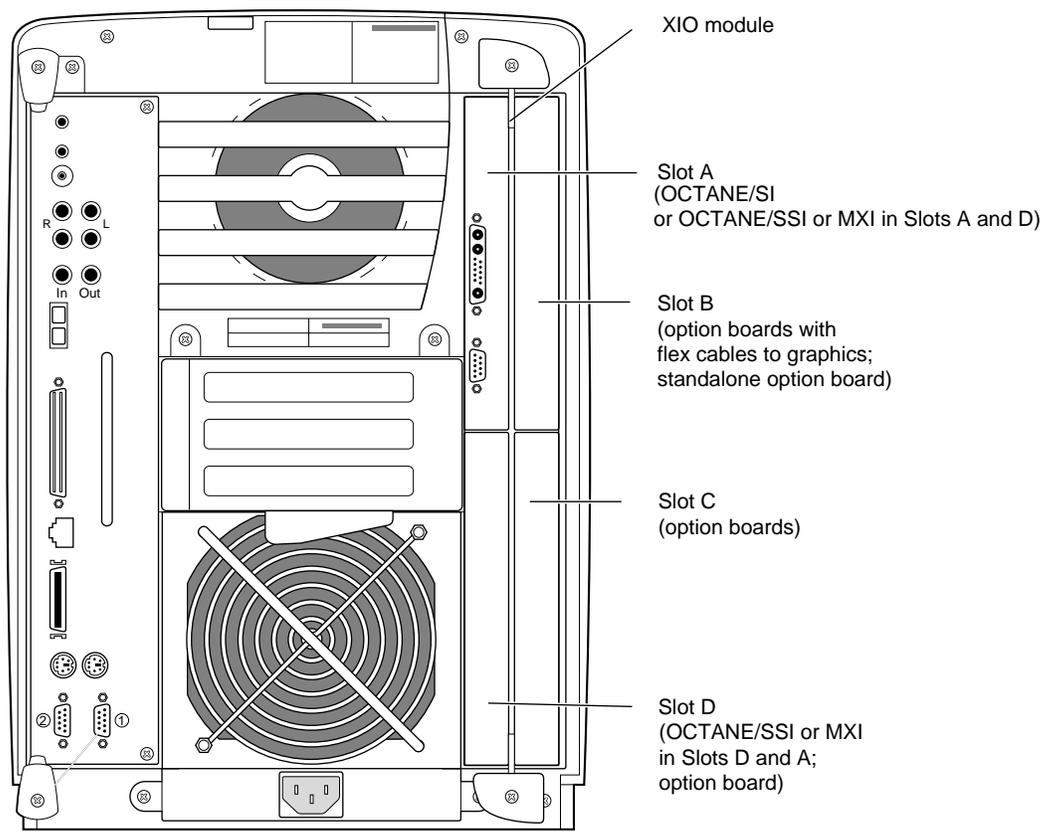
**Figure 2-17** Removing the Cap From the XIO Compression Connector

4. Remove the caps from all XIO compression connectors.

Keep the caps from the XIO compression connectors to place them on the XIO boards, the system module, or PCI module whenever you remove any part with a compression connector from the OCTANE workstation.

Go to the next section to replace the XIO module.

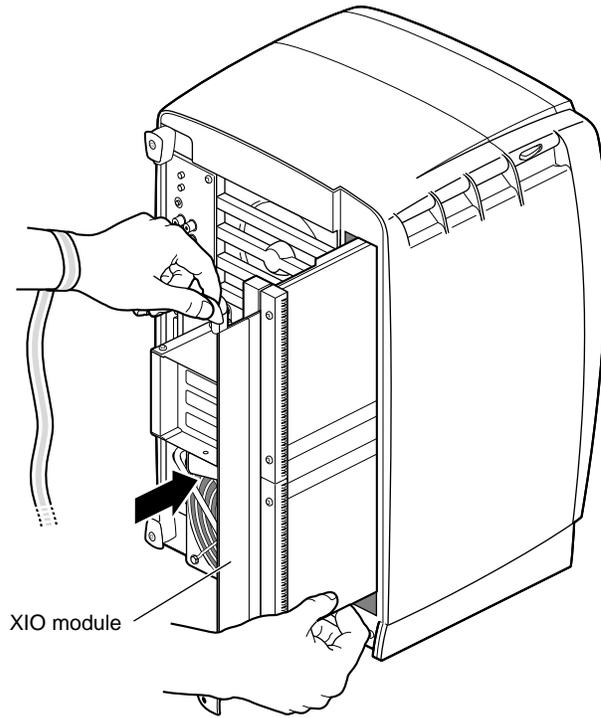
## Replacing the XIO Module



**Figure 2-18** Replacing the XIO Module With Slots A and D Toward the Interior of the OCTANE Workstation

**Caution:** Replace XIO module with the graphics boards toward the inside of the workstation, otherwise the boards may be damaged. If the XIO module is inserted with the OCTANE/SSI or OCTANE/MXI graphics boards toward the exterior of the workstation, a notifier appears during power on telling you to insert the XIO module with the graphics boards toward the interior of the workstation.

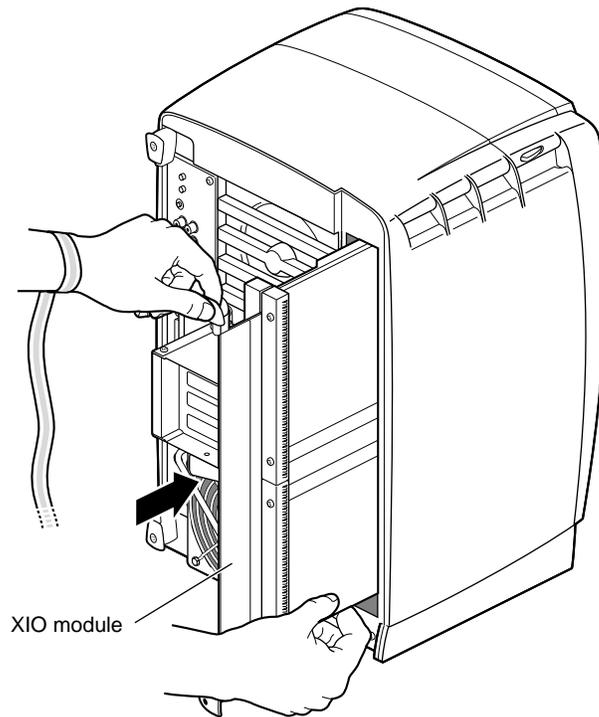
Follow the instructions on the following pages to replace the XIO module.



**Figure 2-19** Replacing the XIO Module

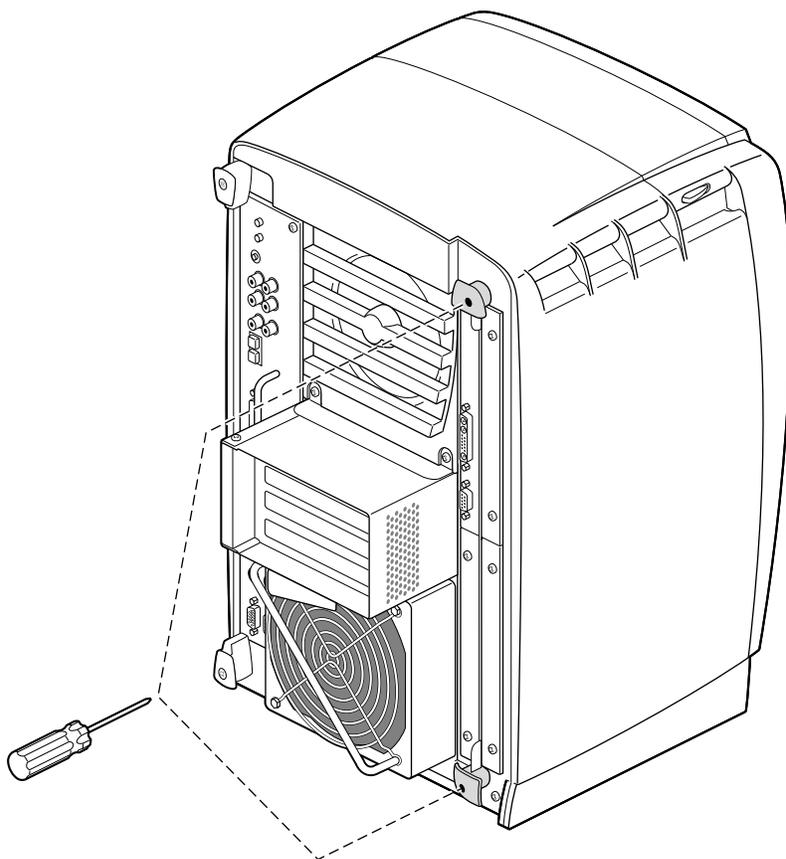
1. Slide the XIO module into guides on the top and bottom of the workstation, to replace the XIO module.
2. Before you insert the XIO module, make sure the handle portion protrudes in a locked position from the I/O panels, as shown in Figure 2-19.

If the handles are flush with the I/O panels, the XIO module stops during insertion. Pull out the handles until the handle portion of the XIO module looks like Figure 2-19.



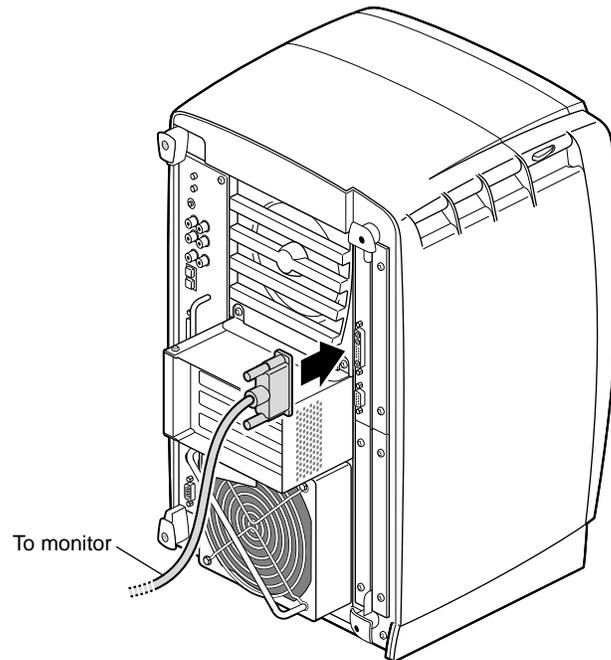
**Figure 2-20** Inserting the XIO Module

3. Grasp the handle area while supporting the XIO module, and slide the module into to the chassis.
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 is a slight variation in the depth of the boards.)



**Figure 2-21** Replacing the XIO Module Screws

5. Tighten the captive screws in the handles until the XIO module is attached to the workstation.
6. Remove the wrist strap.



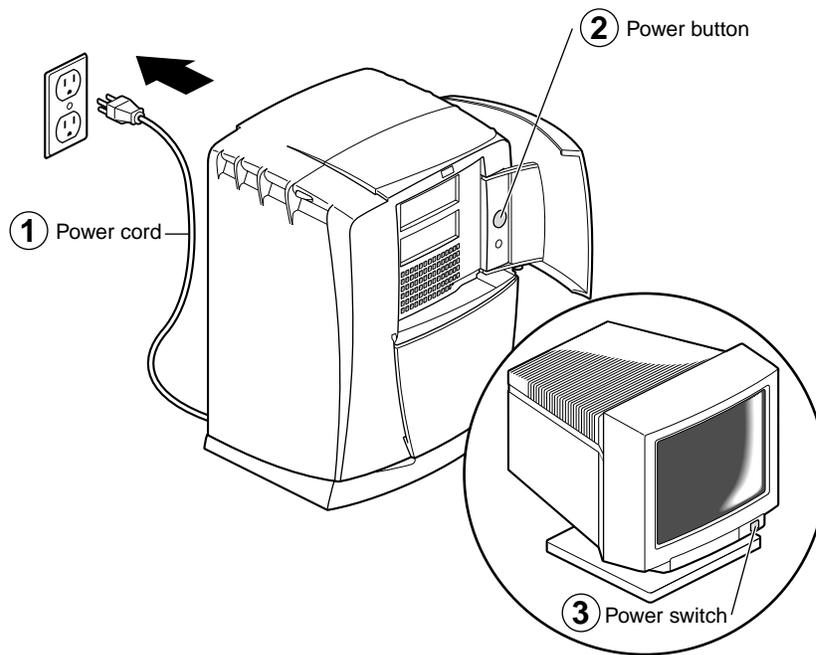
**Figure 2-22** Replacing the Monitor Cable

7. Reconnect all XIO cables to the XIO module.
8. Connect any new cables to the XIO module.

You have finished installing an XIO board.

Go to “Powering On the OCTANE Workstation” on page 26.

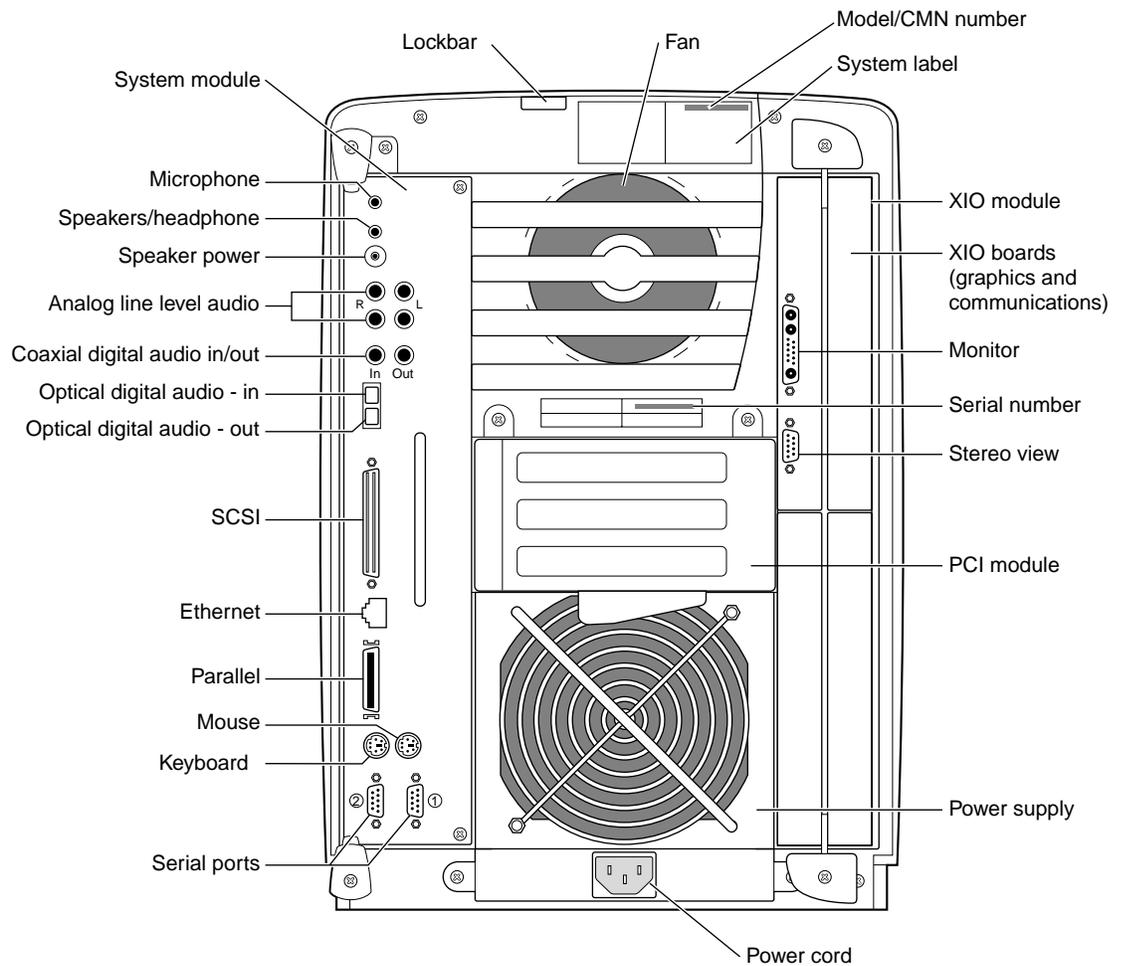
## Powering On the OCTANE Workstation



**Figure 2-23** Powering On the OCTANE Workstation

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

## Placing a Regulatory Label



**Figure 2-24** Rear View of the OCTANE Workstation

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 SISPR 22 information.

## Returning Parts

To return any part, use the packaging materials and box that came with your replacement part.

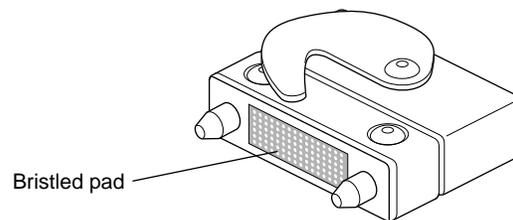
For product support information, see Chapter 1 of this guide.

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## Removing a Standalone XIO Board

Before removing a standalone XIO board, you must power off the OCTANE workstation, wait 5 minutes after powering off the workstation to allow the heat sinks to cool, attach the wriststrap and remove the XIO module.

Go to Chapter 2, “Preparing the Workstation to Install or Remove XIO Boards” on page 4 and follow the instructions through removing the XIO module. Then return here and follow these directions.



**Figure 3-1** Identifying the Compression Connector

When you remove the XIO module, the compression connectors on the back of the XIO module (XIO boards) are accessible and easily damaged. All XIO graphics boards have compression connectors, and most XIO option boards do.

**Caution:** The compression connectors on each XIO board are very delicate and easily damaged. Do not touch or bump the gold, bristled pad. Before you remove the XIO module, read Appendix B, “Care and Cleaning of the Compression Connector.”

## About the XIO Module and XIO Boards

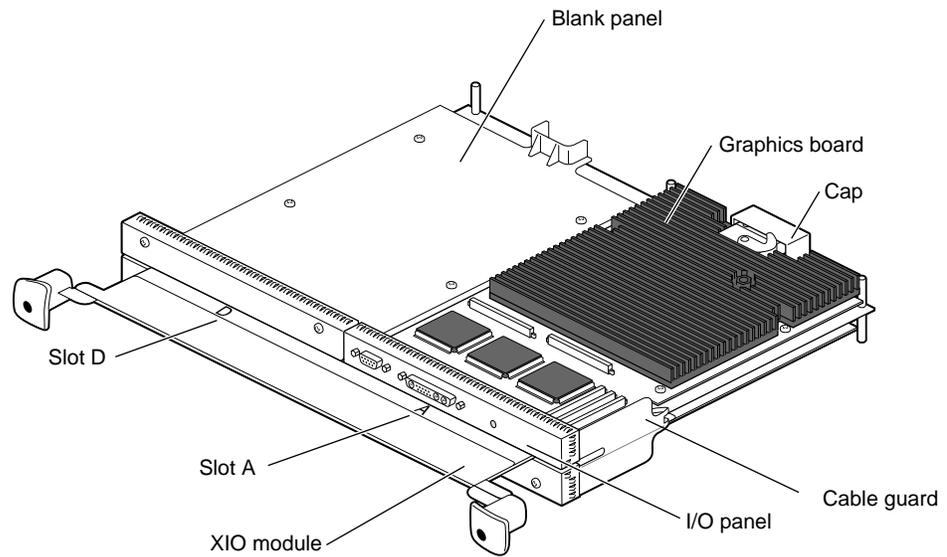
The four quadrants of the XIO module are Slots A, B, C, and D. Slots D and A are on one side, Slots B and C on the other.

- The graphics board must be in slot A or slots A and D. (See the *OCTANE Dual Head Installation Guide* for specific locations of dual graphics boards.)
- The XIO graphics boards must be placed toward the interior of the workstation or they may overheat and be damaged.
- Option boards occupy slots B and C and possibly D.
- Graphics and option boards may be linked by flex cables.
- Protective blank panels must be placed in unused slots.
- Caps for the compression connectors ship with the workstation.
- A metal baffle must be in place on two blank panels that are side-by-side on the XIO module to ensure proper air flow.

## Removing an XIO Option Board From the XIO Module

Before removing a graphics board, option board, or blank panel, you must power off the OCTANE workstation, wait 5 minutes for the heat sinks to cool, attach a wriststrap, and remove the XIO module. If you have not already done so, see Chapter 2, “Preparing the Workstation to Install or Remove XIO Boards” on page 4 and follow the instructions through removing the XIO module. Be sure to also read “About the XIO Module and XIO Boards” before beginning your task.

**Caution:** Do not touch 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 Connector.”

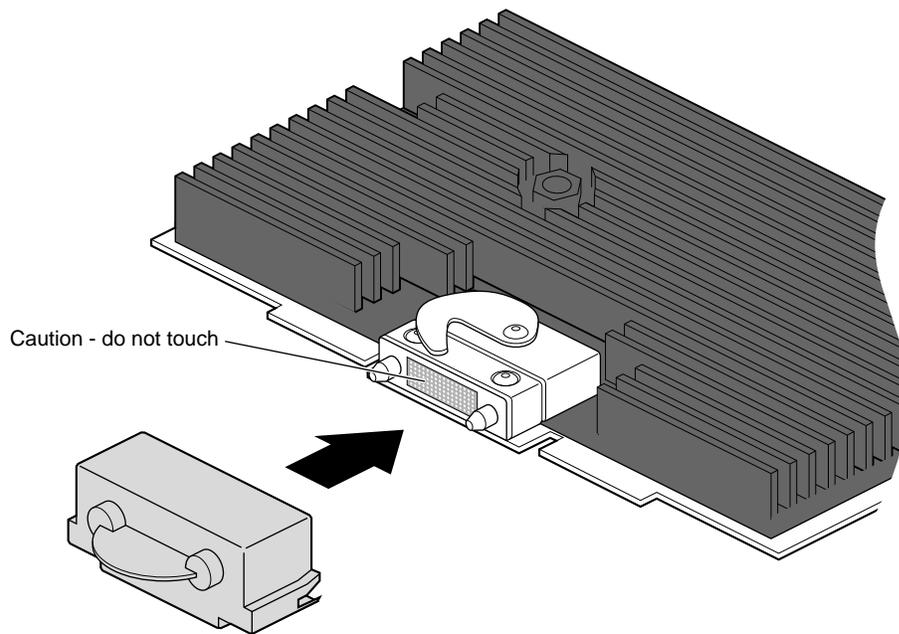


**Figure 3-2** Identifying the Slots Used by an XIO Board



**Warning:** The heat sinks on the XIO boards become very hot. Wait 5 minutes after powering off the OCTANE workstation before you remove the XIO module. Test before touching any of the XIO boards.

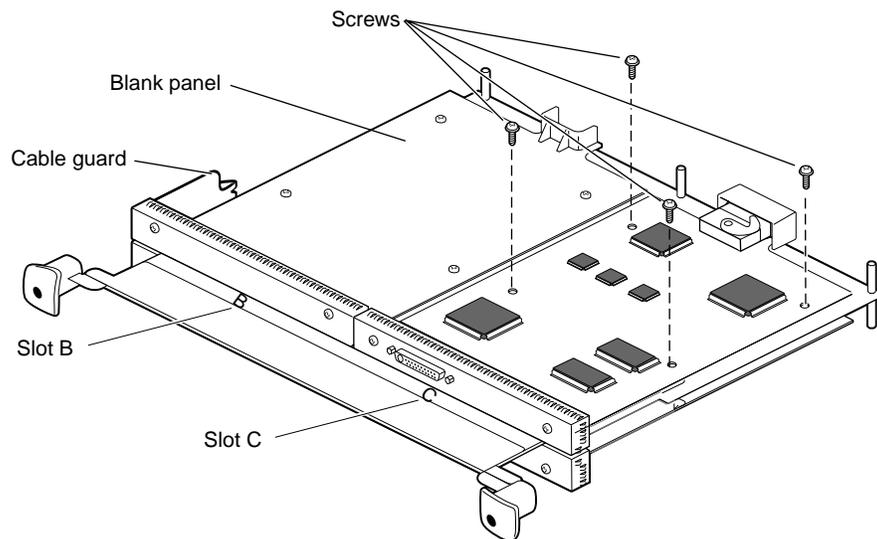
Graphics boards may be in one slot (A) or two (D and A). Figure 3-2 shows the OCTANE/SI graphics board in Slot A.



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

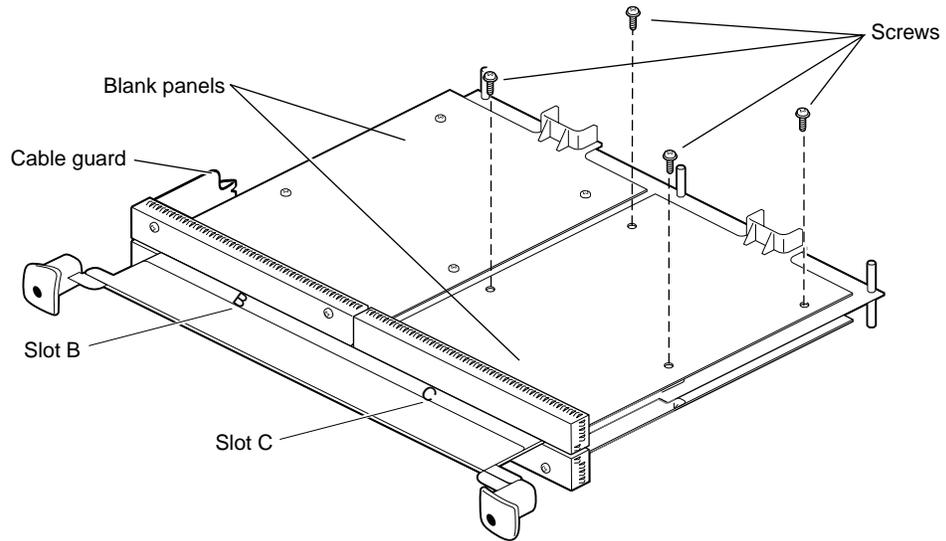
**Caution:** Do not touch the gold surface of the XIO compression connector. Oil or dust damage this connector. Caps are shipped with the workstation, and are for use on any compression connector. They are not needed on blank panels.

1. Place a plastic cap on the XIO compression connector of the board you are removing to prevent accidental damage when removing the board.



**Figure 3-4** Removing the Screws From the XIO Board

2. Using the supplied Phillips screwdriver, remove the screws from the XIO option board.
3. Grasp the XIO option board by the I/O panel and on the side of the board with no connectors and lift.
4. With the same side facing up, place the XIO option board on a clean, antistatic surface.

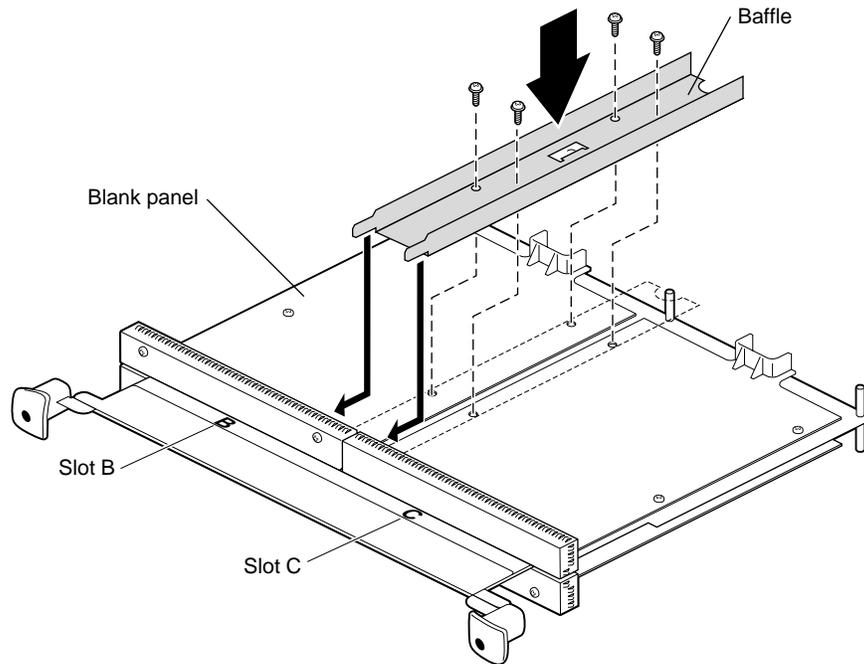


**Figure 3-5** Installing a Blank Panel

5. Place a blank panel on the standoffs on the XIO module.
6. Using the same screws, tighten the blank panel to the standoffs. If you are installing a blank panel next to a blank panel, go to step 8. Otherwise, go to step 7.
7. 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.

You are finished removing the XIO standalone option board.

Go to Chapter 2, “Replacing the XIO Module” on page 21 and follow the instructions through powering on the OCTANE workstation.



**Figure 3-6** Installing the Baffle

8. Install the baffle only across two side-by-side blank panels.
  - Place the blank panel you are installing on the standoffs and replace the two screws near the edge of the XIO module.
  - Remove the two inner screws from the blank panel already in place.
  - 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.

You are finished removing an XIO standalone option board.

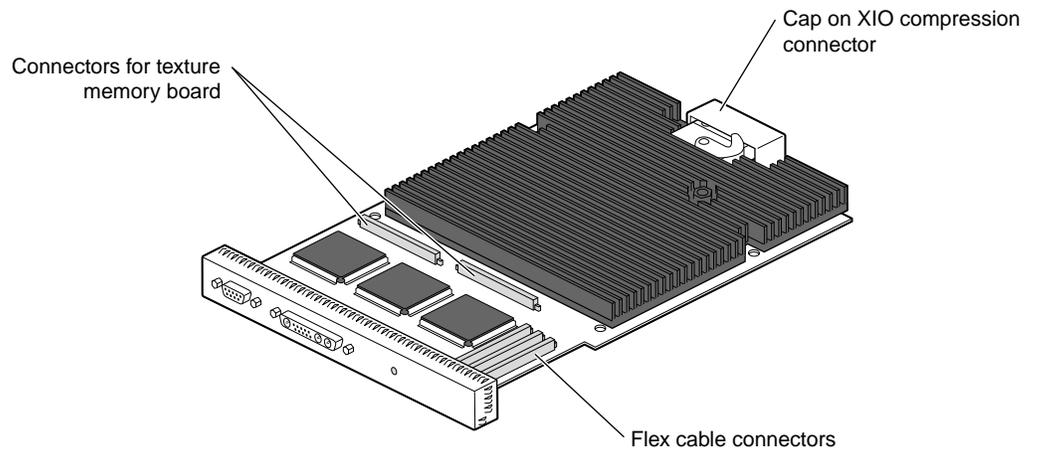
Go to Chapter 2, “Replacing the XIO Module” on page 21 and follow the instructions through powering on the OCTANE workstation.



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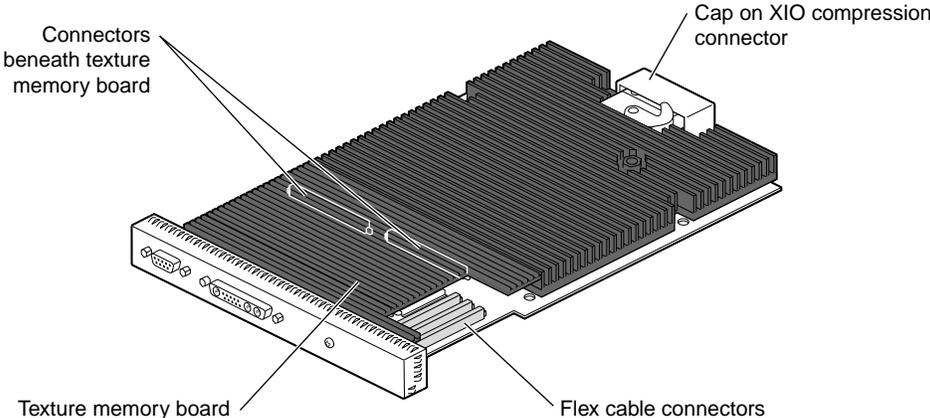
## Identifying Graphics Boards

### OCTANE/SI Graphics Board



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

### OCTANE/SI With Texture Memory Option Board



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

OCTANE/SSI Graphics Board

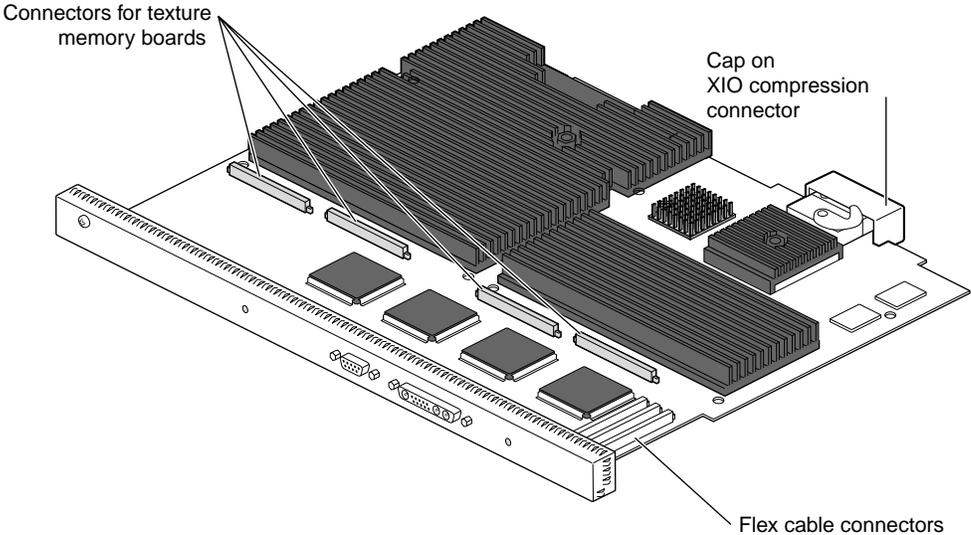


Figure A-3 OCTANE/SSI Graphics Board

### OCTANE/MXI Graphics Board

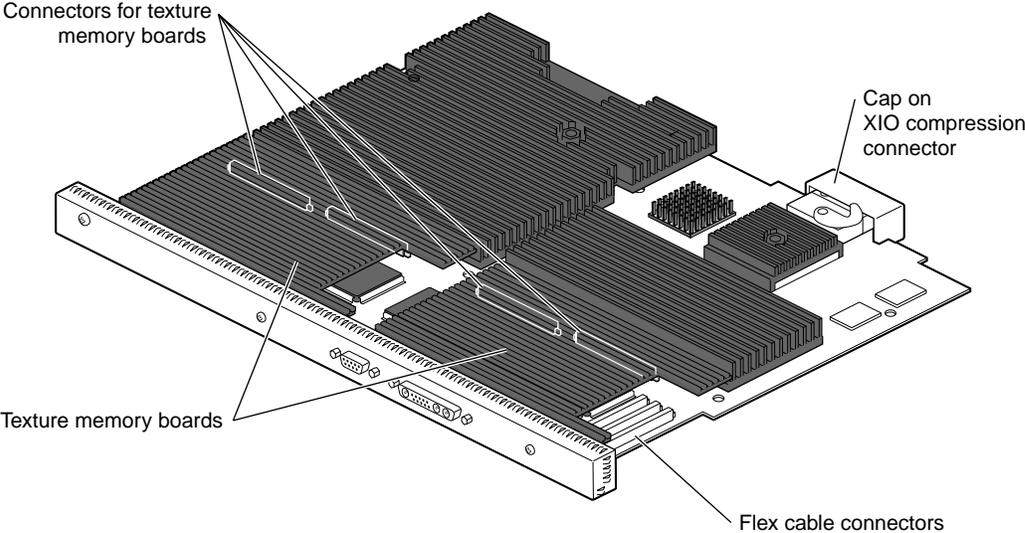


Figure A-4 OCTANE/MXI Graphics Board

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## Care and Cleaning of the Compression Connector

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

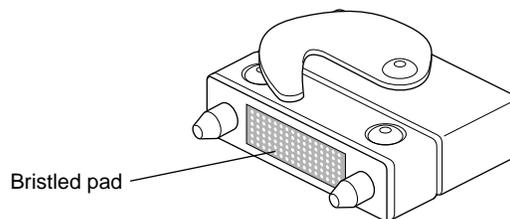
A single compression connector is used in the OCTANE workstation:

- 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 passage of signals 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 inert gas (for example, 100 percent pure nitrogen).  
**Caution:** Do not use a cleaning product that contains any of the following ingredients: halogenated hydrocarbons, aromatic hydrocarbons, ethers, sulphur, 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 provided, attach the tube to the can's dispensing mechanism.
3. Hold the can so that the tip of the applicator is one to two inches away from the first row of pads at the topmost edge of the connector and at a slight angle so that the spray hits each pad and flows downward. You will be spraying at the pads on one row, but in the direction of the next row of pads. Do not allow the applicator to touch the pads.
4. Start spraying. As you spray, move the spray along the side of the connector until the entire first row has been sprayed. Move down to the next row.
5. Repeat until all the rows have been sprayed.



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