OCTANE™ Dual Head
Installation Guide with Developer Notes

Document Number 007-3531-002

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

For regulatory and compliance information, see your *OCTANE Workstation Owner's Guide*.

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Introduction

This guide tells you how to install the Dual Head graphics upgrade in the OCTANE™ workstation. It also includes information on using the Dual Head system, troubleshooting, and programming notes for developers. 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 installation instructions for the OCTANE/SI graphics board as well as information about the XIO module and graphics boards.
- Chapter 2 provides information about removing the OCTANE/SI graphics board.
- Chapter 3 provides information about connecting the monitors.
- Chapter 4 provides information about installing the software and using the dual head system.
- Chapter 5 provides troubleshooting information.
- Appendix A provides information about choosing a graphics head.
- Appendix B provides information about the care and cleaning of the compression connectors.
- Appendix C provides illustrations of OCTANE XIO graphics boards and the back of the workstation.

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 the window appears, type **`insight`**. When the InSight bookshelf appears, choose *OCTANE Hardware Central* from the SGI EndUser 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`**

OCTANE Hardware Movies - Watch 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 type: **`http://techpubs.sgi.com/library/`**

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.

Chapter 1

Installing an OCTANE/SI Graphics Board

This chapter tells you how to install the OCTANE/SI graphics board in the OCTANE workstation with an existing OCTANE/SI, OCTANE/SI with texture memory option board, OCTANE/SSI, or OCTANE/MXI graphics board. The existing graphics board is the primary head. The OCTANE/SI board becomes the secondary head in a dual head configuration.

Check any release notes for software information.

About the Dual Head 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 slots 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. See Table 1-1 for supported configurations with the texture memory option board.

Table 1-1 Dual Head Supported Configurations

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

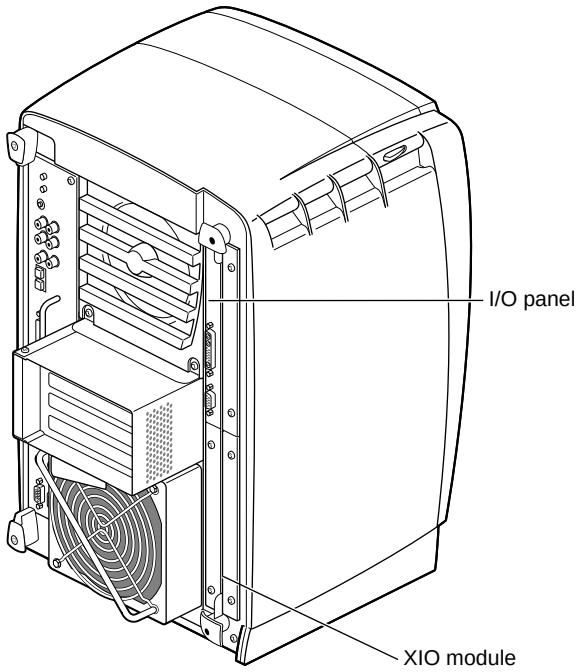

Figure 1-1 Locating the XIO Module

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 graphics board, beginning with the next section.

Preparing the Workstation to Install the OCTANE/SI Board

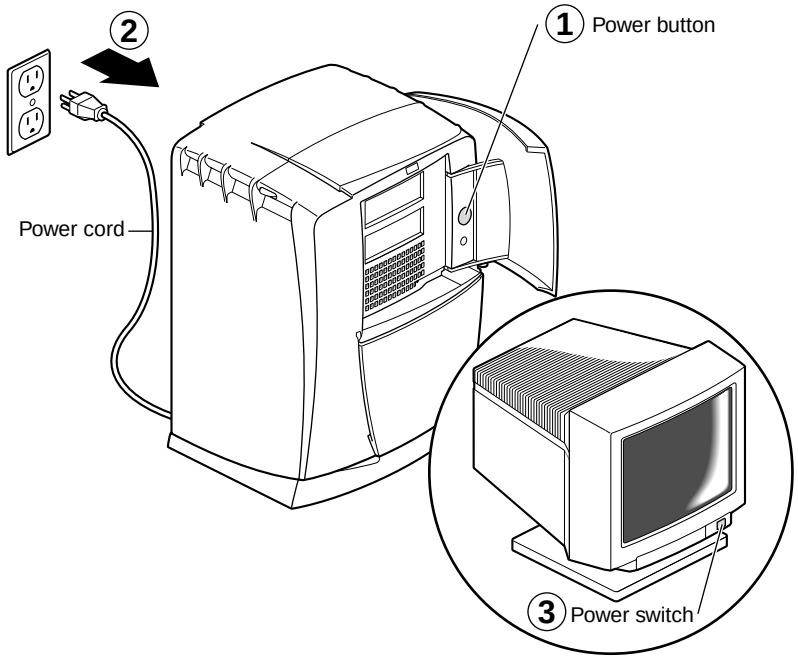

Figure 1-2 Powering Off the OCTANE Workstation

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 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.

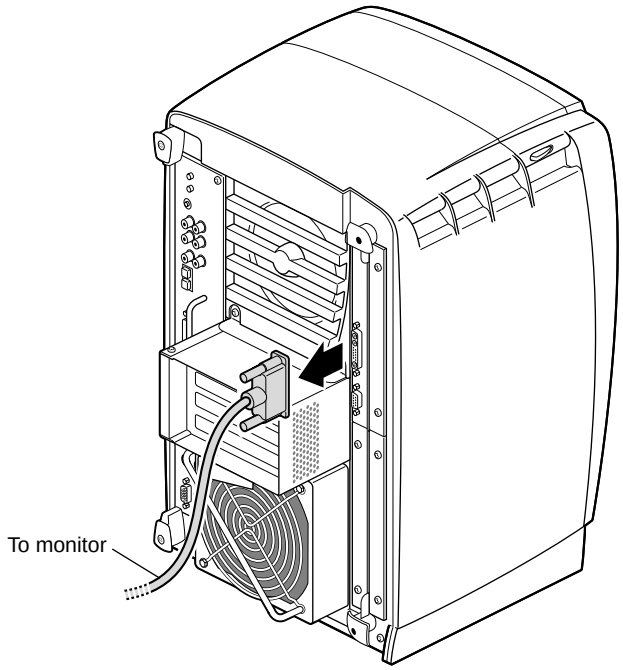

Figure 1-3 Removing the Monitor Cable

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

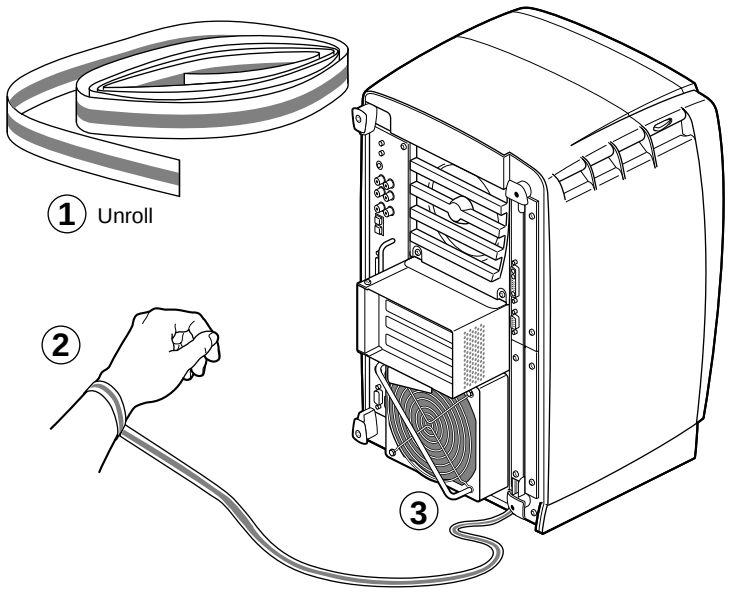

Figure 1-4 Attaching the Wrist Strap

To attach the wrist strap, follow these steps:

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.

6. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.
7. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.
8. 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 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 the OCTANE/SI Board" on page 3 and follow the instructions through attaching the wriststrap. Then return here and follow the directions.

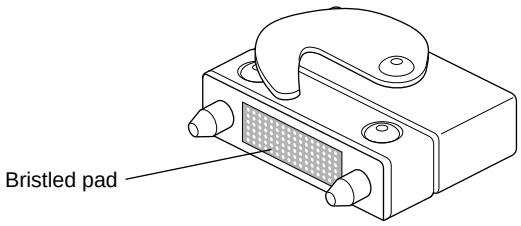

Figure 1-5 Identifying the Compression Connector

Caution: When you remove the XIO module, the compression connectors on the back of the XIO boards are accessible and easily damaged. Do not touch or bump the bristled pad. All XIO graphics boards have compression connectors, as do most XIO option boards. Before you remove the XIO module, read Appendix B, "Care and Cleaning of the Compression Connectors."

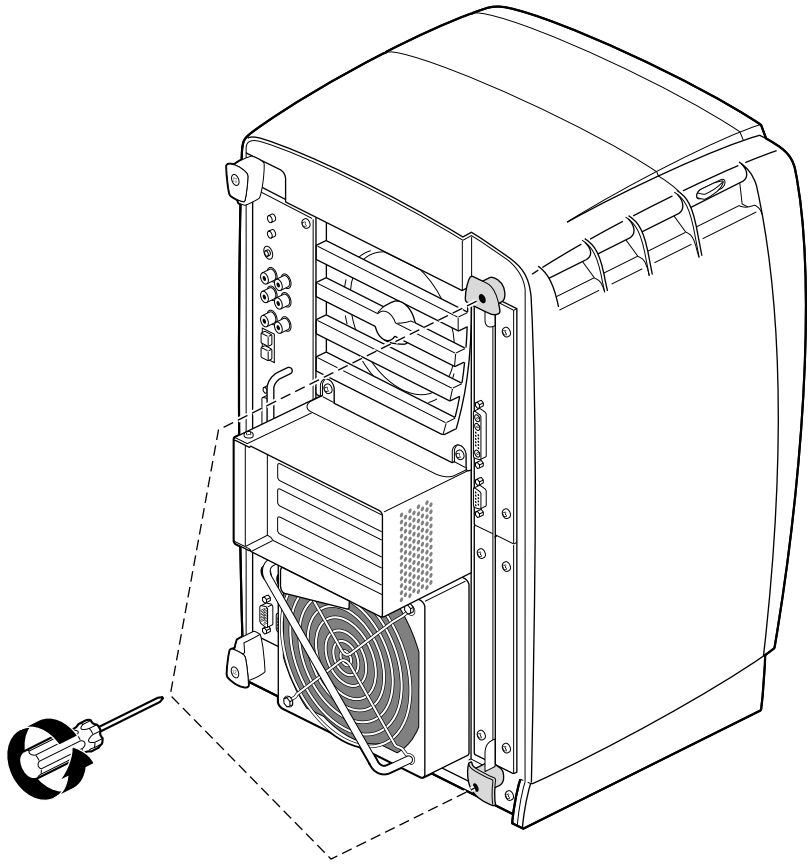

Figure 1-6 Removing the XIO Module Screws

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.

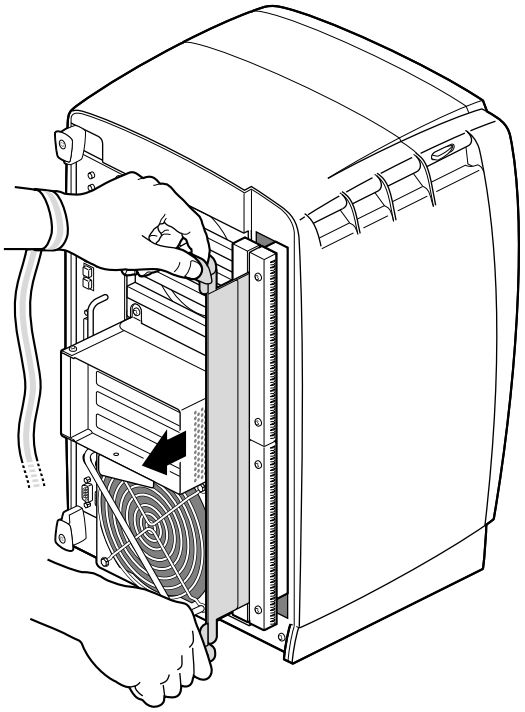

Figure 1-7 Releasing the XIO Module

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.

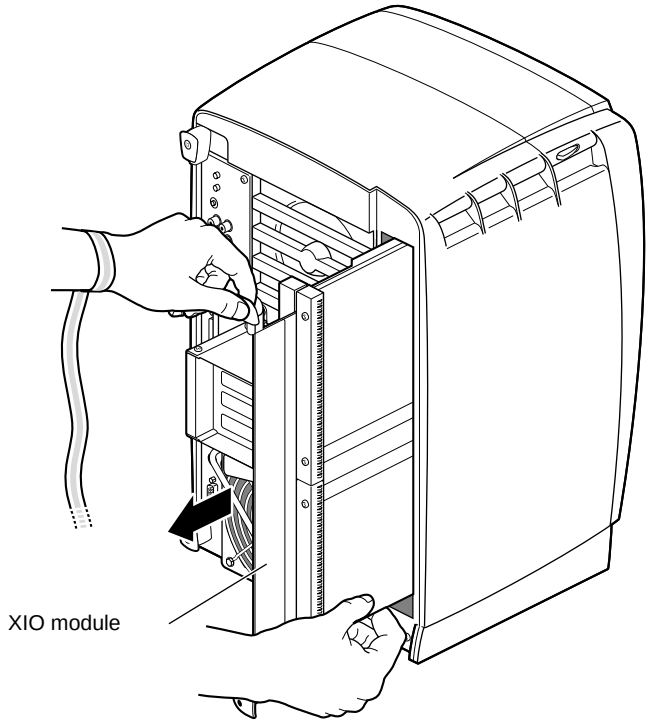

Figure 1-8 Removing the XIO Module

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.

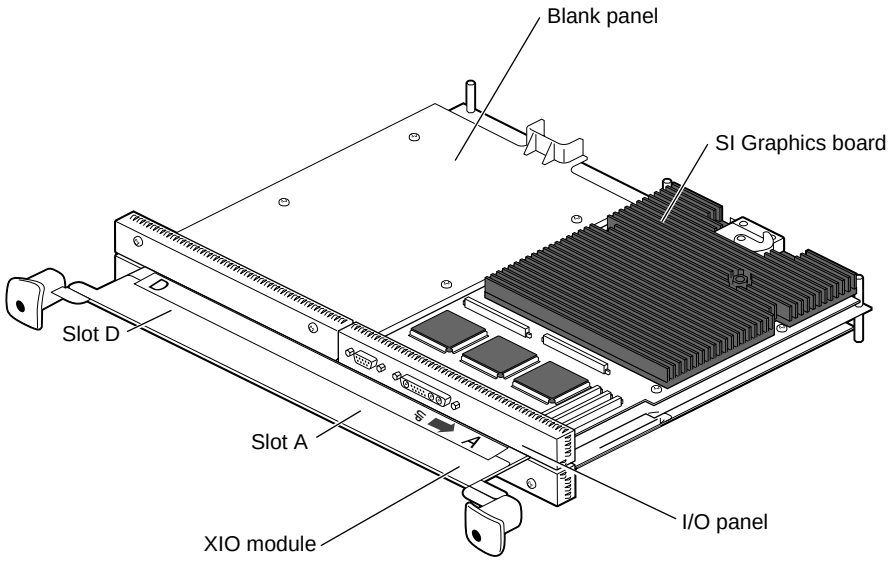

Figure 1-9 Placing the XIO Module on Its Side

The handle area protrudes when the XIO module is out of the chassis. When the handle protrudes, the identification slots for the XIO boards, D and A are visible; slots B and C are on the reverse side. See Figure 1-9.

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.

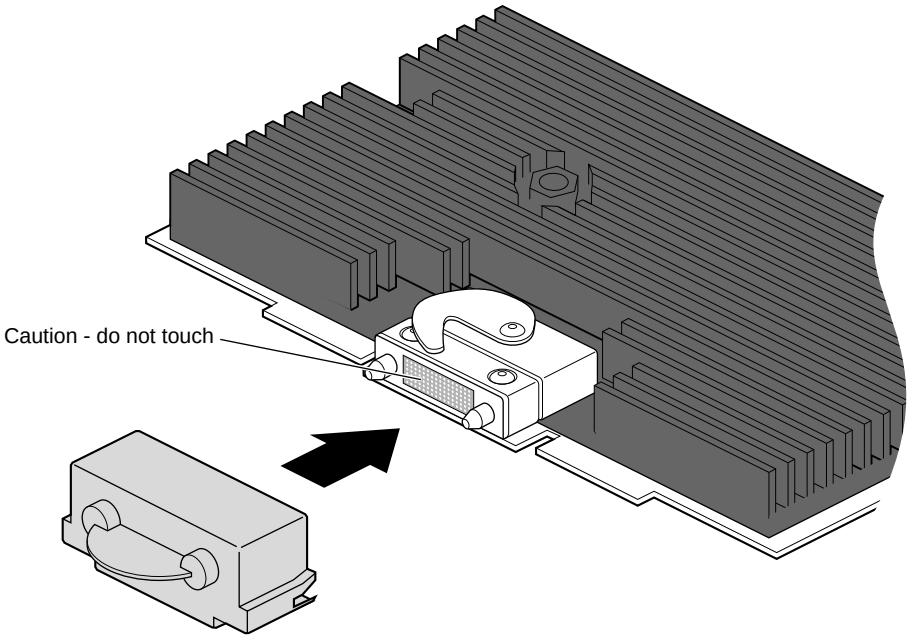

Figure 1-10 Placing a Cap on the XIO Compression Connector

6. Place a cap on the XIO graphics board compression connector. Spare caps are shipped with the OCTANE workstation. See Figure 1-9.

   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 the 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 Connectors.”

About the XIO Module and Dual Head Graphics

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 OCTANE/MXI graphics boards which occupy two slots, A and D.

- The XIO graphics boards must be placed toward the interior of the workstation as you insert the module, or they may overheat and be damaged.
- The primary head graphics board must be in slot A (SI) or slots A and D (SSI or MXI). The secondary head, SI 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 with texture memory option board (as the primary head), OCTANE/SI with texture memory option board (as the secondary head).
- The secondary graphics board occupies slot B, unless it is occupied by an option board with flex cables to the graphics board. Then the secondary graphics board occupies slot C. (Exception: Do not install a secondary 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 daughter boards.)

Removing the Blank Panel

Before removing a 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 the OCTANE/SI Board" on page 3 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. Then return here to remove the blank panel.

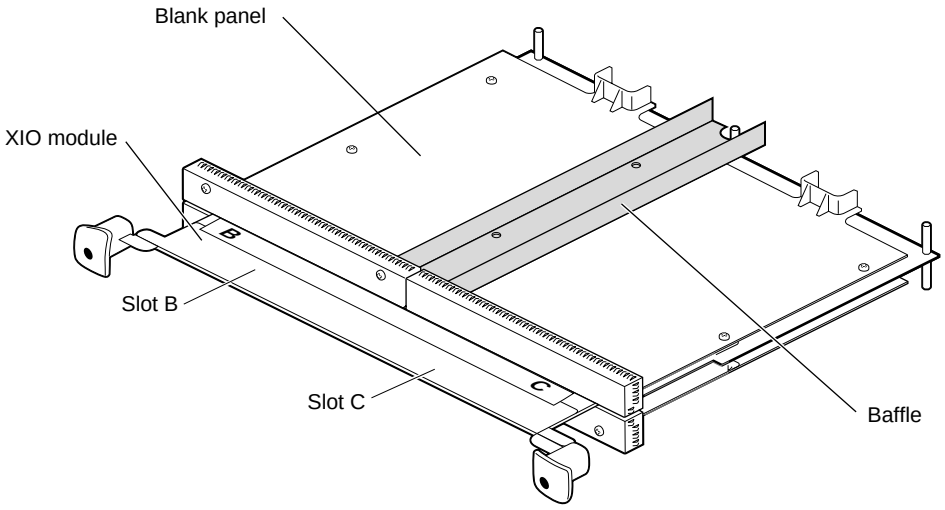

Figure 1-11 Identifying the Baffle and Blank Panel

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.

If you are installing the texture memory option board on the secondary graphics board, (only in an OCTANE/SI with texture memory and OCTANE/SI 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.

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

Caution: If the Digital Video option board is in slot B, remove it before installing the secondary graphics board in slot B. Dual head and Digital Video options 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 second 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 option board's installation guide for instructions on removing that option board.

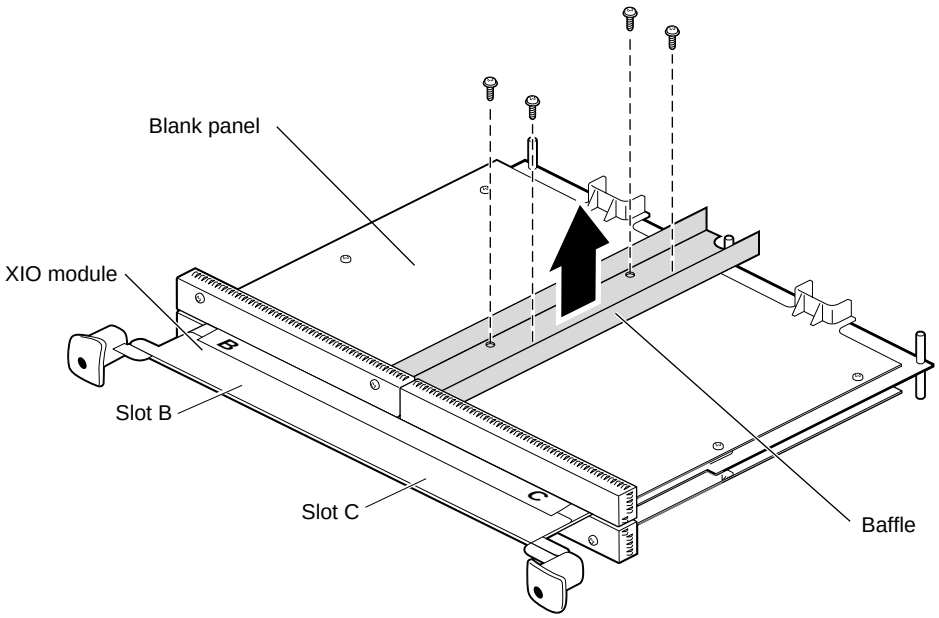

Figure 1-12 Removing the Baffle

If you are removing a blank panel that is next to an option or graphics board, skip to step 2. If you are removing a blank panel that is side-by-side with another blank panel, go to the next step.

1. 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 "Attaching the Secondary Head to the XIO Module" on page 17.

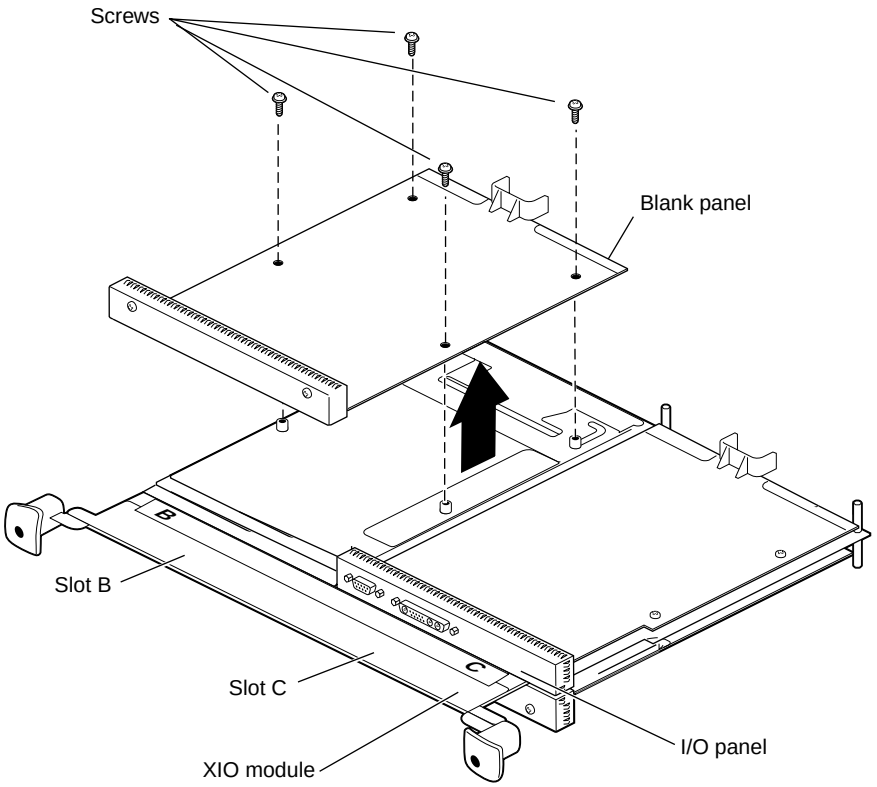

Figure 1-13 Removing the Blank Panel

2. Using a Phillips screwdriver, remove the screws from the blank panel or option board.
3. 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.
4. With the same side facing up, place the board on a clean, antistatic surface.
5. Go to the next section to install a second graphics board.

Attaching the Secondary Head to the XIO Module

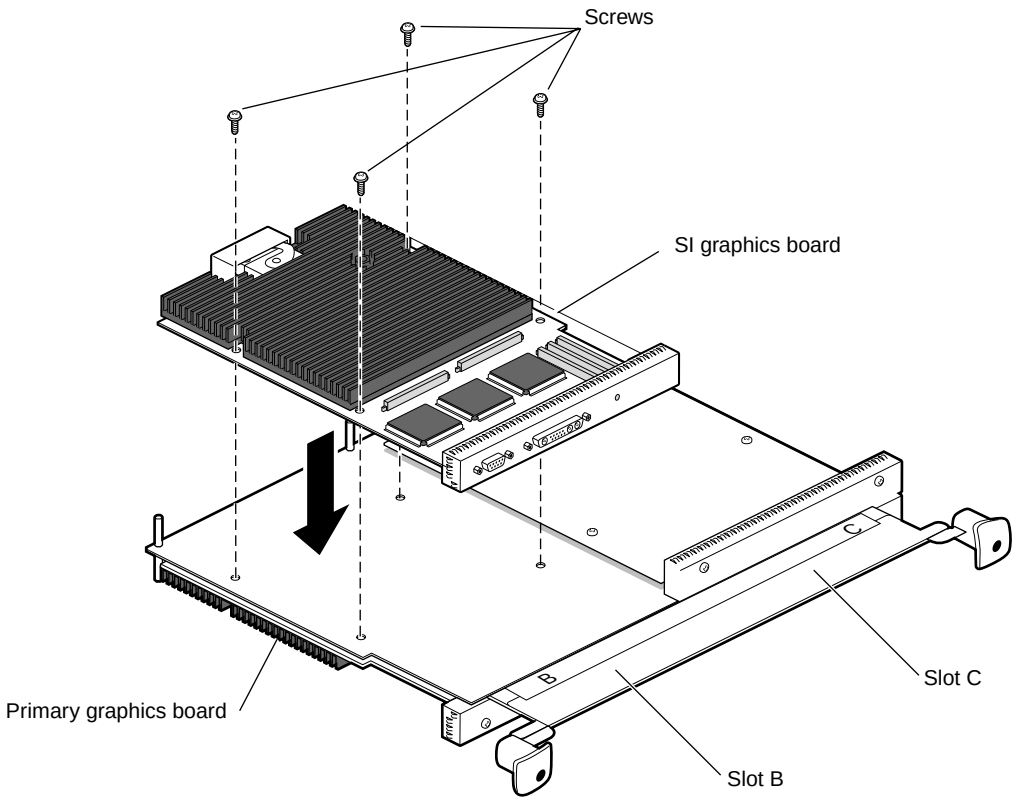

Figure 1-14 Inserting the Secondary Graphics Board

1. Place the secondary 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.)

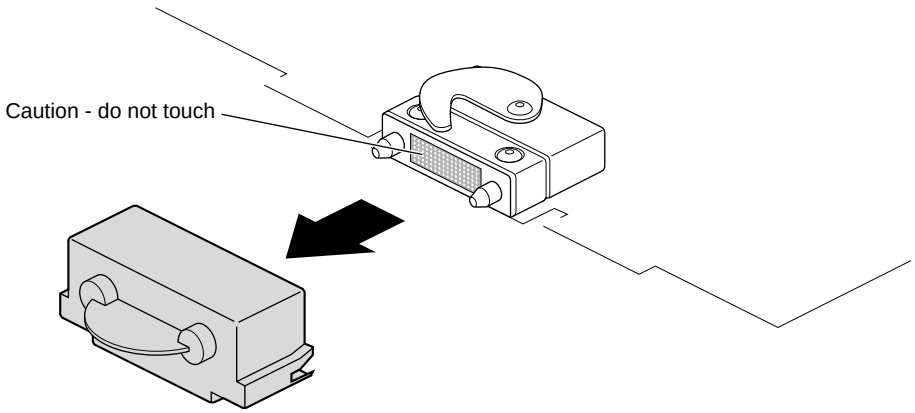

Figure 1-15 Removing the Cap From the XIO Compression Connector

3. Remove the caps from the XIO compression connectors.
4. Keep the caps from the XIO 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.

Replacing the XIO Module

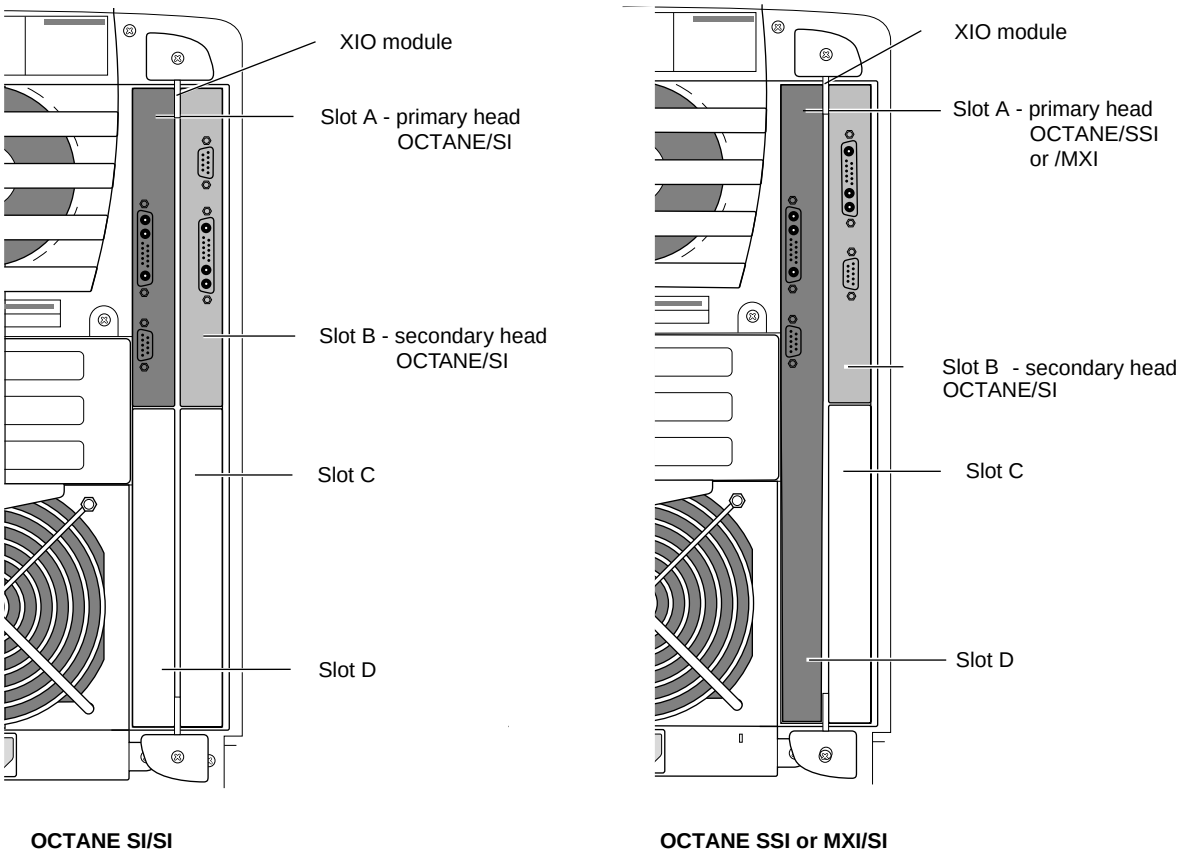

Figure 1-16 Placing the Primary Head Graphics Boards Toward the Interior of the Workstation

Caution: Replacing the XIO module with the primary head graphics boards toward the interior of the workstation prevents overheating and damage to the boards. Replace the XIO module as shown in Figure 1-16.

If the XIO module is incorrectly inserted with an OCTANE/SSI or MXI 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.

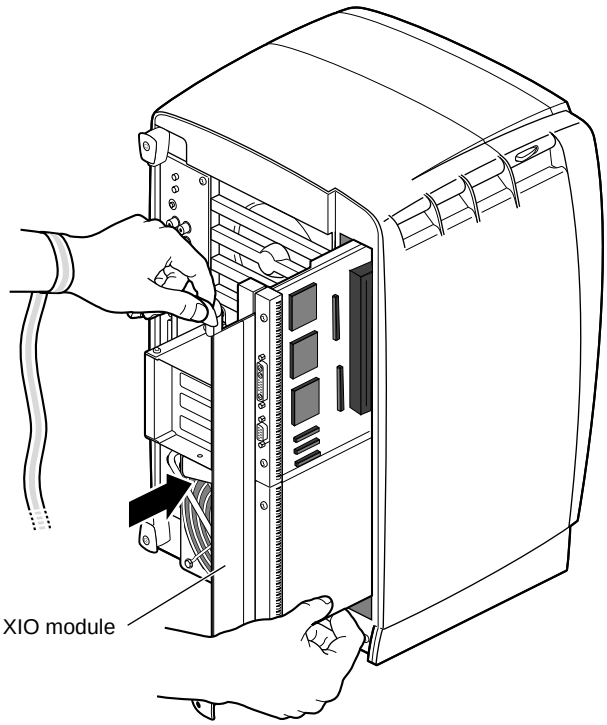

Figure 1-17 Replacing the XIO Module

1. Replace the XIO module in the OCTANE workstation. 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 1-17.

   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.

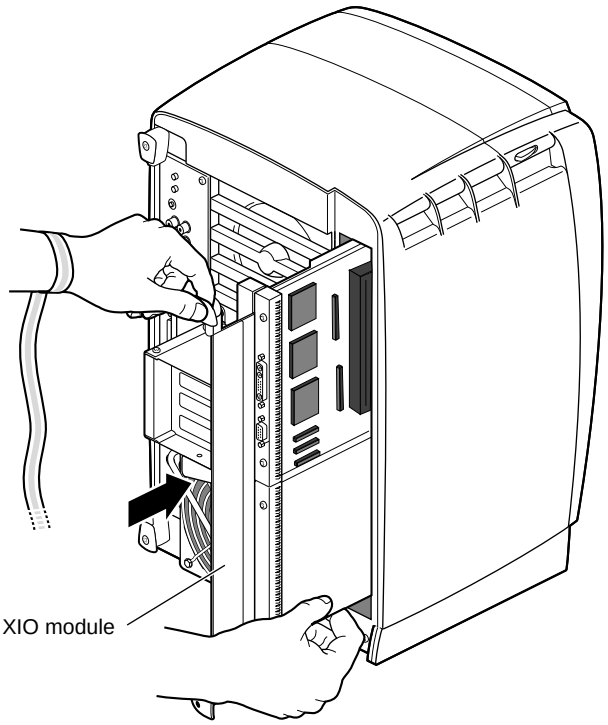

Figure 1-18 Inserting the XIO Module

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

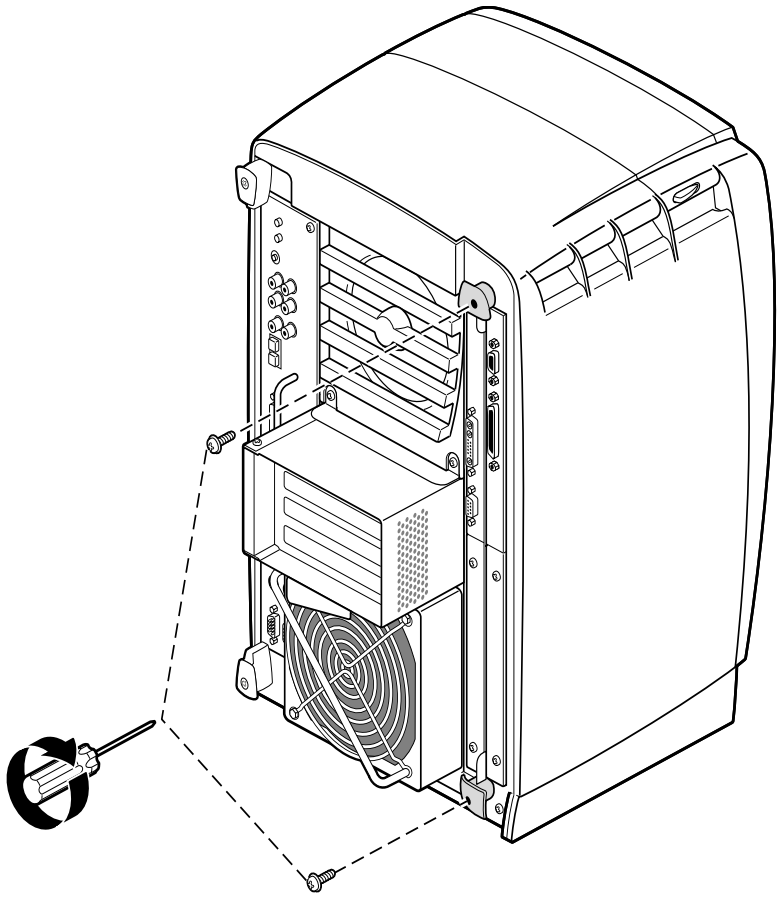

Figure 1-19 Replacing the XIO Module Screws

5. Tighten the captive screws in the handles.
6. Remove the wrist strap.

You are finished resplacing the XIO module. If you received a regulatory upgrade label, go to the next section for instructions on attaching it to the OCTANE workstation. Then go to Chapter 3, “Connecting the Monitors,” on page 31.

If you did not receive a regulatory upgrade label, go to Chapter 3, “Connecting the Monitors,” on page 31.

Placement of a Regulatory Label

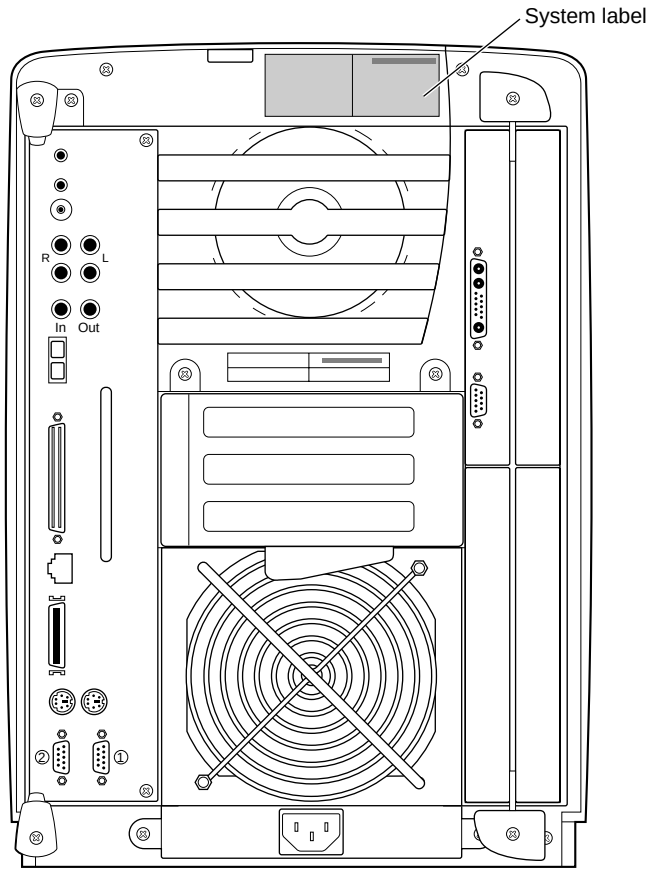

Figure 1-20 Locating the System Label

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.

Chapter 2

Removing the OCTANE/SI Graphics Board

Preparing to Remove the OCTANE/SI Graphics Board

Before removing the OCTANE/SI secondary head graphics board, you must power off the OCTANE workstation, wait 5 minutes for the heat sinks to cool, attach a wrist strap, and remove the XIO module. If you have not already done so, see "Preparing the Workstation to Install the OCTANE/SI Board" on page 3 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. Then return here for instructions on removing the secondary graphics board.

Caution: Do not touch the gold (front) surface of the XIO compression connector. Touching it could damage the connector. Place a protective cap on the 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 Connectors."

Note: If you need to replace the primary head graphics board, have the replacement graphics board beside you before you begin removing the primary head graphics board.

The processes for removing a graphics board and blank panel are the same.

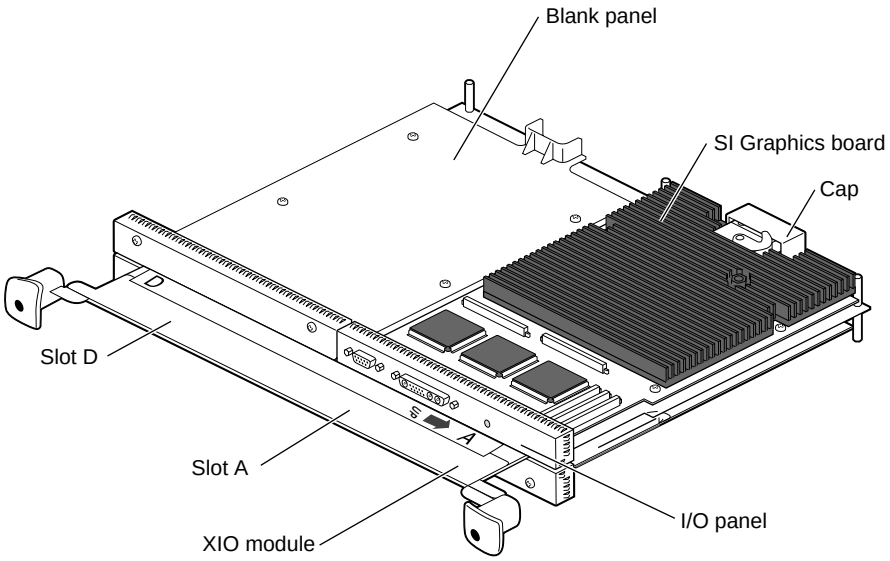

Figure 2-1 Identifying the Primary Head Graphics Board

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.

The graphics board in slot A (OCTANE/SI) or slots A and D (OCTANE/SSI or MXI) is the primary head in a dual head system. For graphics board identification, see Appendix C. The primary head graphics board also carries the texture memory option boards in a dual head system. (The only exception is OCTANE/SI with texture memory option board as the primary head, and OCTANE/SI with texture memory option board as the secondary head.)

The secondary graphics board is in slot B or possibly C.

Note: For illustration purposes, because slot B is the preferred location of the second head, the secondary graphics head is shown in slot B.

Detaching the OCTANE/SI Graphics Board From the XIO Module

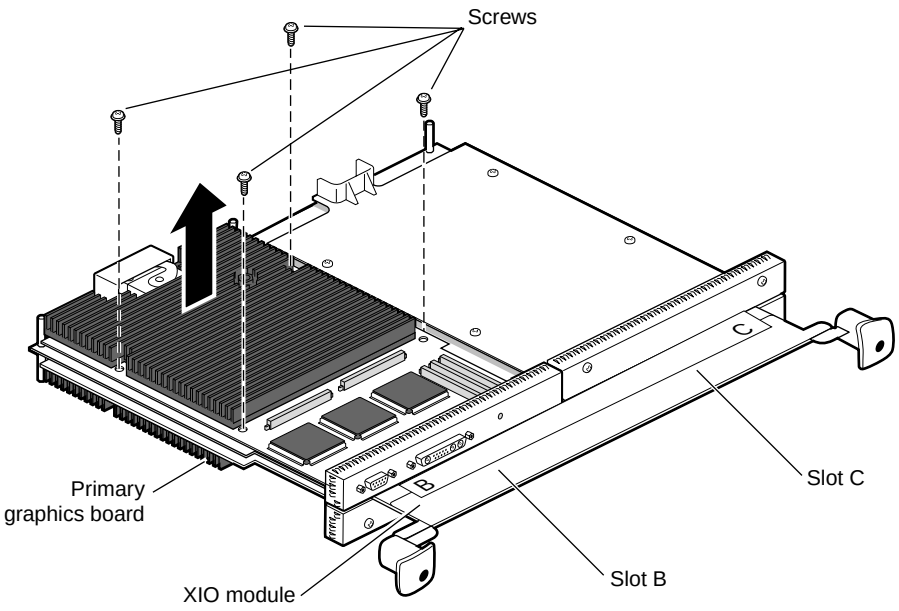

Figure 2-2 Removing the Screws From the Secondary Graphics Board

1. Turn the XIO module so that the secondary graphics board faces you.
2. Using a Phillips screwdriver, remove the four screws from the OCTANE/SI graphics board.
3. Grasp the graphics board by its I/O panel and on the opposite side of the board, and lift.
4. With the same side facing up, place the board on a clean, antistatic surface.

Placing a Graphics Board, Blank Panel or Option Board in the Open Slot

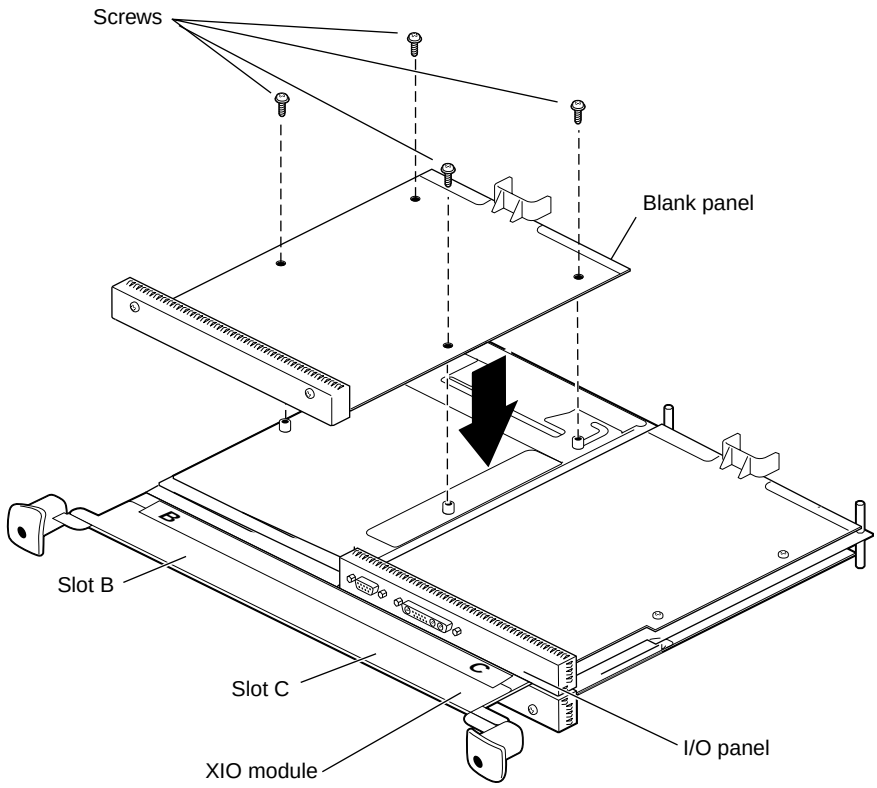

Figure 2-3 Placing a Blank Panel on the XIO Module

1. Place a new secondary graphics board, blank panel, or other XIO board in the slot from which you just removed the secondary graphics board.
   - Place the new graphics board, blank panel, or option XIO board on the standoffs.
   - 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.)

Table 2-1 How to Proceed

If you installed:	Go to:
An option board in the empty slot.	The installation guide for the option board and follow the instructions in that manual to complete the installation.
A graphics board in the empty slot.	Step 3.
A blank panel in the empty slot that is next to a graphics or option board.	Step 3.
A blank panel in the empty slot next to another blank panel.	The next step.

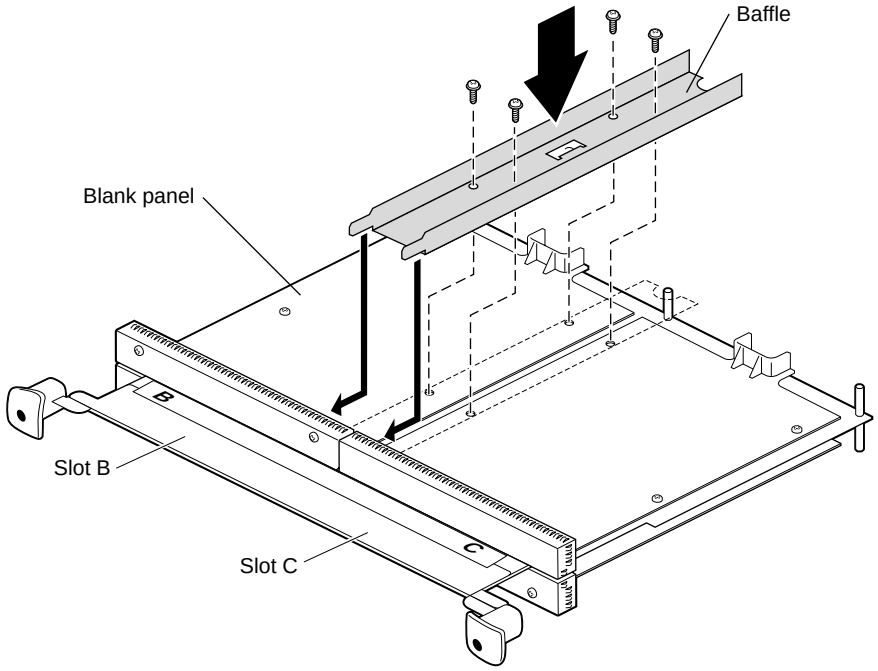

Figure 2-4 Installing the Baffle Across Two Blank Panels

2. If your board configuration results in two side-by-side blank panels, install a baffle across them.
   - Place the blank panel on the standoffs.
   - Replace only 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.
3. Remove the caps from any compression connectors.

Go to "Replacing the XIO Module" on page 19 to install the XIO module and power on the OCTANE workstation.

Chapter 3

Connecting the Monitors

If you have not already done so, go to Chapter 1, and follow the instructions for installing the secondary graphics board before you begin setting up the monitors.

You can place your monitors side by side, or you can set them up in a stacked configuration. Follow the appropriate instructions for your configuration.

Unpacking the Secondary Monitor

Unpack the secondary monitor from its box.

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

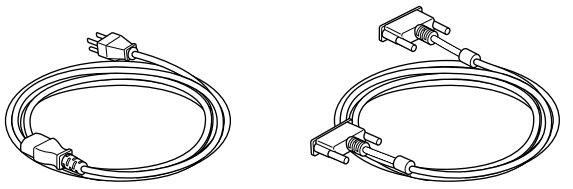

Figure 3-1 Identifying the Monitor Cables

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

Connecting Cables to the Monitors in a Side-by-Side Configuration

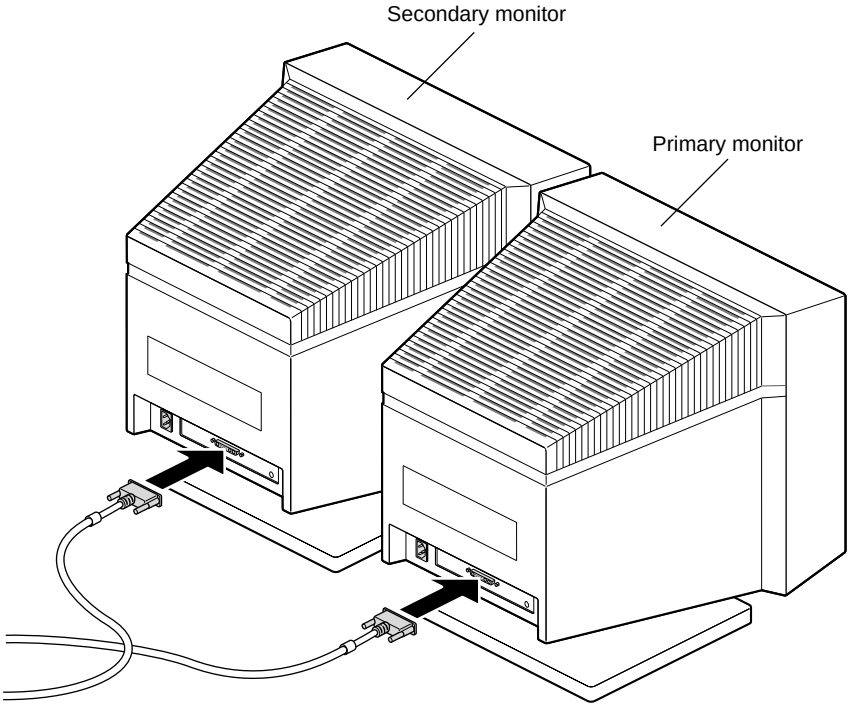

Figure 3-2 Placing the Monitors Side by Side in a SI/SI Configuration

1. Facing the front of the monitors, place the primary monitor on the left and the secondary monitor on the right. The secondary monitor is the monitor that is part of the dual head shipment.
2. Connect one end of each monitor/workstation cable to the connector on the back of each monitor. Connect and tighten the thumbscrews on both sides of the connector.

See the following configuration sections to determine where, on the back of the OCTANE workstation, to connect the other end of the primary and secondary monitor cables.

Note: It's important that you connect the primary monitor cable to the correct monitor connector on the XIO module of the OCTANE workstation or your cursor movements between monitors will be confusing.

Connecting the Monitor Cables to the Workstation in an SI/SI or SI With Texture Memory/SI Configuration

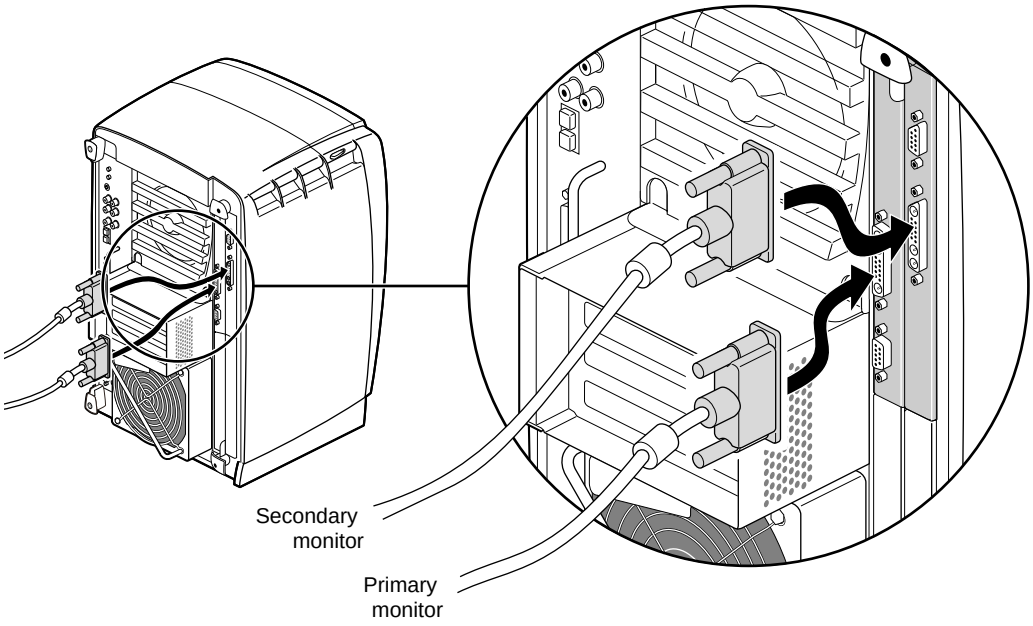

Figure 3-3 Connecting the Monitor/Workstation Cables in an SI/SI Configuration

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 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 Power Cables” on page 39.

Connecting the Monitor Cables to the Workstation in an SSI/SI or MXI/SI Configuration

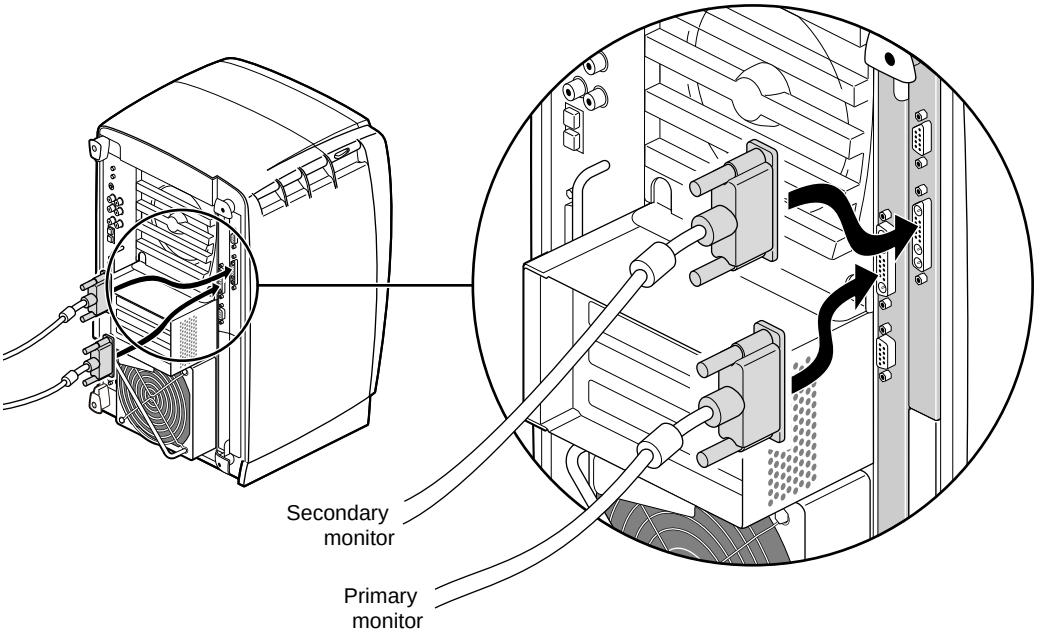

Figure 3-4 Connecting the Monitor Cables in a SSI/SI or MXI/SI Configuration

1. Connect the primary monitor cable to the primary graphics board in slot A (and D), toward the interior of the OCTANE workstation.
2. Connect the 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 Power Cables" on page 39.

Connecting the Cables to the Monitors in a Stacked Configuration

Follow these steps to connect the monitor cables to the monitors and the OCTANE workstation.

Note: If you use the stacked configuration, you must reconfigure the software. See Chapter 4 for instructions on reconfiguring the software.

It's important that you connect the primary monitor cable to the correct monitor connector on the OCTANE chassis. If the monitor cables are not connected correctly, your cursor movement between monitors will be confusing.

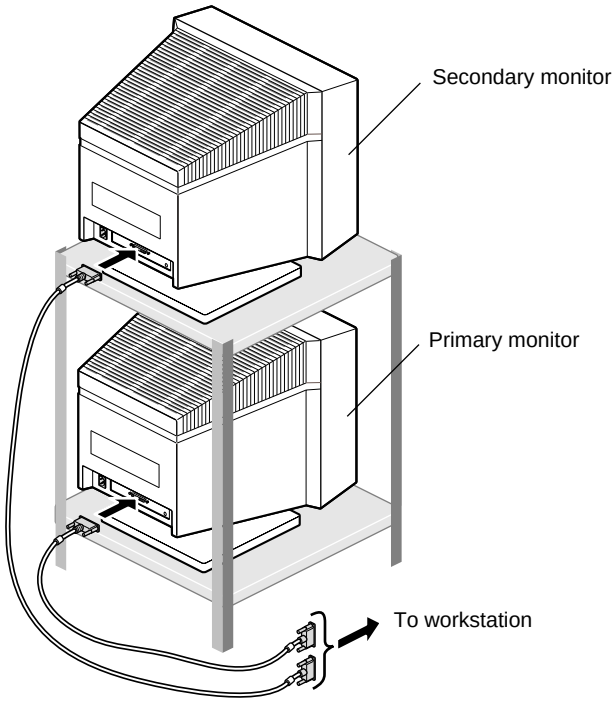

Figure 3-5 Placing the Secondary Monitor Above the Primary Monitor

1. Facing the front of the monitors, place the secondary monitor on a surface above the primary monitor. The secondary monitor is the monitor that is part of the dual head shipment.

   Caution: Do not rest the secondary monitor on the primary monitor. Place it instead on a bookshelf or similar type structure above the primary monitor.

2. Connect one end of the each monitor/workstation cable to the connector on the back of each monitor. Connect and tighten the thumbscrews on both sides of the connector.

   To connect the cables to the workstation, go to one of the two following sections appropriate for your configuration.

Connecting the Monitor/Workstation Cable in an SI/SI or SI With Texture Memory/SI Configuration

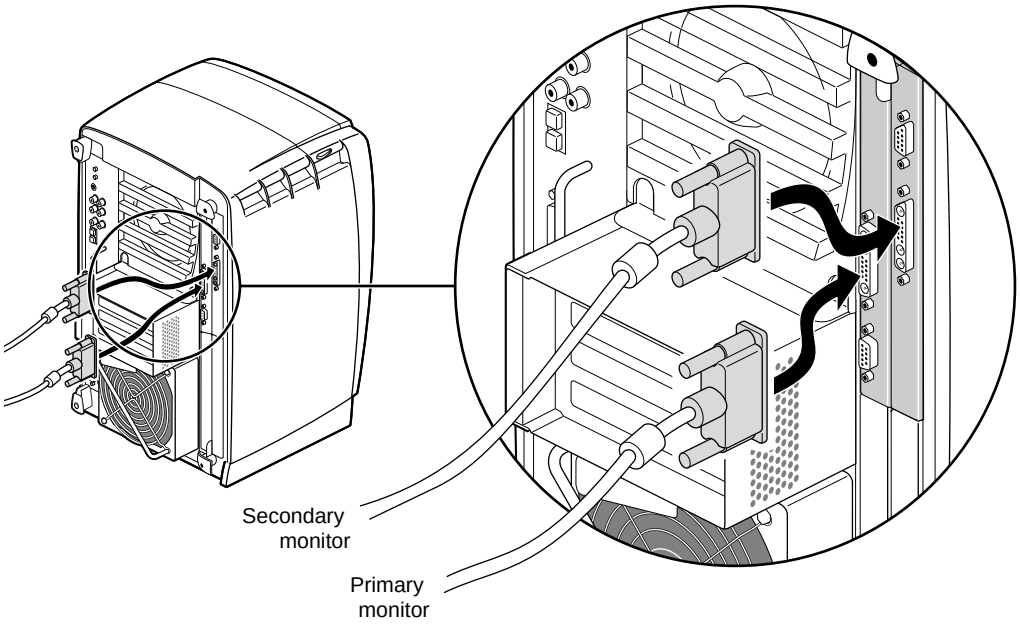

Figure 3-6 Connecting the Monitor/Workstation Cable in an SI/SI Configuration

1. Connect the primary monitor cable to the primary head graphics board, in slot A, toward the interior of the workstation.
2. Connect the secondary monitor cable to the secondary head graphics board in slot B, or possibly slot C. For illustration purposes, the secondary graphics board is shown in slot B.

You are finished connecting the monitor/workstation cables. Go to "Connecting the Power Cables" on page 39.

Connecting the Monitor Cables to the Workstation in an SSI/SI or MXI/SI Configuration

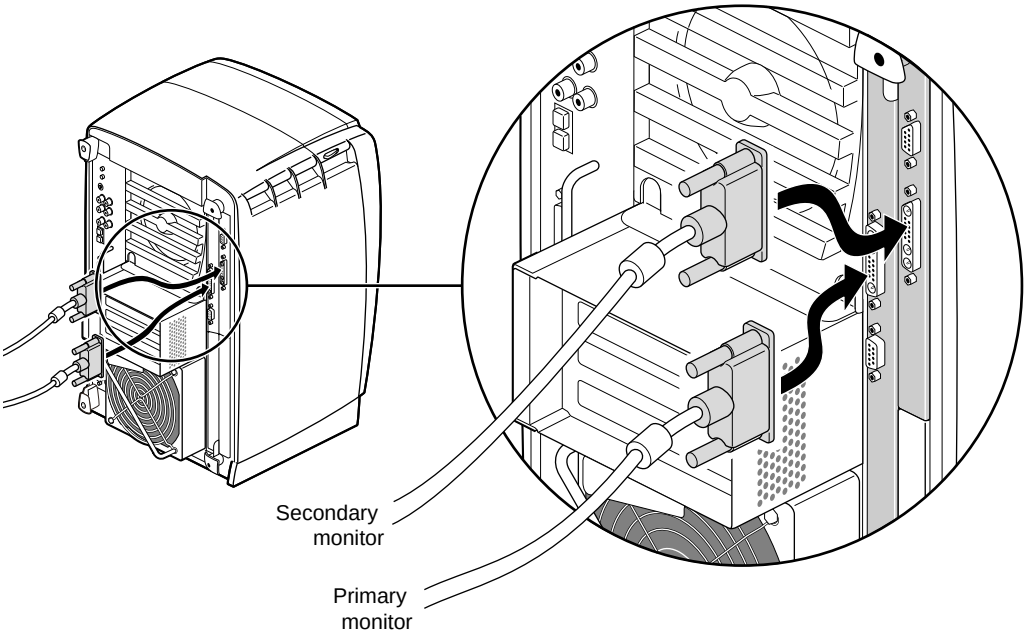

Figure 3-7 Connecting the Monitor/Workstation Cable in an SSI/SI or MXI/SI Configuration

1. Connect the primary monitor cable to the primary head graphics board, in slots A and D, toward the interior of the workstation.
2. Connect the secondary monitor cable to the secondary head graphics board in slot B, or possibly slot C. For illustration purposes, the secondary graphics board is shown in slot B.

You are finished connecting the monitor/workstation cables. Go to "Connecting the Power Cables" on page 39.

Connecting the Power Cables

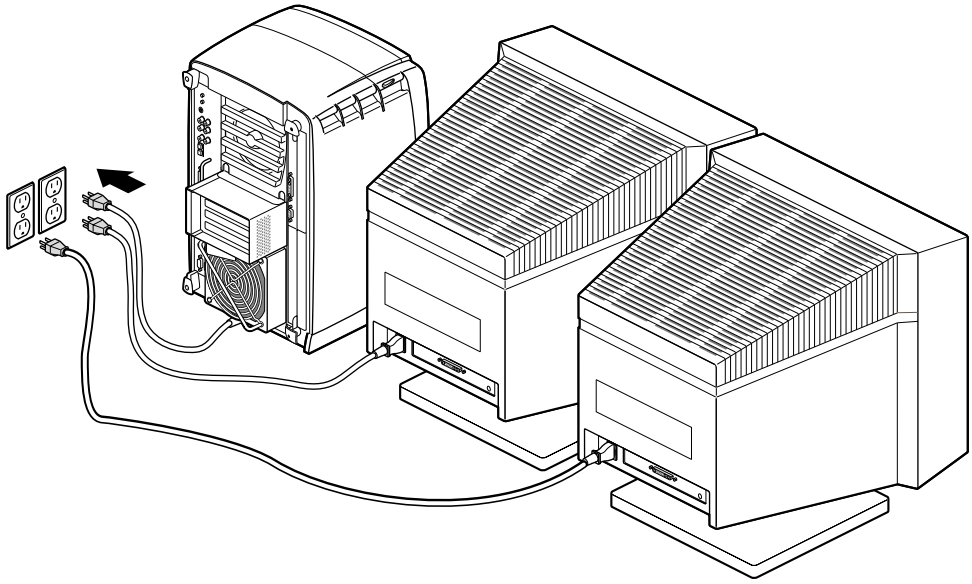

Figure 3-8 Connecting the Secondary Monitor's Power Cable

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 the 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.

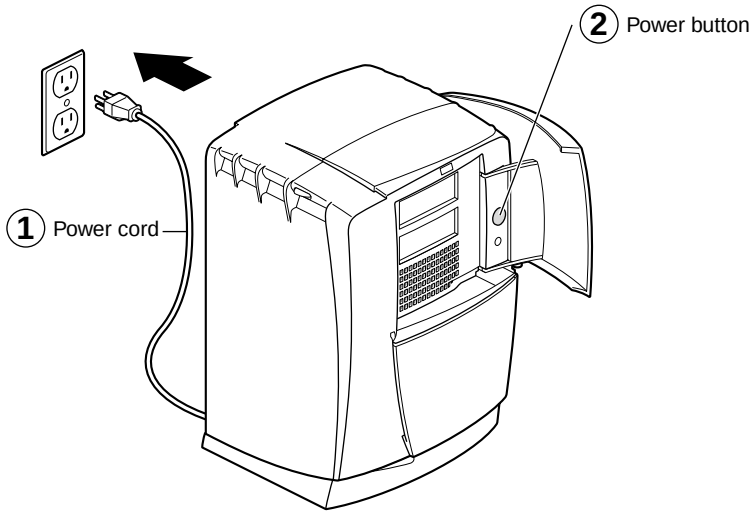

Figure 3-9 Powering On the OCTANE Workstation

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

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

You are finished installing the secondary (board and) monitor and are ready to install the software.

If you have a problem with your system, see Chapter 5, Troubleshooting.

Returning Parts

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

For product support information, see the Introduction to this guide.

Chapter 4

Installing the Software and Using the Dual Head System

This chapter explains how to use a dual head configuration.

Installing the Software

If you received a CD with your shipment, read the CD software installation booklet for information on installing the dual head software before proceeding.

If you stacked the monitors, be sure to reconfigure the software, as described in "Reconfiguring the Software for Stacked Monitors" on page 43.

Moving the Cursor From One Monitor to the Other

To move the cursor from one monitor to the other, move the cursor off the screen you are on toward the other monitor. The cursor jumps to the other monitor.

The default is for the primary monitor to be located on the left as you face the front of the monitors and the secondary monitor on the right. By default, the cursor moves from the primary to the secondary monitor, left to right, and back.

To switch cursor crossover locations, follow these instructions and refer to Table 4-1.

1. Move your monitors to the chosen position.
2. If your workstation is powered off, follow the steps in your *OCTANE Workstation Owner's Guide* to plug in the system and power it on.
3. Log in to the system.
4. Open a shell window on the primary head.
5. Place the cursor inside the shell window.
6. Become superuser by typing **`su`** and press <Return>.
7. Change the directory to access the *Xservers* file:
   `cd /usr/lib/X11/xdm`
8. Change the permissions on this file (to be able to write to it) before you begin by typing the command: **`chmod +rw Xservers`**
9. Using your favorite editor, open the *Xservers* file.
10. Add the appropriate line from Table 4-1 to the file.

    Note: The contents of the file should be on one line. Do not insert carriage returns.

Table 4-1 Changing Cursor Crossover Locations

If you want:	Add this:
Primary (0) on the left, Secondary (1) on the right (default)	Delete any command found in this table from the *Xservers* file.
Secondary (1) on the left, Primary (0) on the right	**`-hw board=0,left=1 -hw board=1,right=0`**
Primary (0) below, Secondary (1) above	**`-hw board=0,above=1 -hw board=1,below=0`**
Secondary (1) below, Primary (0) above	**`-hw board=0,below=1 -hw board=1,above=0`**

11. Save the file and exit the text editor.

    Caution: Close any open applications before you follow step 12. The command closes any running applications, and any unsaved work will be lost.

12. Restart your server.
    - Stay in super user mode.
    - Type on the command line: `killall Xsgi`
13. After a few seconds, the login window appears.
14. Log in to the 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 ":0.1," 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 on 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.

See Appendix A for more information on choosing a graphics head.

Reconfiguring the Software for Stacked Monitors

The dual head software's default is for monitors positioned side by side. If your monitors are stacked on top of each other, you need to reconfigure the software.

Follow these steps to reconfigure the software:

1. If your workstation is powered off, follow the steps in your *OCTANE Workstation Owner's Guide* to plug in the system and power it on.
2. Log in to the system.
3. Open a shell window on the primary head by selecting UNIX® Shell from the Desktop Toolchest.
4. Place the cursor inside the shell window.
5. Become superuser by entering **`su`** .
6. Then press <Return>.
7. Change the directory to access the *Xservers* file: **`cd /usr/lib/X11/xdm`**
8. Then press <Return>.
9. Change the permissions on this file (to be able to write to it) before you begin by typing the command: **`chmod +rw Xservers`**
10. Using your favorite text editor, open the *Xservers* file. Once you are in the Xservers file, You see a line that reads:
    `0 secure /usr/bin/X11/x -bs -c -pseudomap 4sight`
11. Add `-stacked` to the end of the following line:
    `0 secure /usr/bin/X11/x -bs -c -pseudomap 4sight`

    It now reads: `0 secure /usr/bin/X11/x -bs -c -pseudomap 4sight -stacked`
12. Save the file and exit the text editor.

    Caution: Close any open applications before you follow the step 11. The command closes any running applications, and any unsaved work will be lost.
13. Restart your server.
    - Stay in super user mode.
    - Type on the command line: **`killall Xsgi`**
14. After a few seconds, the login window appears.
15. Log in to the system.

You are finished reconfiguring the software for stacked monitors.

Chapter 5

Troubleshooting

This chapter provides you with troubleshooting information and one diagnostic test. See Table 5-1 for information about specific symptoms and remedies.

Be sure you have installed any software that came with the second graphics board.

Check the Troubleshooting chapter in your *OCTANE Workstation Owner's Guide* for troubleshooting tips for the OCTANE workstation.

Primary Head Default

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

Blank Screen or Screen With Faulty Images

Table 5-1 Troubleshooting

If you see:	Take this action:	Then:	Then:
Blank screen or screen with faulty images: SI/SI or SI with texture memory board/SI configuration.	1. Using the *gfxinfo* command, (instructions given in the next section). 2. Read the info in the file.	If both graphics boards appear in the inventory, call your service representative. If only one board appears in the inventory, perform the diagnostic test in this chapter.	Call your service representative to report software problems or to order a new graphics board.
Blank screen or screen with faulty images: SSI/SI or MXI/SI configuration.	1. Using the *gfxinfo* command (instructions given in the next section). 2. Read the info in the file.	If both graphics boards appear in the inventory, call your service representative. If only one board appears in the inventory, perform the diagnostic test in this chapter.	Call your service representative to report software problems or to order a new graphics board.

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.

1. If you see `Graphics board 0 is 'IMPACT' graphics`, and `Graphics board 1 is 'IMPACT' graphics`, call your service representative.
2. 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 that is 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 a board in slot A, for example, is not recognized in slot A, but is recognized in the alternate slot, the software is faulty.

Caution: You must not swap SSI or MXI 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 SI/SI Configuration" on page 48 or "Diagnostic Test for an SSI/SI or MXI/SI Configuration" on page 52.

Diagnostic Test for an SI/SI Configuration

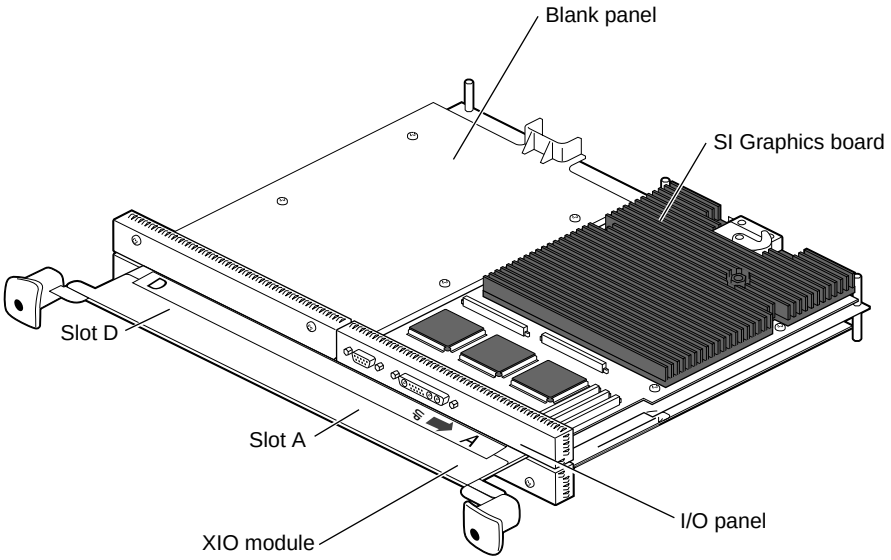

Figure 5-1 SI Graphics Board in Slot A

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

1. Go to Chapter 1, “Preparing the Workstation to Install the OCTANE/SI Board” on page 3 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. Caps came with the OCTANE workstation.
3. Determine where on your desk you will place each board, so you can determine which board was in which slot.

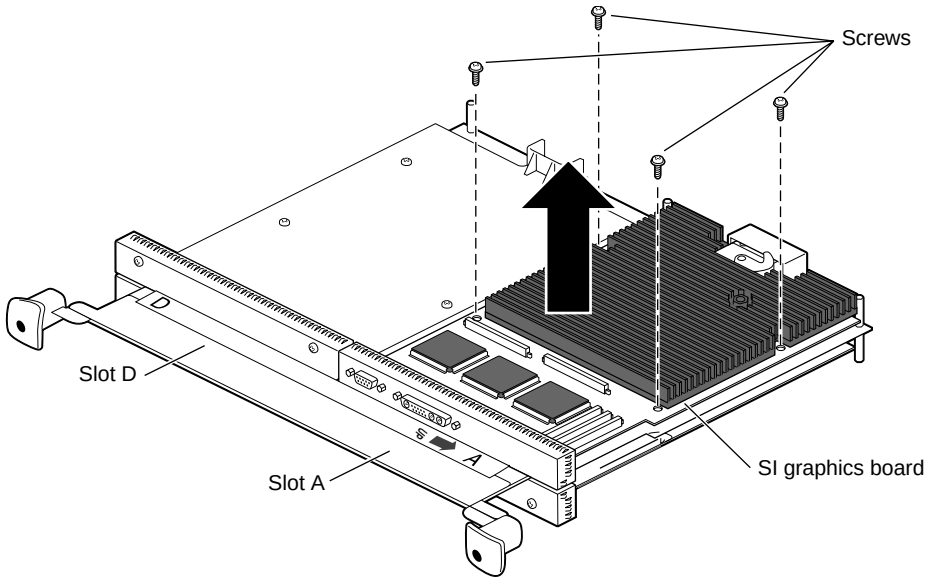

Figure 5-2 Removing the Primary SI Graphics Board From the XIO Module

4. Remove the four screws that hold the SI graphics board in slot A to the XIO module.
5. Lift the graphics board off the XIO module, and place it on an clean, dry, antistatic surface. Your desktop works well.
6. Turn the XIO module so that the secondary graphics board faces you.
7. Follow steps 4 and 5 to remove the second graphics board.
8. Place the secondary 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 graphics board.

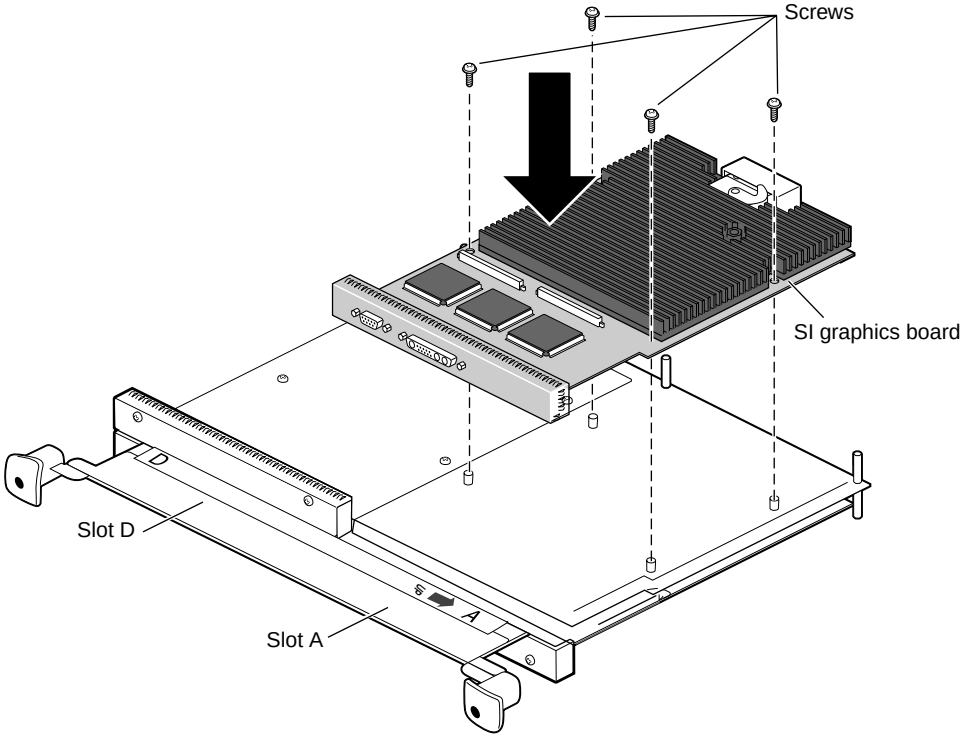

Figure 5-3 Placing the Secondary SI Graphics Board Into Slot A

11. Place a blank panel in the slot that held the secondary graphics board.
12. Replace the four screws.
13. Remove the caps from the compression connectors.
14. Go to "Replacing the XIO Module" on page 19 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 5-2 Diagnostic Test Results - SI/SI or SI with texture memory board/SI 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, “Preparing the Workstation to Install the OCTANE/SI Board” on page 3 and follow the directions 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 SI/SI configuration, place the SI graphics board on your desk so you can determine which of the SI 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 graphics board.

5. Remove the second SI 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 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 SI graphics board.
9. Remove the caps from the compression connectors.
10. Go to "Replacing the XIO Module" on page 19 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 SSI/SI or MXI/SI Configuration

The diagnostic test for the OCTANE workstation with a SSI/SI or MXI/SI configuration is different from a SI/SI or SI with texture memory option board/SI configuration.

You cannot swap the heads in an SSI/SI or MXI/SI 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 SI graphics board in slot A.

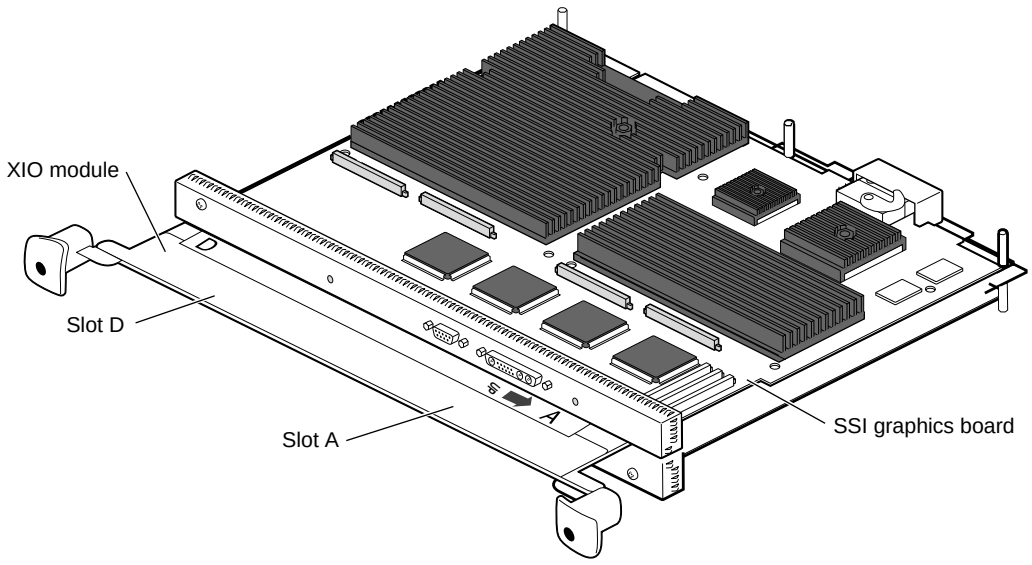

Figure 5-4 Identifying the Primary SSI Graphics Board in Slots D and A

1. Go to Chapter 1, “Preparing the Workstation to Install the OCTANE/SI Board” on page 3 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. Caps came with the OCTANE workstation.
3. Turn the XIO module so that slots D and A (the SSI or MXI graphics board) are facing you.

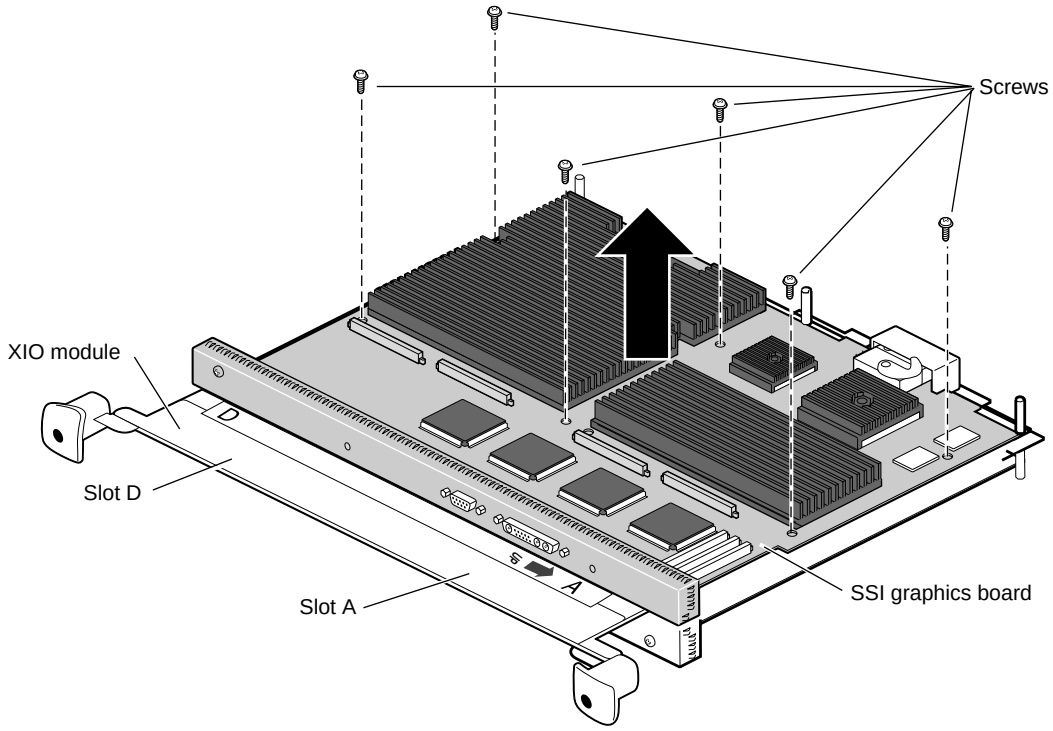

Figure 5-5 Removing an Primary SSI Graphics Board

4. Remove the six screws that hold the SSI or MXI graphics board to the XIO module.
5. Place the SSI or MXI graphics board on an clean, dry, antistatic surface. Your desktop works well.
6. Turn the XIO module so that the secondary graphics board faces you.

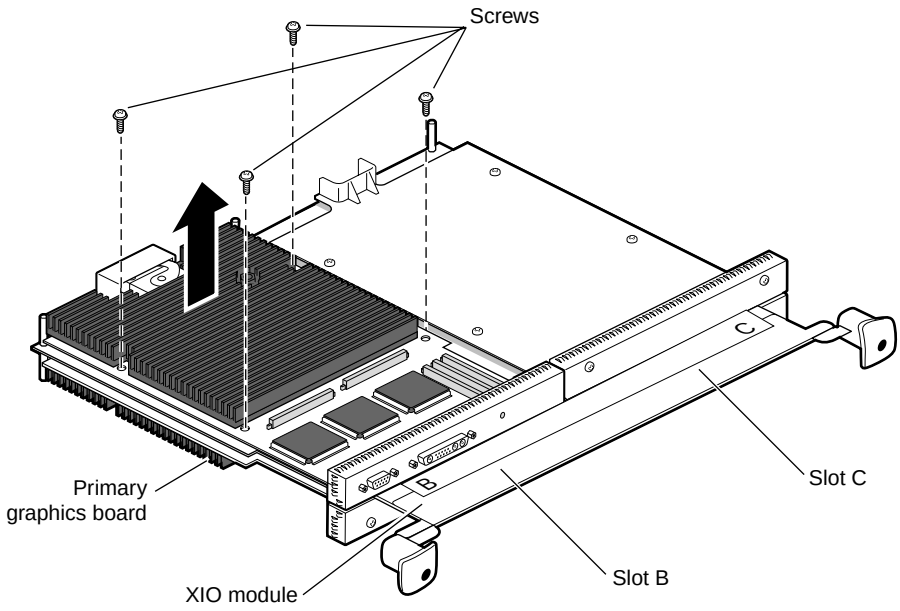

Figure 5-6 Removing the Secondary SI Graphics Board

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

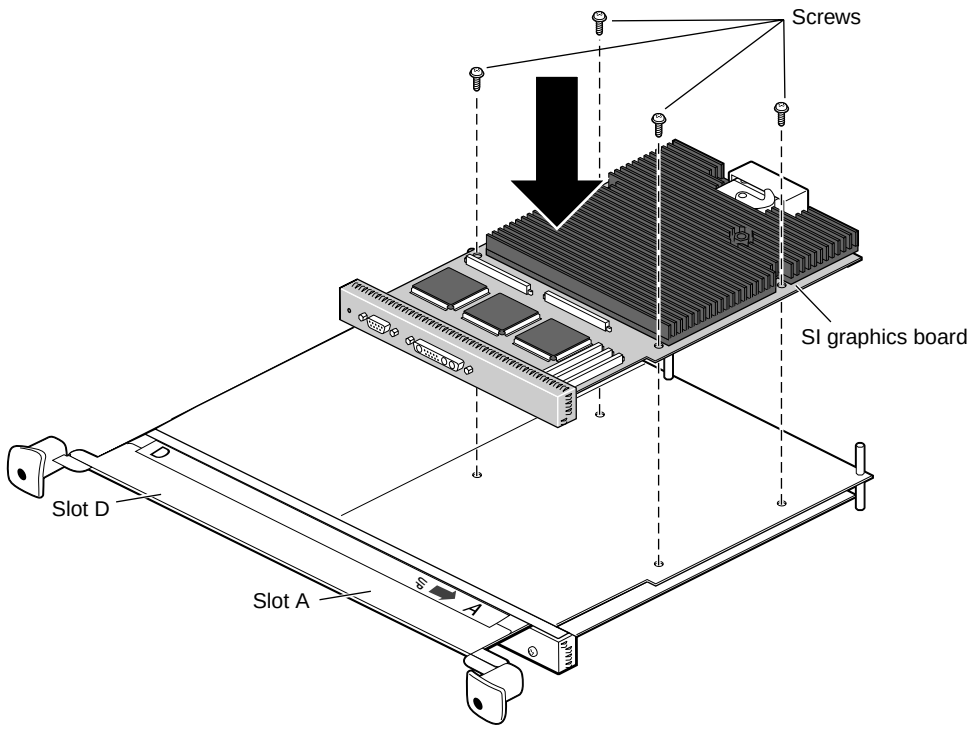

Figure 5-7 Placing the Secondary SI Graphics Board in Slot A

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

    Caution: Do not place the SSI or MXI graphics board in slots B and C.

15. Go to "Replacing the XIO Module" on page 19 and follow the directions for replacing the XIO module through powering on the workstation. Then go to the next section to check and diagnose the configuration.

Checking and Diagnosing the Configuration

Table 5-3 Diagnostic Test Results - SSI/SI or MXI/SI 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. 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. 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, “Preparing the Workstation to Install the OCTANE/SI Board” on page 3 and follow the directions 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 secondary graphics board from slot A.
   - Remove the four screws holding the SI 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 SSI or MXI 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 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 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 SI graphics board in the empty slot.
10. Insert and tighten the fours screws that attach the secondary SI graphics board to the XIO module.
11. Remove the caps from the compression connectors.
12. Go to "Replacing the XIO Module" on page 19 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.

Appendix A

Choosing a Graphics Head (for Developers)

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/SI with texture memory option board or SI/MXI) dual-head configuration, the SI with texture memory option board or MXI head is always screen zero, while the SI head is always screen one. Be careful about which head you choose if you don't decide to default to the value of DISPLAY. 3D graphics run faster on an MXI board than on an SI board. The MXI graphics board runs texture mapping much faster than the SI graphics 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;
```

where *gsnr* is the screen number relative to the current server—that is, zero for screen :0.0 or one for :0.1.

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.

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 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.

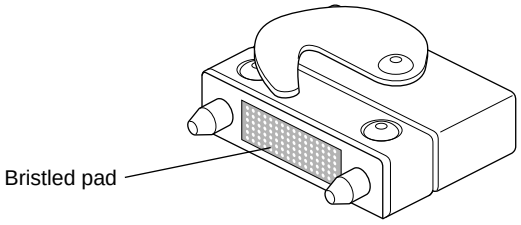

Figure B-1 Identifying the Bristled Pad of the Compression Connector

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 air or inert gas. The Envi-ro-tech™ Duster 1671 product manufactured by *TECHSPRAY*™ (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.

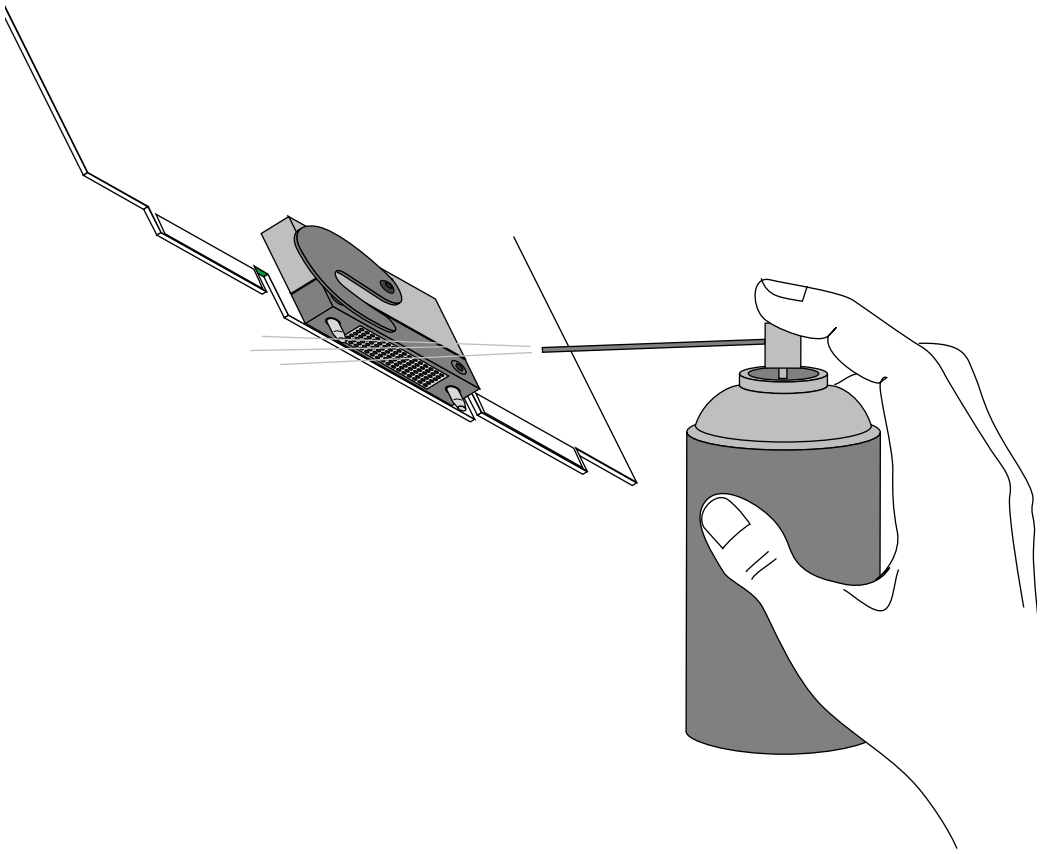

Figure B-2 Spraying the Compression Connector

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.

Appendix C

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

OCTANE/SI Graphics Board

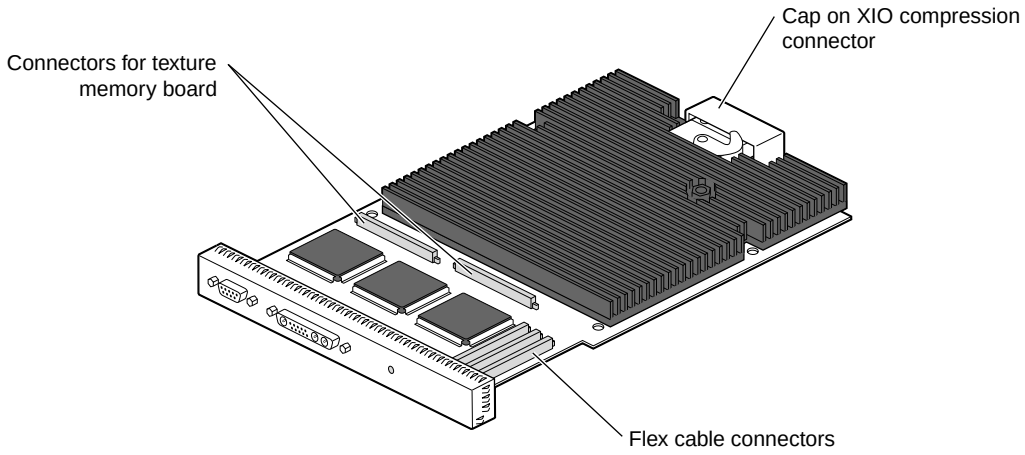

Figure C-1 OCTANE/SI Graphics Board

OCTANE/SI With Texture Memory Option Board

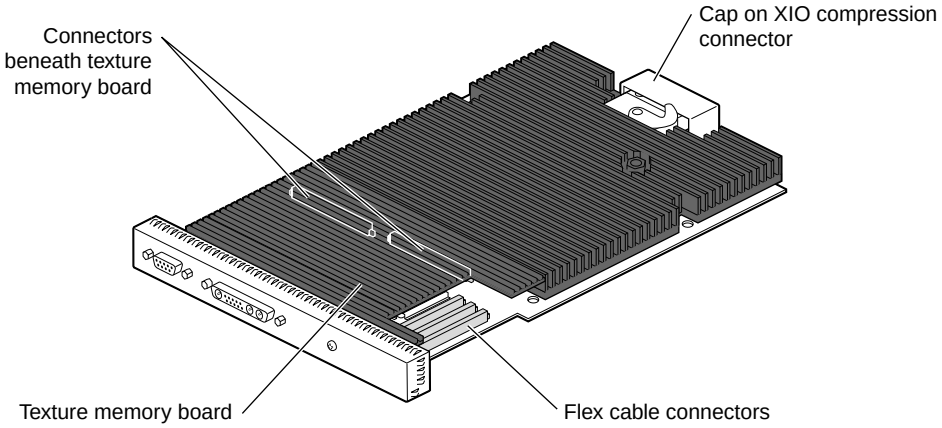

Figure C-2 OCTANE/SI With Texture Memory Option Board

OCTANE/SSI Graphics Board

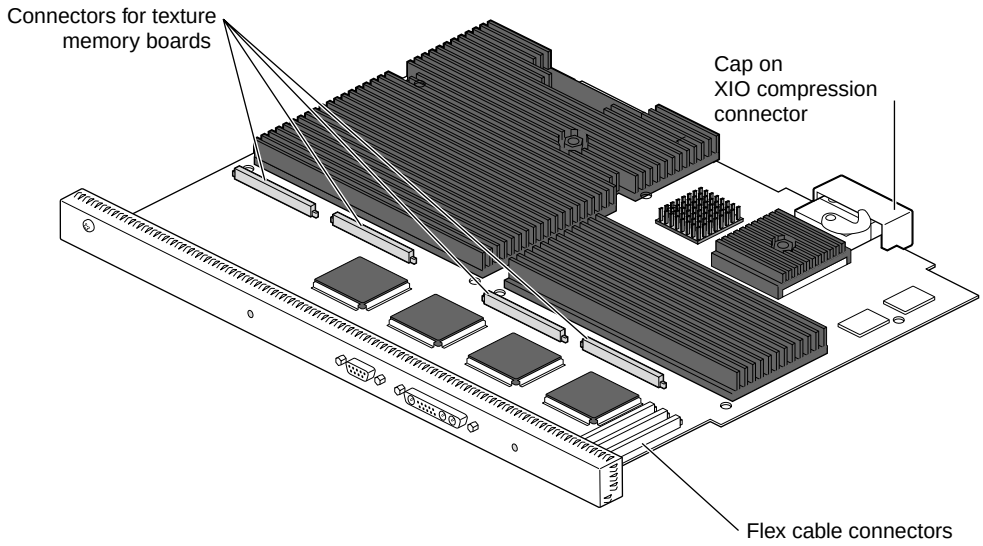

Figure C-3 OCTANE/SSI Graphics Board

OCTANE/MXI Graphics Board

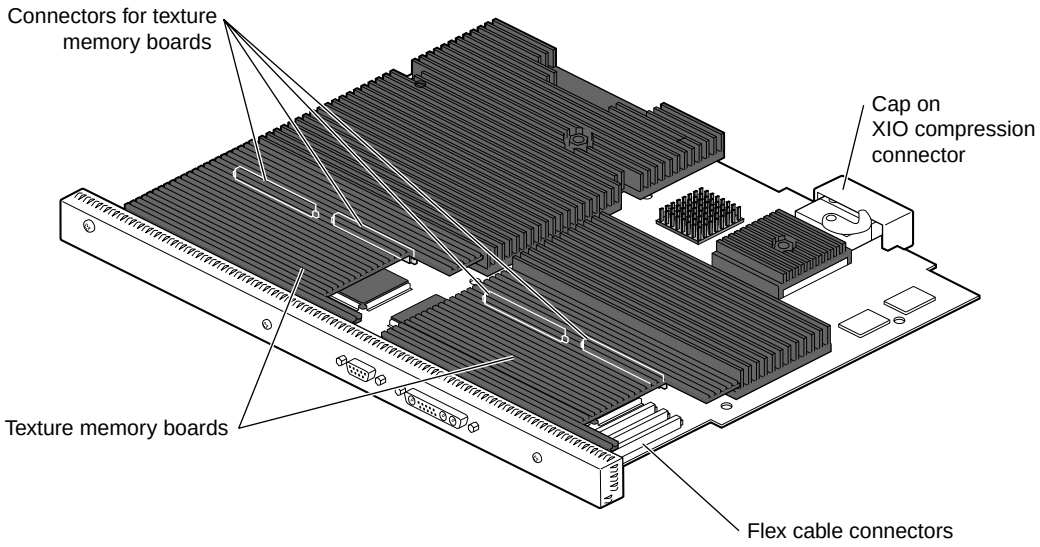

Figure C-4 OCTANE/MXI Graphics Board

Back of Workstation

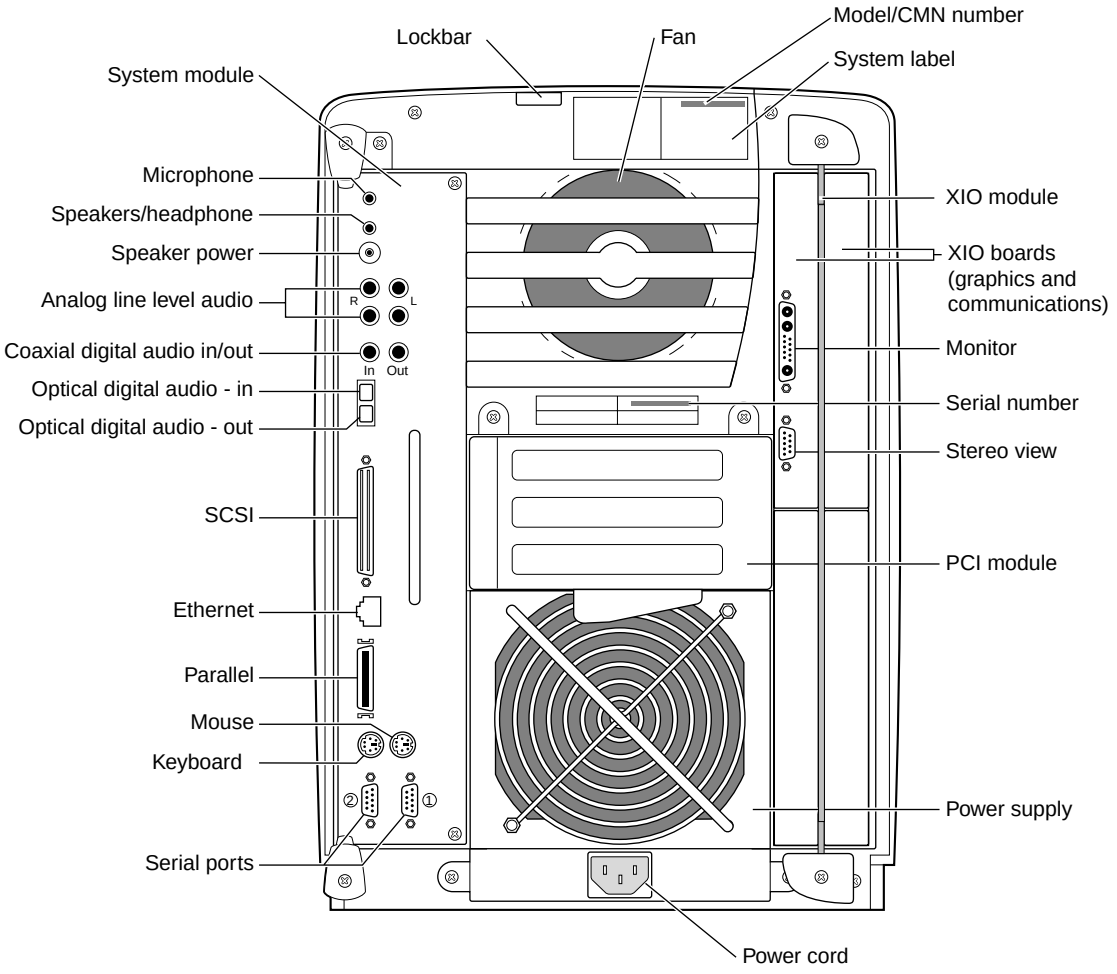

Figure C-5 Back of Workstation

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