OCTANE™ IRIS® 4-Port Fast Ethernet Adapter
With Asynchronous Serial XIO Board
Installation Guide

CONTRIBUTORS

Written by Carlin Otto and Charmaine Moyer
Illustrated Martha Levine
Production by Mike Dixon
Engineering contributions by: Rob Novak, Dave Olson, Pearl Park, Brad Reger, Jose
 Reinoso, Richard Wright
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.*

OCTANE™ IRIS® 4-Port Fast Ethernet Adapter With Asynchronous Serial XIO
Board Installation Guide
Document Number 007-3582-001

Contents

List of Figures

List of Tables

About This Guide

This guide provides you with information about the features of the IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial XIO (MENET/MSER) board for the OCTANE workstation and explains how to install, remove, and configure it.

The Fast Ethernet option board provides up to four additional external Ethernet and six additional serial ports for the OCTANE workstation. Features include:

- Each Ethernet port auto-negotiates to operate at either 10 megabits per second (10-Base-T) or 100 megabits per second (100-Base-T).

- An IRIS Fast Ethernet port, if used, must be connected to an Ethernet port on a hub, switch, or host.

- Each asynchronous serial port can operate with RS-232-style signals or Apple Macintosh-style signals; each serial port can operate at up to 460 Kbaud.

- All the serial ports the OCTANE workstation (including the ports on this board) function as data terminal equipment (DTE).

- An asynchronous serial port can be connected only to an asynchronous peripheral device or to itself via a loopback cable (for testing purposes) to another port on the same board.

- The Ethernet and serial ports use the same software drivers as those built into the OCTANE workstation. They have identical functionality.

- The maximum number of MENET/MSER XIO boards that can be installed into an OCTANE workstation with an OCTANE/SI graphics board is three, or two in a system with OCTANE/SSI or /MXI graphics boards.

Below is an overview of the contents of this guide.

- The introduction provides information about hardware resources, products, and support.

- Chapter 1 provides information about installing the MENET/MSER option board.

- Chapter 2 provides instructions for configuring and cabling the MENET/MSER option board.

- Chapter 3 provides information on removing the MENET/MSER option board.

- Chapter 4 provides troubleshooting information.

- Appendix A provides illustrations of the IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial XIO option board, and the OCTANE/SI, OCTANE/SI with texture memory option board, OCTANE/SSI, and OCTANE/MXI graphics boards.

- Appendix B provides instructions on the care and cleaning of the XIO compression connector.

Read this guide once all the way through before you start to work. You will become familiar with the OCTANE system and the parts with which you will be working.

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, do so now. For instructions on backing up your system, see the online *Personal System Administration Guide*.

Related Documentation

Administration for the IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial board's ports and interfaces is described in the online documents *Personal System Administration Guide, IRIX Admin: Networking and Mail,* and *IRIX Admin: Peripheral Devices*.

See the online documentation that shipped with your system for any configuration or programming guides related to the IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial XIO board. When looking for a configuration or programming guide, look or a title similar to that of the board protocol name.

Check the release notes for any additional information.

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

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

Software and System Administration Information

For complete information on installing software, see the online *Personal System Administration Guide*. You can find it on your desktop by choosing Toolchest > Help > Online Books. For more advanced information, see the online *IRIX Admin: Software Installation & Licensing Guide*. For system administration information, see the SGI_Admin section of the online bookshelf.

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/`

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`

Product Support

The OCTANE workstation is designed so that you can maintain and repair it 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.

Installing the IRIS 4-Port Ethernet Adapter With Asynchronous Serial XIO Option Board

The IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial XIO board (MENET/MSER option board) for the OCTANE workstation provides four Ethernet and six asynchronous serial port expansion capability for the OCTANE workstation. It can be installed in any slot on the OCTANE workstation's XIO module that is not occupied by XIO graphics boards.

The following topics are covered in this chapter:

- "Installing the Software" on page 2.
- "Checking Ethernet Option Board Package Components" on page 3.
- "Checking the Version of the Xbow Chip" on page 3.
- "Preparing the Workstation" on page 4.
- "Removing the XIO Module" on page 8.
- "About the XIO Module" on page 14.
- "Attaching the Ethernet Option Board to the XIO Module" on page 14.
- "Replacing the XIO Module" on page 18.
- "Placing a Regulatory Label" on page 23.

About the IRIS 4-Port Ethernet Adapter With Asynchronous Serial XIO Board

- Each Ethernet port auto-negotiates to operate at either 10 megabits per second (10-Base-T) or 100 megabits per second (100-Base-T).
- An IRIS Fast Ethernet port, if used, must be connected to an Ethernet port on a hub, switch, or host.
- Each asynchronous serial port can operate with RS-232-style signals or Apple Macintosh-style signals; each serial port can operate at up to 460 Kbaud.

- All the serial ports the OCTANE workstation (including the ports on this board) function as data terminal equipment (DTE).

- An asynchronous serial port can be connected only to an asynchronous peripheral device or to itself via a loopback cable (for testing purposes) to another port on the same board.

- The Ethernet and serial ports use the same software drivers as those built into the OCTANE workstation. They have identical functionality.

- The maximum number of MENET/MSER XIO boards that can be installed into an OCTANE workstation with an OCTANE/SI graphics board is three, or two in a system with OCTANE/SSI or /MXI graphics boards.

Installing the Software

Before shutting down your system and installing the MENET/MSER board, be sure you have the current version of the IRIX operating system installed on your system. Install the operating system that came with your board before installing the hardware.

Read the flier and install the MENET/MSER software that came with your shipment. Also read any release notes and the notes in the CD booklet for detailed information about the software. To review release notes, choose Toolchest > Help > Release Notes. Release notes are available here after the software has been installed.

To display ASCII text in an IRIX shell, at the prompt, enter `cdrelnotes`.

Checking Ethernet Option Board Package Components

Cap on XIO compression connector

Wrist strap

MENET/MSER option board

Reversible screwdriver

Documentation

CDs
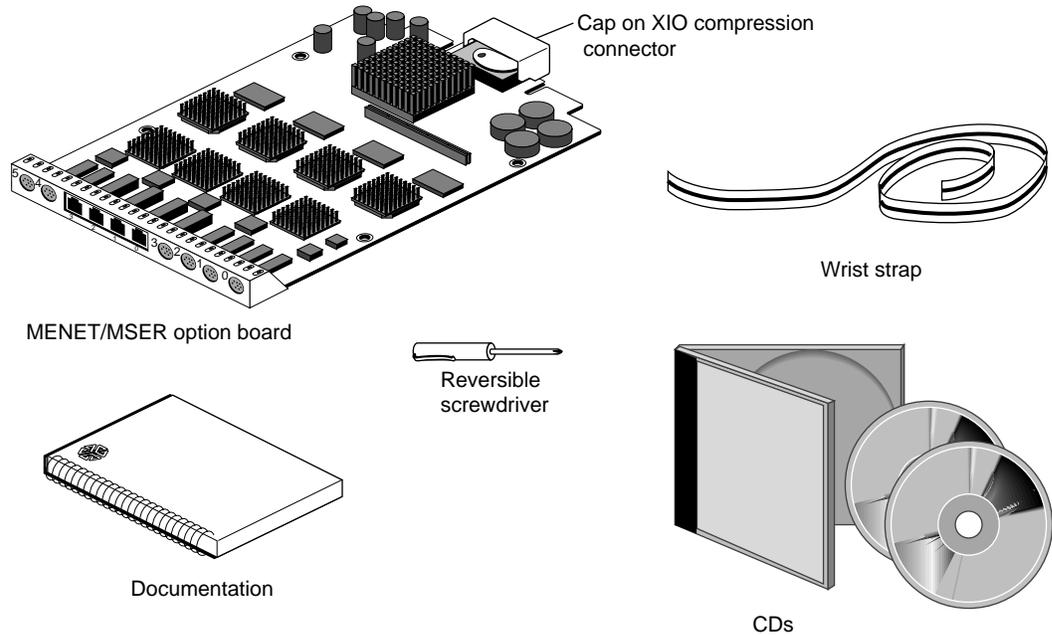
Figure 1-1   Checking the MENET/MSER Option Board Shipment

It's a good idea to check your shipment when you receive it. You should receive the supplies shown in Figure 1-1.

Checking the Version of the Xbow Chip

A 1.3 (or later) version of the xbow chip (located on the frontplane) is required for use with the MENET/MSER option board. Follow these instructions to determine if the OCTANE workstation has a 1.3 or later version of the xbow chip, and if not, for information on ordering this no-cost upgrade.

Read these instructions before following them. The system powers on very quickly.

1. Open the front cover and push to the power button to power off the OCTANE workstation.

2. When the system has powered off, push the power button and power on the OCTANE workstation.

3. When the System Startup Notifier appears, click the *Stop for Maintenance* button, or press the Escape key.

4. Click the Enter Command Monitor icon.

5. At the prompt, type `system`.

You will see a response similar to the following:

```
% system
IP30
--
Chips/NICs:
--
xbow(rev1.2)
```

(This example shows an xbow chip that needs to be upgraded.)

The line beginning with xbow tells you which version of the xbow chip is in the workstation. If you have rev1.2, call your authorized Silicon Graphics service provider to request the no-cost upgrade. In the United States call 1800-800-4SGI. A Silicon Graphics service engineer performs the upgrade, due to the complexity of the task.

6. Click *Done.*

7. Click the Start System icon.

You are finished checking for the xbow revision number.

Preparing the Workstation

Installing an MENET/MSER option board requires that you completely shut down the system and protect yourself and the system by attaching the wrist strap.

Shutting Down the Workstation
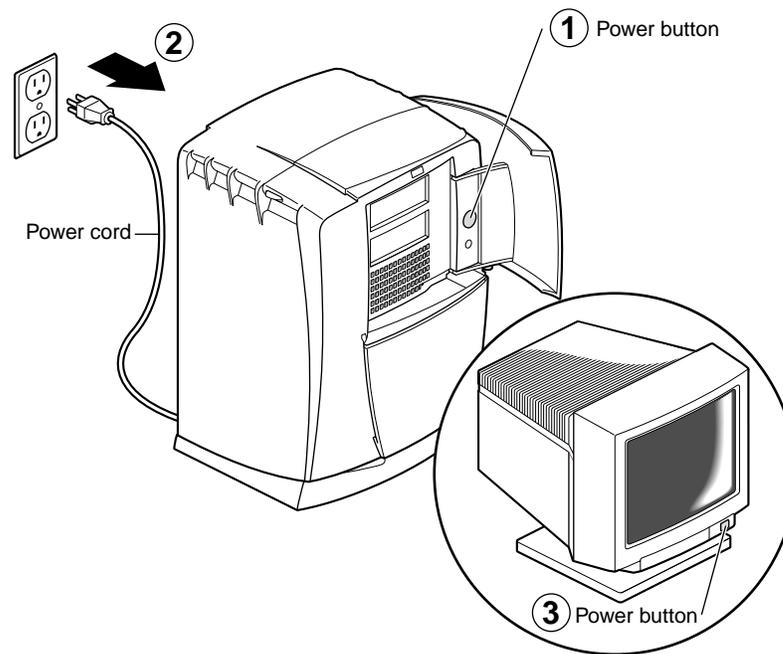
Figure 1-2   Powering Off the OCTANE Workstation

1.   Open the cover and push the power button to power off the OCTANE workstation.

2.   Unplug the power cord.

3.   Push the power button on the monitor to power it off. Wait five minutes.

4.   Face the rear of the workstation.

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.**

5
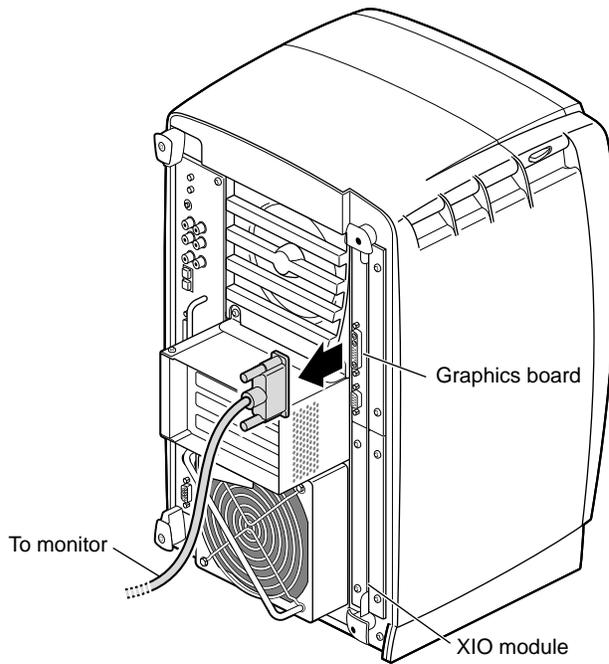
Figure 1-3   Removing the Monitor Cable

5.   Remove the monitor cable and other cables from the XIO module. (For illustration purposes, only the monitor cable is shown in Figure 1-3.)

The XIO module can be thought of as a tray to which the XIO graphics boards and option boards are attached.

Note: The XIO module is always installed with the graphics board toward the top of the workstation, in the upper left quadrant. See Figure 1-3.

Attaching the Wrist Strap
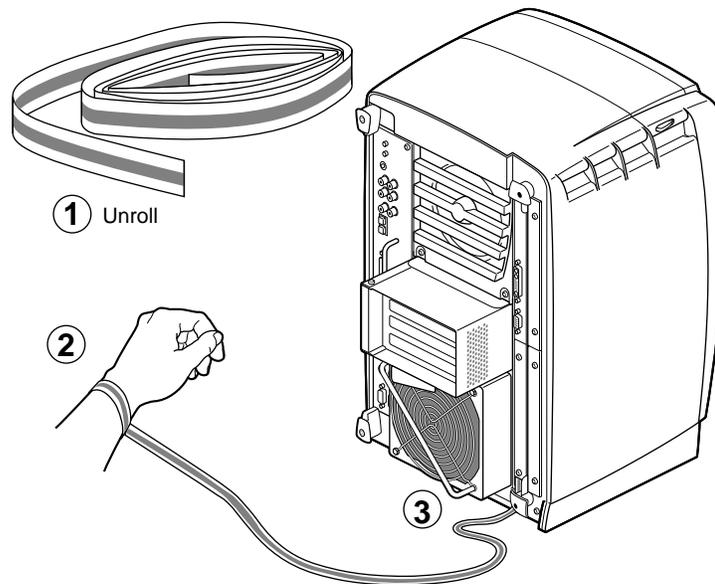
Figure 1-4   Attaching the Wrist Strap

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.

To attach the wrist strap, follow these steps:

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 a convenient and exposed electrical ground, such as a metal part of the OCTANE workstation.

7

Removing the XIO Module

Before removing the XIO module, you must power off the OCTANE workstation, wait five minutes to allow the heat sinks to cool, and attach the wrist strap. If you have not already done this, go to "Preparing the Workstation" on page 4 and follow the instructions through attaching the wrist strap. Then return here.

Bristled pad
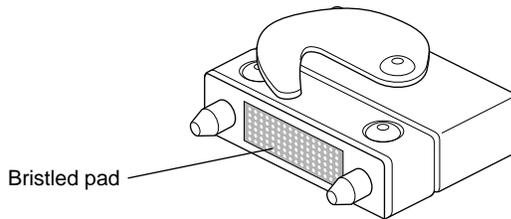
Figure 1-5   Identifying the Compression Connector

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, as do most XIO option boards. The MENET/MSER option board has a compression connector.

Caution: The compression connectors on XIO boards are very delicate and easily damaged. Do not touch or bump the gold, bristled pad. For more information on care and cleaning of compression connectors, see "Guidelines for Storing and Handling the Compression Connector" on page 58.
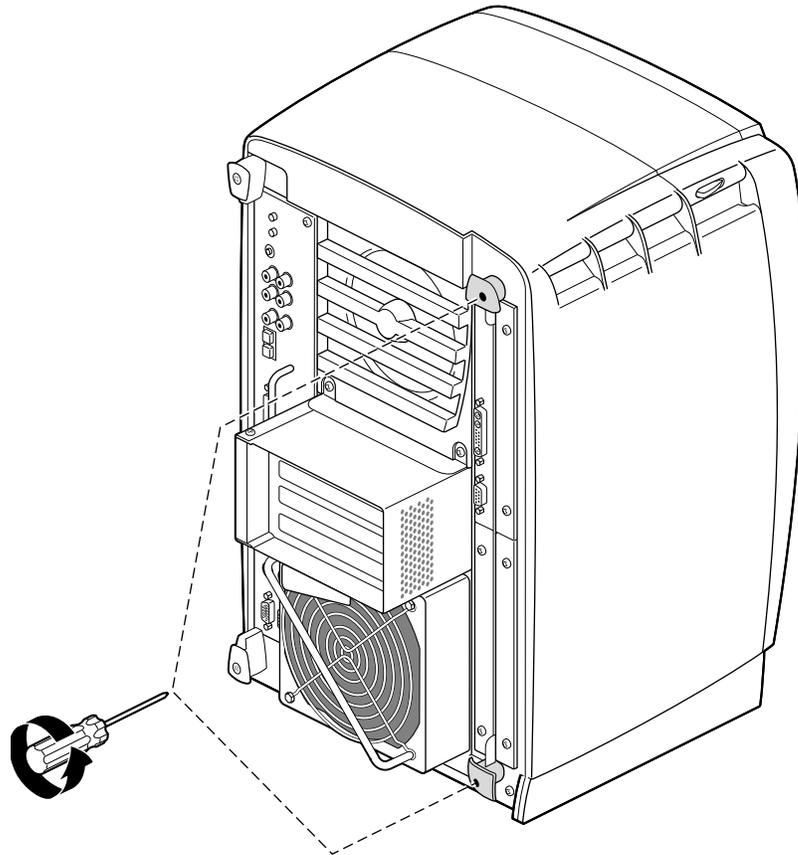
Figure 1-6 Removing the XIO Module Screws

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.**

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

1. Loosen the two captive screws in the XIO module handles until the handles move free from the workstation.

9
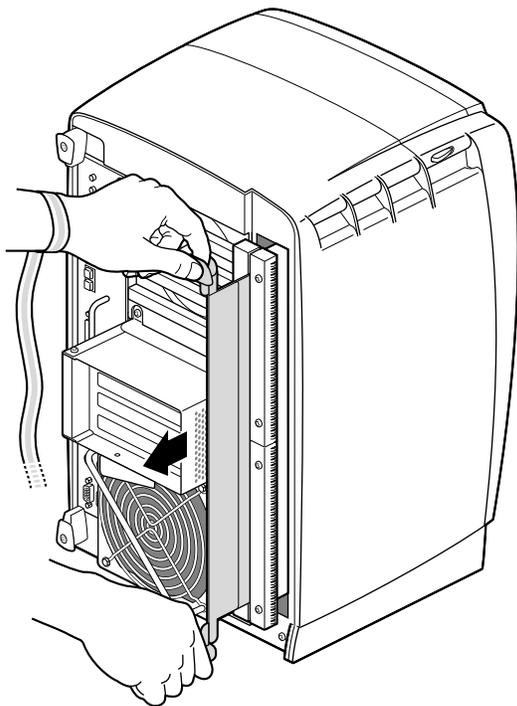
Figure 1-7   Removing the XIO Module

2. Grasp the handles and pull until the XIO module protrudes a couple of inches from the chassis.

    The handles and the XIO module move out about two inches before the I/O panels move.
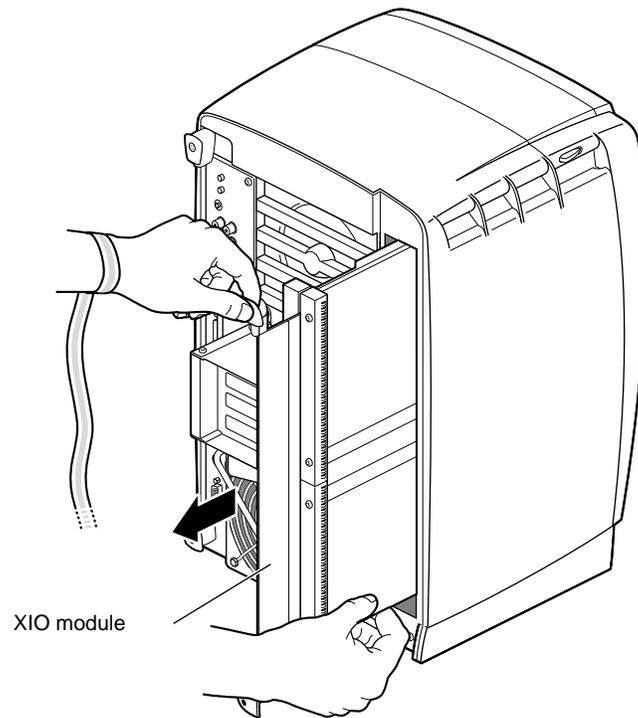
XIO module

Figure 1-8   Supporting the XIO Module

3. Grasp the XIO module along its length, and support the module and XIO boards as you remove them from the chassis.
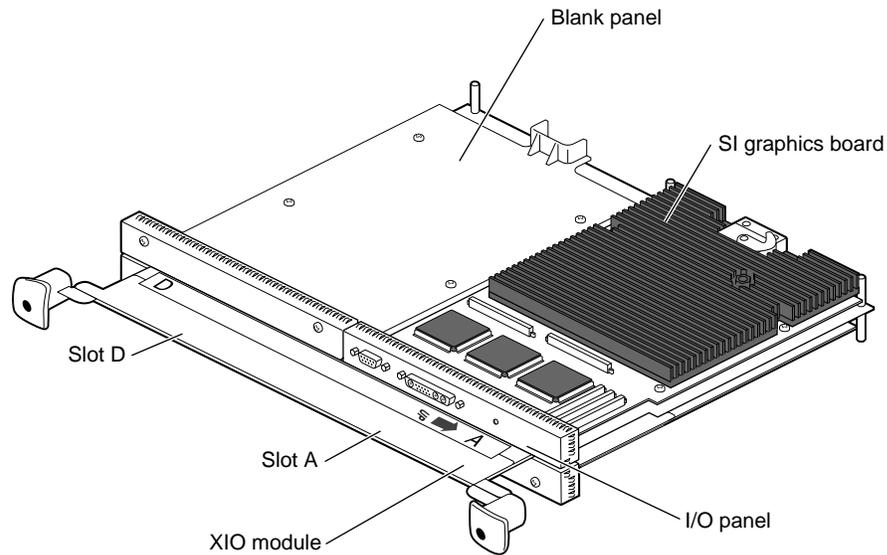
Figure 1-9   Placing the XIO Module on Its Side

The handles protrude from beneath the XIO boards when the XIO module is out of the chassis. When the handles protrude, the identification slots for the XIO boards (D and A, B and C) are visible. Slots B and C are on the opposite side of the XIO module from slots D and A.

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.

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

Note: Figure 1-9 above shows and OCTANE/SI graphics board in slot A and blank panel in slot D. OCTANE/SSI or /MXI graphics are twice the width of the OCTANE/SI board and reside in slots D and A, although these boards connect to the workstation through the single compression connector on the slot A side of the board. See Appendix A for illustrations of various graphics boards and the MENET/MSER option board.

Caution: Do not touch
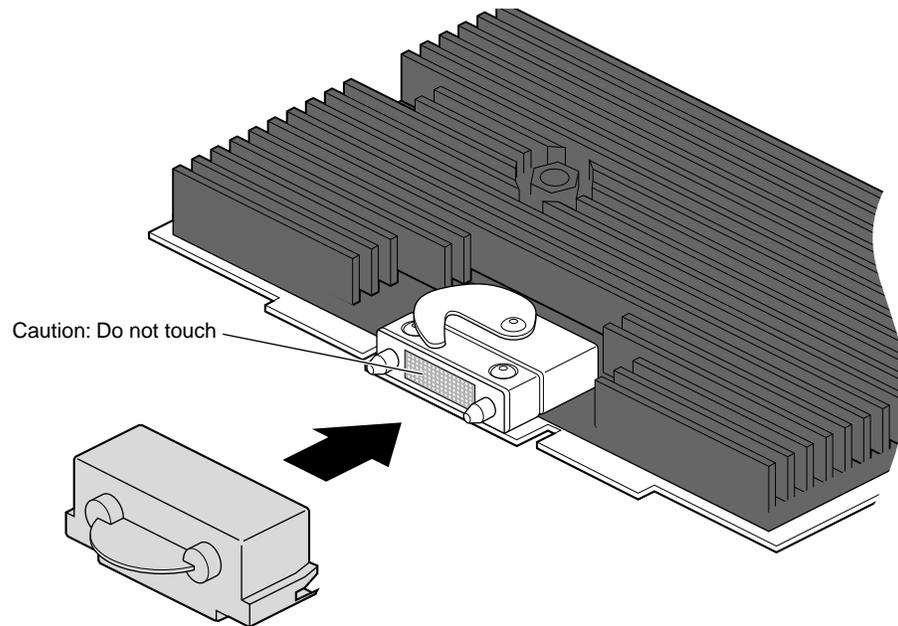
Figure 1-10   Placing a Protective Cap on the XIO Compression Connector

5. Place a cap on the XIO graphics board compression connector.

    Note: The cap prevents damage to the gold (front) surface when the XIO boards are removed from the workstation. These caps are placed on any XIO 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.

About the XIO Module

The XIO module is the holding mechanism for XIO graphics and 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 XIO module must be placed so that the graphics board in slot A is in the upper left corner, or the graphics board may overheat and be damaged.

- The graphics board is always in slot A or slot A and (covering) slot D.

- 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.

- A baffle must be attached to two side-by-side blank panels to ensure proper airflow.

- The XIO compression connector is always covered by a protective cap when an XIO board is out of the OCTANE workstation. Extra caps for the compression connectors are shipped with the workstation.

Attaching the Ethernet Option Board to the XIO Module

Attaching the MENET/MSER option board is a lengthy process. Here is a quick overview of the preliminary steps.

Before installing the MENET/MSER option board, you must follow a series of steps detailed in the preceding sections of this chapter, beginning on page 1. If you have not already done so, go to page 1 and follow the instructions through removing the XIO module. If you have already removed the XIO module, go to step 1 on the next page. (Be sure you also read "About the XIO Module" before beginning your task.)

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 XIO Compression Connector."
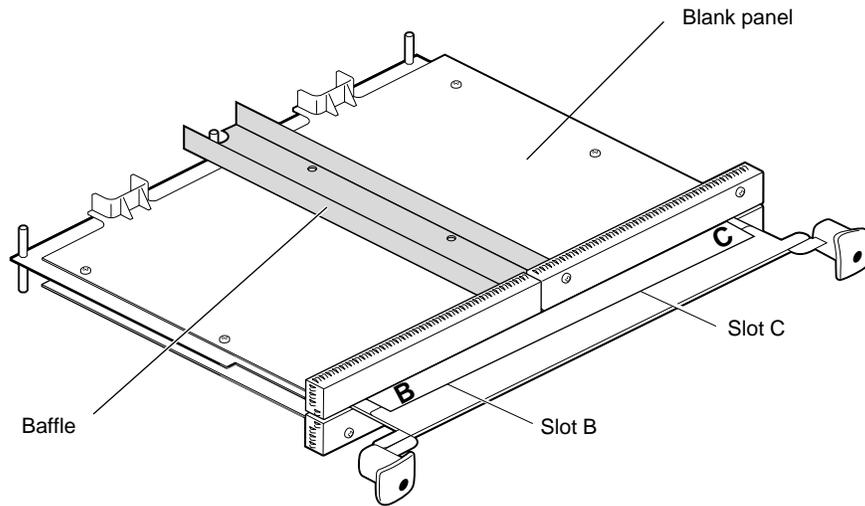
Figure 1-11   Identifying the Baffle and Blank Panel

1.   Turn the XIO module so that slots B and C are facing you. Select your next step from the task list below.

If You Have...	Go to...
An option board in the slot in which you want to install the MENET/MSER option board.	The option board installation guide for instructions on removing the board.
A blank panel and an option board, or an SI graphics board and blank panel, in side-by-side slots.	Step 3.
Blank panels in slots B and C.	Step 2.
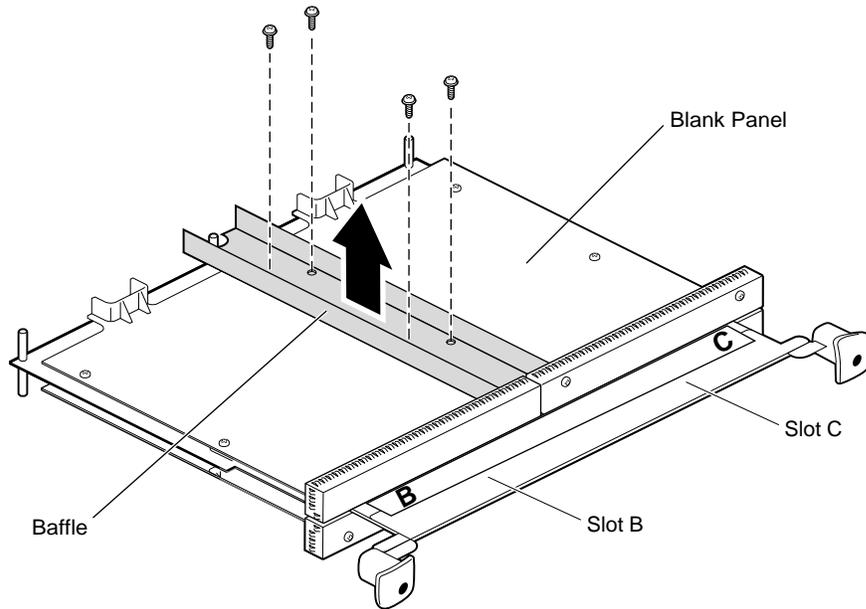
Figure 1-12   Removing the Baffle

Note: For illustration purposes, in this manual, the MENET/MSER option board is shown in slot C.

2. Remove the baffle attached to the two blank panels:

    ■   Using a Phillips screwdriver, remove the four screws holding the baffle to the two blank panels.

    ■   Remove the baffle.

    ■   Replace the two screws into the blank panel that stays on the XIO module.

3. Remove the four (or remaining) screws from the blank panel you are removing.

4. Remove the blank panel. Keep it in case you remove an option board. A blank panel or board must be in place in each slot on the XIO module.

5. Keep the baffle. The baffle must be in place over two blank panels to ensure proper airflow.

    Note: The baffle is never used with an option board, only with two side-by-side blank panels.
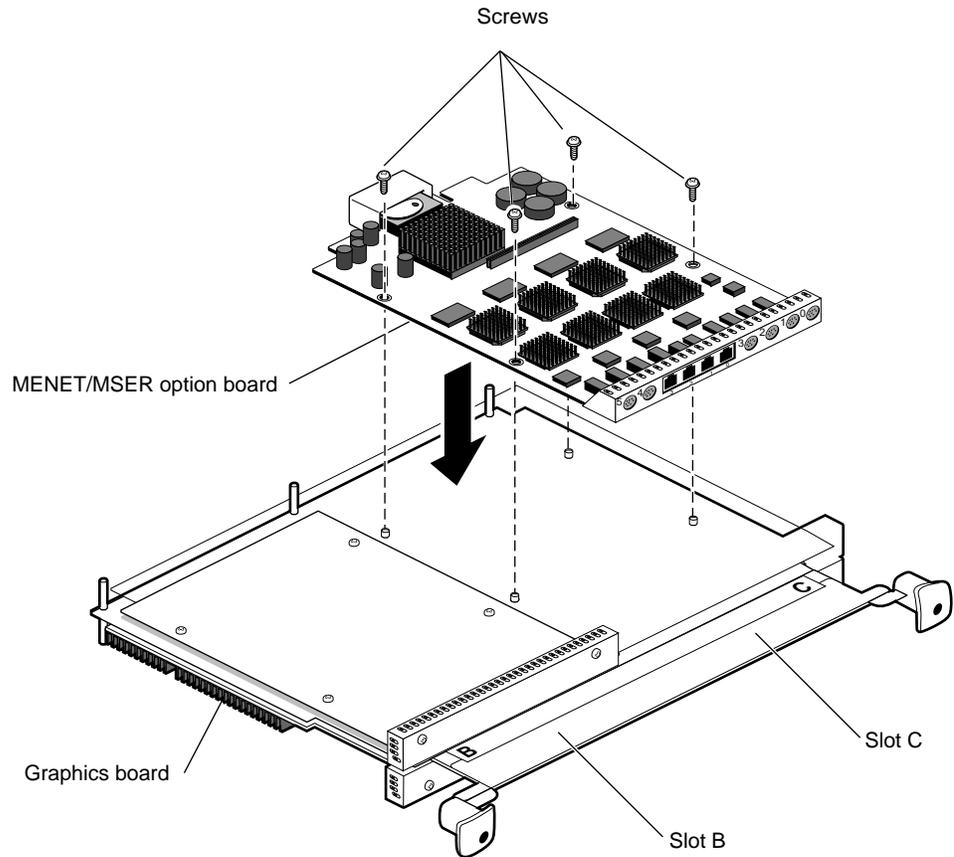
Figure 1-13   Attaching the MENET/MSER Board to the XIO Module

6. Place the MENET/MSER option board on the XIO module, aligning the holes in the board to the standoffs on the XIO module.

7. Insert and tighten four screws through the MENET/MSER board and into the standoffs on the XIO module.

8. Remove the cap from the compression connector.

Caution: Do not install the baffle. The baffle is used only with two side-by-side blank panels.

Go to page 18 for instructions on replacing the XIO module.

Replacing the XIO Module

OCTANE SI/SI

OCTANE SSI or MXI/SI
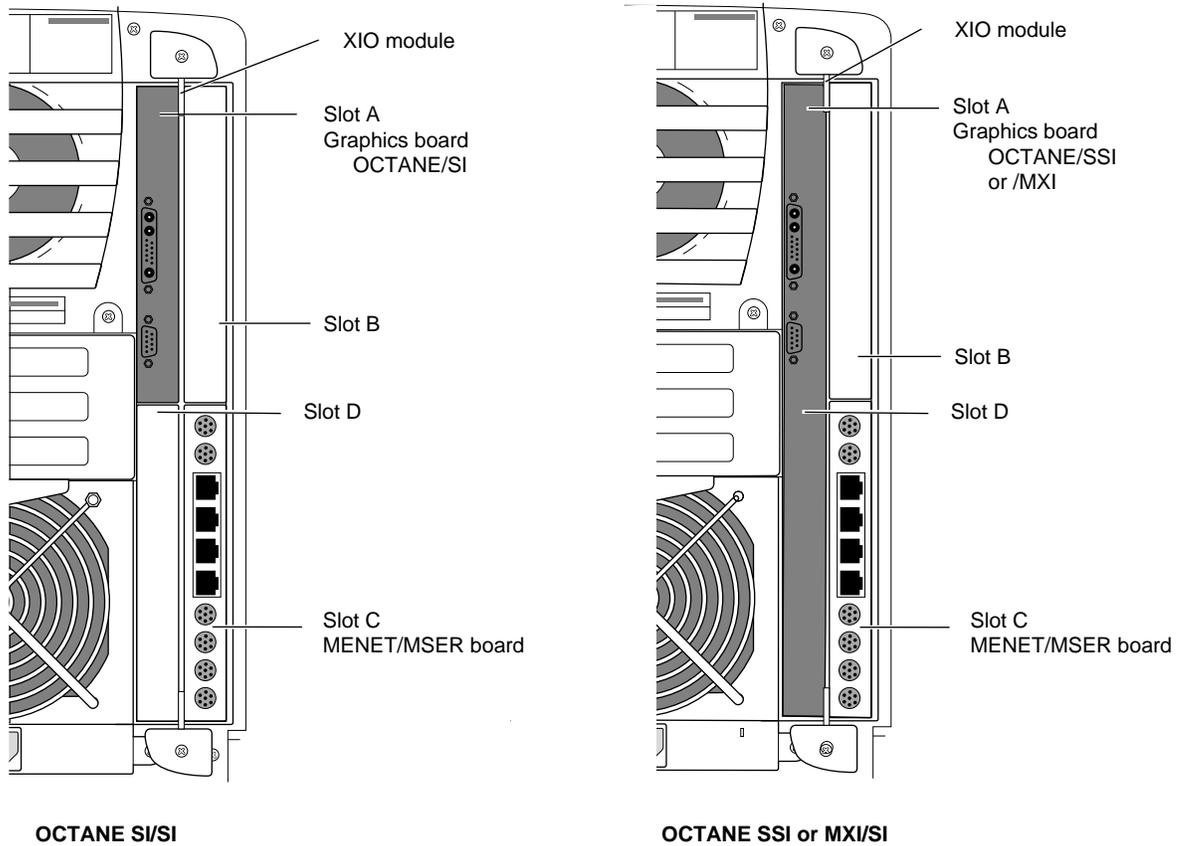
Figure 1-14   Installing Slots A and D Toward the Interior of the OCTANE Workstation

Caution: The XIO module must be replaced with the graphics board toward the top of the workstation to prevent overheating and damage to the boards. If the XIO module with the OCTANE/SSI or OCTANE/MXI graphics board is inserted incorrectly, a notifier appears during power on telling you to insert the XIO module with the graphics boards toward the interior of the workstation, and power-on stops. Power off the system and correctly insert the XIO module as shown in Figure 1-14.
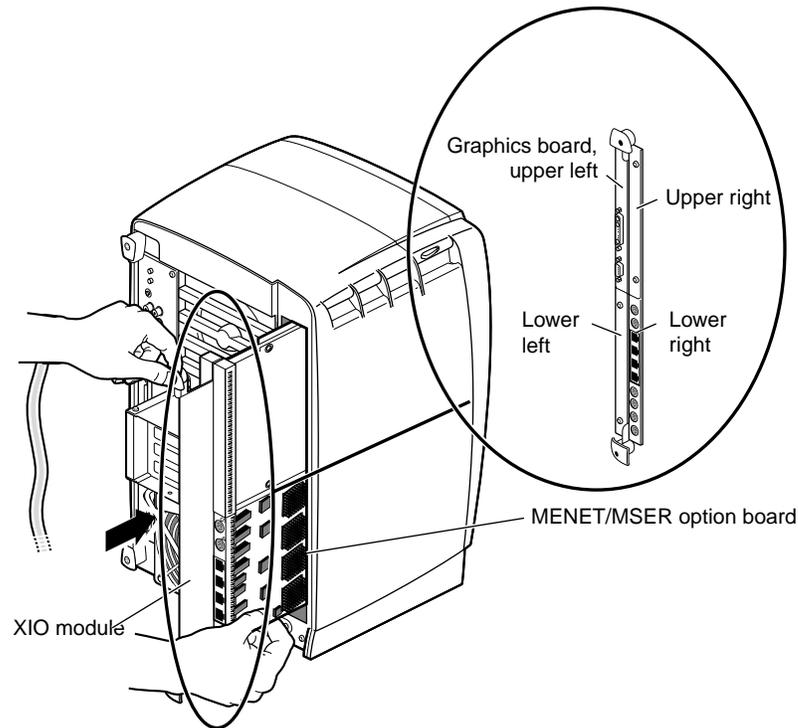
Figure 1-15   Replacing and Orienting the XIO Module

Follow these steps to replace the XIO module:

1. Replace and orient the XIO module in the OCTANE workstation. Slide the XIO module into guides on the top and bottom of the workstation, with the graphics board oriented to the upper left. See Figure 1-15.

2. Before you insert the XIO module, make sure the handle portion protrudes from the I/O panels, as shown in Figure 1-15.

    If the handles are flush with the I/O panels, the XIO module will stop during insertion. Pull out the handles until the sliding portion of the XIO module looks like that shown in Figure 1-15, and then continue inserting the XIO module.

3. Use the handles to push the XIO module into a locked position.

    Note: The I/O panels are not completely flush with each other or the chassis; there is some slight variation in the depth of the individual boards.
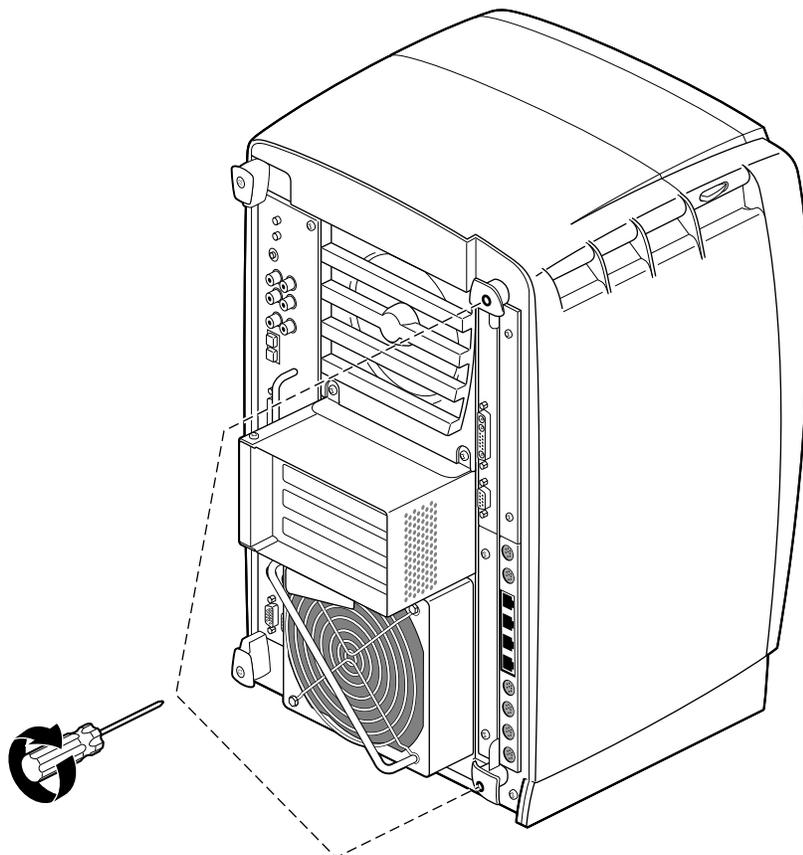
Figure 1-16   Replacing the XIO Module Screws

4. Tighten the screws in the handles so that the XIO module is attached to the chassis.

5. Remove the wrist strap.
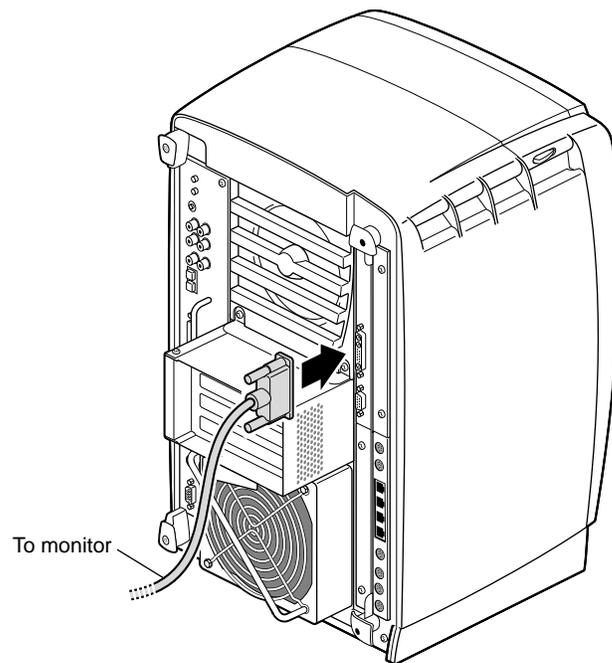
Figure 1-17   Replacing the Monitor Cable

6.   Reattach the monitor cable to the I/O connector.

You have finished replacing the XIO module and are ready for the next step. Go to "Powering On the OCTANE Workstation" on page 22.

Powering On the OCTANE Workstation
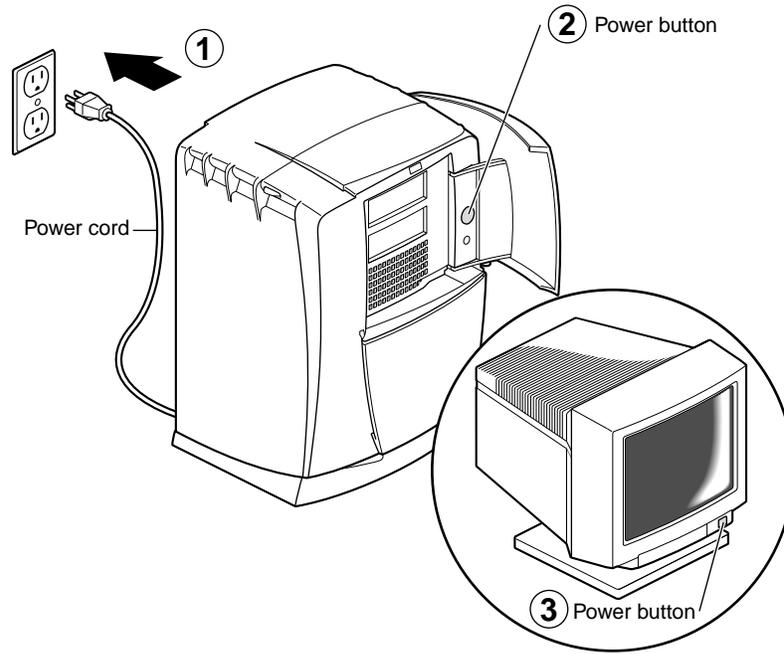
Figure 1-18   Powering On the OCTANE Workstation

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 button on your monitor.

Go to the next section for instructions on placing any upgrade label, and then go to Chapter 2 for instructions on configuring the MENET/MSER board and installing the cables.

Placing a Regulatory Label
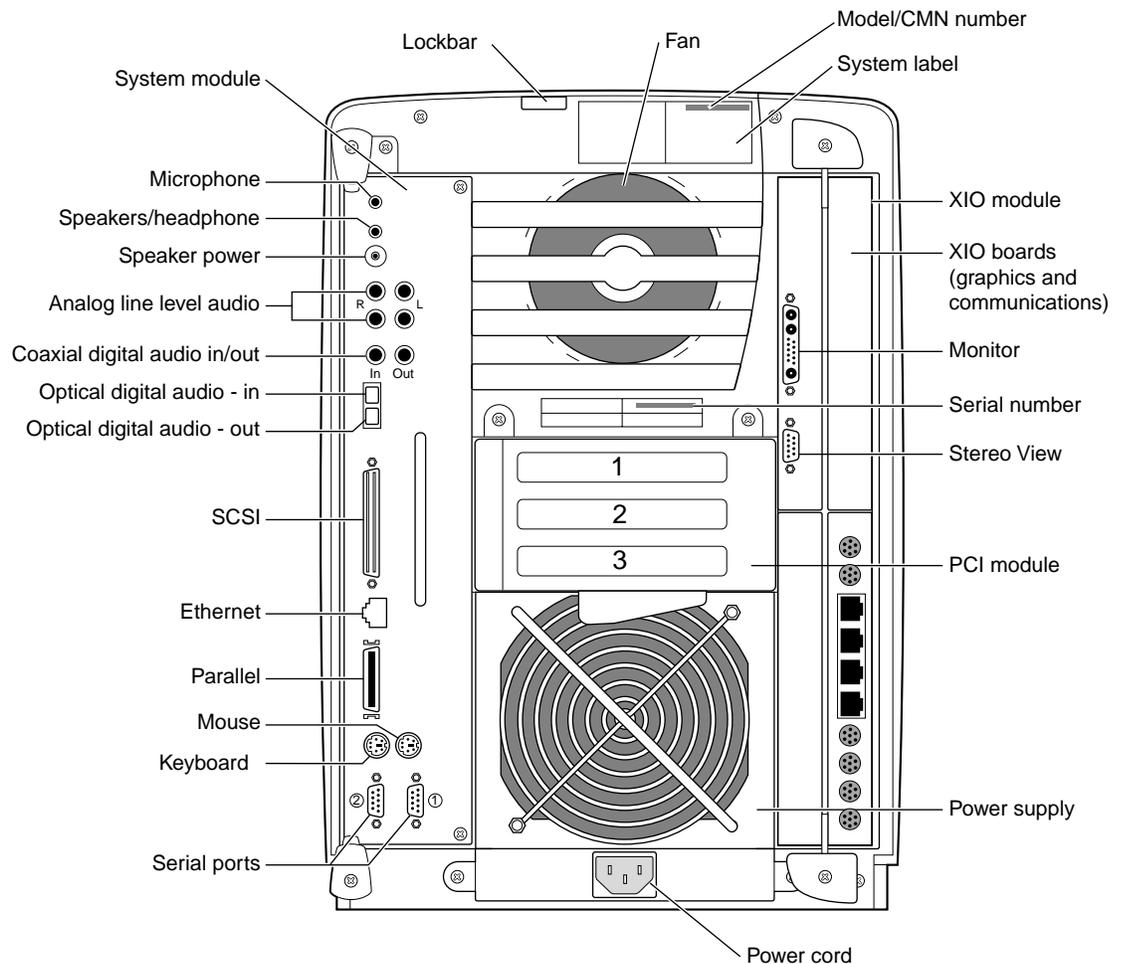
Figure 1-19   Rear View of the OCTANE Workstation

If you received a system upgrade label, place it on the system label (top of workstation).

1. Face the back of the OCTANE workstation. The system label (model/CMN number, VCCI, CISPR 22 data) is located at the top center of the back of the workstation.

2. Place the label over the VCCI and CISPR 22 information.

Returning Parts

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

Configuring and Cabling the IRIS 4-Port Ethernet Adapter With Asynchronous Serial XIO Option Board

After installing the MENET/MSER option board, you need to configure the software and install the cables.

The following topics are covered in this chapter:

I/O Panel and LEDs

Figure 2-1   I/O Panel and LEDs for MENET/MSER XIO Board

The I/O panel has four Ethernet ports labeled **0**, **1**, **2**, **3** and six asynchronous serial ports labeled **0**,**1**, **2**, **3**, **4**, **5**. Sticky labels can be placed on the panel plates to indicate the specific network interface or peripheral device that has been assigned to each port.

Two square LEDs are immediately adjacent to each RJ-45 Ethernet connector: one yellow and one green. When the yellow LED is ON, the port is receiving data. When the green LED is ON, the port is transmitting data.

Serial Port Compatibility Issues for MENET/MSER XIO Board

The MENET/MSER option board's female mini-DIN8 connectors are exactly like the ones used on Silicon Graphics Indigo², Indigo, Origin200, and Indy chassis. The serial ports on the OCTANE chassis are male DB9. Should you need a mini-DIN8 to DB9 adapter cable, see "Asynchronous Serial Cable Requirements and Port Pinouts" on page 27.

For more information on serial ports, see the serial man pages. To access man pages from the Toolchest, choose Help > Man Pages and enter **7 serial** in the search window. From a UNIX shell, enter **man 7 serial**.

Cable Requirements

This section lists cable requirements and includes the descriptions of external cables for the IRIS MENET/MSER XIO board.

Ethernet Cable Requirements

The MENET/MSER XIO board provides four RJ-45 receptacles in the board's I/O panel plate. To activate Ethernet functionality on a port, the port must be connected to one of the following: an Ethernet switch, an Ethernet hub, or an Ethernet endpoint (host). (In all these scenarios, operation also depends on appropriate IP address and netmask configuration.) Each port can be connected to either a 10-Base-T (10 Mbps) or 100-Base-TX (100 Mbps) network; each port independently auto-negotiates for operation at the correct speed for its physical attachment.

The site's connectors, splices, cabling, and the installation of the cabling must conform to the guidelines described in the physical layer standard for the speed used on the local area network. For example, the physical layer specification for 10-Base-T specifies category 3 unshielded twisted pair cable or better (CAT 3 UTP), while the standard for 100-Base-TX specifies either 2-pair category 5 (also known as CAT 5 UTP) unshielded twisted pair or 2-pair shielded twisted pair cabling. The relevant standards documents are *Document #802.3u: MAC Parameters, Physical Layer, Medium Attachment Units and Repeater for 100Mb/s Operation, Supplement to 1993 version of ANSI/IEEE Standard 802.3* and *Document #802.3: ANSI/IEEE 802.3 Standard*.

Asynchronous Serial Cable Requirements and Port Pinouts

The MENET/MSER XIO board provides six mini-DIN8 female serial connectors. To use an asynchronous serial port, the port must be connected to a serial device (for example, an RS-232 or RS-422 device, such as a terminal, a printer, or a modem) with an appropriate cable. For testing, the port can be connected to another serial port or looped back to itself with a null-modem cable. Figure 2-2 illustrates the pinout for the mini-DIN8 receptacles; Table 2-1 describes the function/signal assigned to each pin.
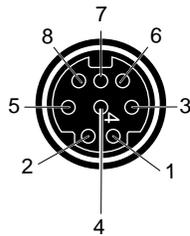
Figure 2-2   Pin Numbering for Mini-DIN8 Serial Port Panel Plate Connectors on
MENET/MSER XIO Board

Table 2-1   Signal Assignment for Serial Ports on MENET/MSER XIO Board

Pin	RS-232-Style Signals		AppleTalk-Style (RS-422) Signals		Flow (From Board)
1	DTR	data terminal ready	HSKo	handshake output	output
2	CTS	clear to send	HSKi	handshake input	input
3	TXD	transmit data	TXDA-	transmit data	output
4	GND	signal ground	GND	signal ground	n.a.
5	RXD	receive data	RXDA-	receive data	input
6	RTS	request to send	TXDA+	transmit data	output
7	DCD	data carrier detect	not used[a]		input
8	not used[b]		RXDA+	receive data	input

a. The general purpose input (GPI) or ring indicator (RI) signal is not supported.

b. The data set ready (DSR) signal is not supported.

DIN8

1, DTR
2, CTS
3, TXD
4, GND
5, RXD
6, RTS
7, DCD
8, no signal

Male pinout

Male pinout

DB9

4, DTR
8, CTS
3, TXD
5, GND
2, RXD
7, RTS
1, DCD
6, no signal
9, no signal
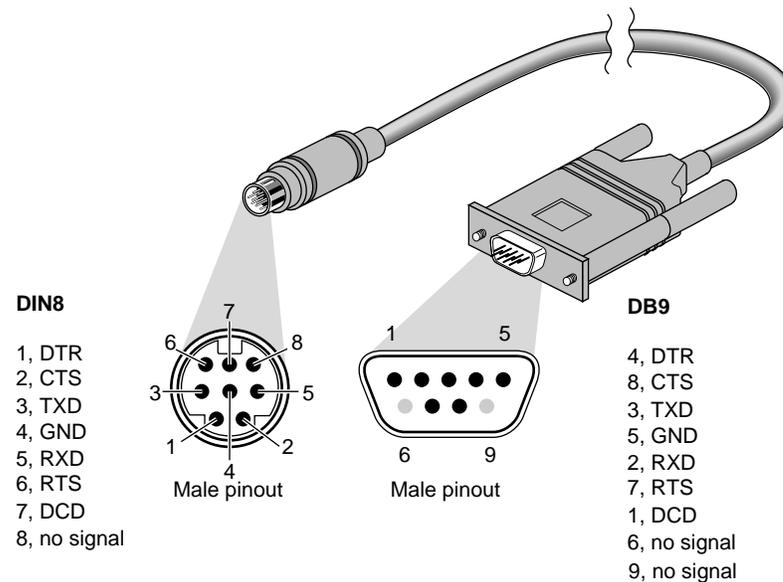
Figure 2-3   6-Inch Mini-DIN8 to Male DB9 Adapter Cable

To convert the mini-DIN8 connectors on the board to DB-9 connectors (with MAC-style or PC/AT-style pinouts), straight-through and crossed (null-modem) adapter cables can be ordered directly from Silicon Graphics. Contact your local sales representative.

- 6-inch male mini-DIN8 to male DB9 adapter cable assembly
  This cable converts a MSER port to a male DB9 connector with PC/AT-style and MAC-style DTE pinout and signal assignment. When attached to an MSER port, this cable presents a point of attachment that is exactly like the DB9 serial ports on the Silicon Graphics OCTANE system module, O2, and Origin200 chassis. This adapter cable is intended for attaching data communications equipment (DCE) devices that have a female DB9 connector. See Figure 2-3.

- 10-foot null-modem male mini-DIN8 to female DB9 cable assembly
  This cable presents a female DB9 connector with crossed (null-modem) PC/AT-style or MAC-style signals. This adapter cable is used to attach data terminal equipment (DTE) devices that have a male DB9 connector.

Configuring the MENET/MSER Software

The IP network interface for the MENET 10-Base T and 100-Base-TX ports is *ef#*. The Ethernet driver and configuration files are included in the *eoe.sw.unix* and *eoe.sw.tcp* images. Interface identification numbers are assigned by *ioconfig* during bootup. See the ioconfig(1) man page.

Follow the configuration instructions in Chapter 3 of the *Personal System Administration Guide* to configure the software (IRIX drivers) and the IP network interface for each IRIS Ethernet port (*ef#*).

Note: A system with two or more network connections is automatically considered a router (for example, *routed* automatically operates) and IP network interfaces are created; however, configuration of these interfaces does not occur automatically.

Ethernet and Fast Ethernet IP network interfaces (that is, *ef0*, *ef1*, and so on) are assigned to Ethernet ports in the following manner:

- *ef0* is assigned to the Ethernet port on the OCTANE system module.

- Subsequent Ethernet ports are assigned numbers during the boot phase by the *ioconfig* utility. The numbers assigned to the ports on the MENET board are usually, but not always, sequential; see the ioconfig(1) man page.

For information about using and configuring the various serial communication signaling styles for the ports on this board, see the online serial(7) man page, or the *Personal System Administration Guide*, Chapter 3.

About the ioconfig.conf File

The *ioconfig.conf file* records and saves option board and port information after the board is installed in the OCTANE workstation. However, the file reserves the board and port spaces if the option board is removed, and begins assigning new ID numbers when a new board is inserted. For example, if a board was in quadrant B (11) then removed, and another MENET/MSER board placed in quadrant C (9), the file would begin numbering for the new board beginning with the next number after the last used for the previous board in quadrant B (11). This reporting pattern is desirable under some circumstances.

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

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

To view the ioconfig.conf file, follow these steps:

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

2. At the prompt, enter: `cat /etc/ioconfig.conf`

   You see a listing similar to the example in Table 2-2. The columns are described in the sections following the table.

Table 2-2   Identification of Information in the ioconfig.conf File

Logical Controller Number	Hardware	Node	XIO (xtalk) Bus Type	Physical ID	PCI Bus Type	Bus ID	Port Type (Abbreviation)	Serial Port ID
2	/hw	/node	/xtalk	/10	/pci	/0	/ef	
3	/hw	/node	/xtalk	/10	/pci	/1	/ef	
4	/hw	/node	/xtalk	/10	/pci	/2	/ef	
5	/hw	/node	/xtalk	/10	/pci	/3	/ef	
3	/hw	/node	/xtalk	/10	/pci	/4	/tty	/1
4	/hw	/node	/xtalk	/10	/pci	/4	/tty	/2
5	/hw	/node	/xtalk	/10	/pci	/5	/tty	/1
6	/hw	/node	/xtalk	/10	/pci	/5	/tty	/2
7	/hw	/node	/xtalk	/10	/pci	/6	/tty	/1
8	/hw	/node	/xtalk	/10	/pci	/6	/tty	/2

Logical Controller Number Column

The Logical Controller Number refers to the number assigned to a port on an optional board by the operating system. These numbers are always higher than that of a port on the system module. Ports of the same type are assigned incrementing port numbers. For example, because there is one Ethernet port on the system module, the logical number assigned to the first optional Ethernet port the software identifies 2. Because there are two serial ports on the system module, the first logical number assigned to an optional serial port is 3. Subsequent optional serial ports are labeled 4, 5, 6, and so on.

Hardware, Node, and XIO (xtalk) Bus Type Columns

Ignore the Hardware, Node, and XIO (xtalk) Bus Type columns when looking for information in the ioconfig.conf file. They appear in the file to report that hardware is being probed, on one node, using crosstalk as the communication tool within the workstation.

Physical ID Column
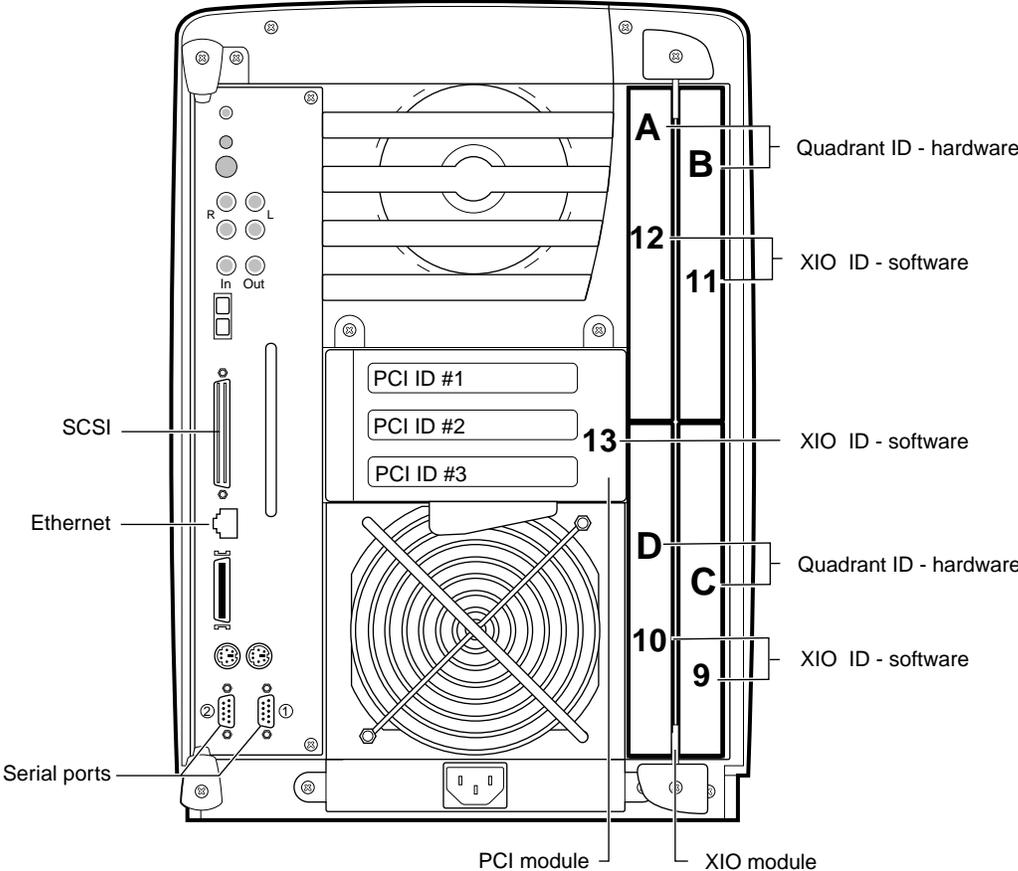
Figure 2-4   Physical Identification

Use Figure 2-4 to determine the physical XIO ID number. If the board is in the XIO module, determine the physical ID number by the following rule: XIO module, quadrant A = 12, quadrant B = 11, quadrant D = 10, and quadrant C = 9.

Note: Physical port numbers are assigned in descending XIO probing order. Example: an Ethernet board in the PCI module (13) is assigned logical port 2 before an Ethernet port in quadrant C (9) of the XIO module because 13 is probed before 9.

PCI Bus Type Column

This column is read only in conjunction with the Physical ID column that comes before it (see Table 2-3). If the Physical ID number is 13, the board is in the PCI module.

Bus ID and Port Type Columns

The Bus ID column refers to the number of the physical port on the option board.

In Table 2-3, the shaded line, logical controller number 4 (XIO module quadrant D, Physical ID 10), is an option board (with multiple Ethernet and serial ports) specifying port number 2, labeled on the option board as port 2. The abbreviation in the Port Type column identifies this port as an Ethernet (ef) port.

Table 2-3   Example of an ioconfig.conf File

Logical Controller Number	Hardware	Node	XIO (xtalk) Bus Type	Physical ID	PCI Bus Type	Bus ID	Port Type (Abbreviation)	Serial Port ID
2	/hw	/node	/xtalk	/10	/pci	/0	/ef	
3	/hw	/node	/xtalk	/10	/pci	/1	/ef	
4	/hw	/node	/xtalk	/10	/pci	/2	/ef	
5	/hw	/node	/xtalk	/10	/pci	/3	/ef	
3	/hw	/node	/xtalk	/10	/pci	/4	/tty	/1
4	/hw	/node	/xtalk	/10	/pci	/4	/tty	/2
5	/hw	/node	/xtalk	/10	/pci	/5	/tty	/1
6	/hw	/node	/xtalk	/10	/pci	/5	/tty	/2

Table 2-4 explains the abbreviations you might find in the Port Type Column of the ioconfig.conf file.

Table 2-4   Abbreviations and Definitions

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

Serial Port ID Column
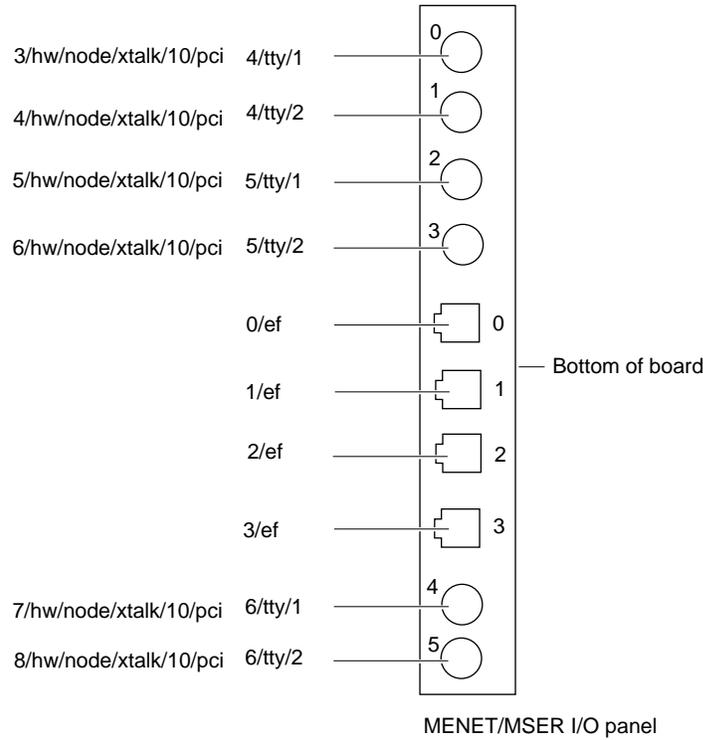
Figure 2-5 MENET/MSER I/O Panel Ports Mapped to ioconfig.conf File Information

Because each pair of serial ports share a bus, the Serial Port ID column identifies which serial port is on which bus. Use Figure 2-5 to identify the serial port number.

Mapping the Logical Port Numbers to the Physical Port Locations

1. Determine your logical controller ID number.

2. Use the logical controller number to determine the port number on the option board.

3. Use the abbreviation in the Port Type Abbreviation column of Table 2-3 to help you determine the type of port.

4. Find the logical controller number (x) for the port you have located (first column).

For instructions on installing cables, go to the next section.

Installing the Cables

Before installing the cables, read the previous sections beginning with "About the ioconfig.conf File" on page 30. Then go to "Ethernet Cables" on page 37 or "Serial Cables" on page 38.

Ethernet Cables

1. Open another UNIX shell and at the prompt type **hinv**

2. Use the information in the *hardware inventory* (*hinv*) file to find the port you are interested in. Look for the Integral (SCSI or Fast Ethernet) Controller number (x) that matches the Logical Controller number in the *ioconfig.conf* file (first column.)

3. Under the Integral (SCSI or Fast Ethernet) Controller information, find the port you are interested in. If you have connected a cable, the device should appear in the hardware inventory. If you have not connected a cable, a device should not be recognized as being attached to that port.

4. For each configured IP network interface, identify the port on the MENET board that services that subnetwork. If you have not already done so, see "About the ioconfig.conf File" on page 30.

5. For each configured interface, locate the site's Ethernet cable for that subnetwork.

    Note: External Ethernet cables are customer supplied. External cables and all cabling must conform to either the 10-Base-T or 100-Base-TX specification.

6. Optional: Put labels on the I/O panel and the cables.

    Note: Label carefully. An Ethernet connection does not function if its configured IP address does not match the subnetwork address used by other systems on that cable.

7. Insert the cable's RJ-45 connector into the IRIS Fast Ethernet port.

8. Proceed to "After Installing the Board and Cables" on page 38.

Serial Cables

1. Open another UNIX shell and at the prompt type `hinv`

2. Use the resulting information in the *hardware inventory (hinv)* file to find the port you are interested in. Look for the IOC3 serial port number (x) that matches the logical controller number in the *ioconfig.conf* file (first column.)

3. For each serial peripheral device that you wish to attach, identify which port has been configured to service that device.

4. Select an appropriate cable for attaching the peripheral device to the mini-DIN8 serial port on the MSER XIO board. See Table 2-1 for details.

5. Attach the cable.

6. Proceed to "After Installing the Board and Cables" on page 38.

After Installing the Board and Cables

When the board is installed and connected, and the OCTANE workstation is powered on, follow the instructions in this section to start operation.

Note: The Ethernet connections cannot function unless the software and hardware have been configured, as described in the *Personal System Administration Guide* or *IRIX Admin: Networking and Mail*.

1. Log on to the workstation.

2. If you have not installed and configured the IRIX TCP/IP and router software, do so now by following the instructions in the *IRIX Admin: Networking and Mail* online document. The Ethernet connections do not function until their network interfaces (*ef#*) have been configured.

3. After you finish configuring the software, reboot the system (or run the *autoconfig* command) to build a new operating system (kernel) that includes the new driver. Then, reboot the system again to start running this new operating system.

4. If you have not installed and configured the IRIX serial (*tty*) software, do so now by following the instructions in the *Personal System Administration Guide* or *IRIX Admin: Peripheral Devices* online document. The serial connections do not function until they have been configured.

5. Verify that the board's LEDs (only for Ethernet) indicate normal operation.

6. Verify that the board has been located by the operating system during the boot phase, with either of the following commands:

For the Ethernet ports use:

```
%hinv -c ethernet
Integral Fast Ethernet: ef0, version #
Integral Fast Ethernet: ef1, version #
Integral Fast Ethernet: ef2, version #
Integral Fast Ethernet: ef3, version #
Integral Fast Ethernet: ef4, version #
```

In the above example, the *ef0* entry belongs to the OCTANE system module.

For the serial ports use:

```
%hinv -c serial
IOC3 serial port: tty1
IOC3 serial port: tty2
IOC3 serial port: tty3
IOC3 serial port: tty4
IOC3 serial port: tty5
IOC3 serial port: tty6
IOC3 serial port: tty7
IOC3 serial port: tty8
```

In this example, the *tty1* and *tty2* entries belong to the serial ports on the OCTANE system module.The subsequent six entries (*tty3* through *tty8*) are the ports on the MENET/MSER option board. There are other lines in this display, but you can ignore all but the ones listed here.

If you have two or three MENET/MSER boards installed in the OCTANE workstation, remember that the polling begins with the system module, then polls the XIO slots in the order discussed in the section "Physical ID Column" on page 33.

Removing the IRIS 4-Port Ethernet Adapter With Asynchronous Serial XIO Option Board

This chapter provides detailed information on removing the IRIS 4-Port Ethernet Adapter with Asynchronous Serial (MENET/MSER) option board. Option boards are removed for re-placement in a system because of other option boards slot or connectivity requirements, for placement in another OCTANE workstation, or for board replacement.

The following topics are included in this chapter:

- "Detaching the MENET/MSER Option Board From the XIO Module" on page 43.
- "Placing an Option Board or Blank Panel in Slot B" on page 44.
- "Returning Parts" on page 47.

To remove the IRIS 4-Port Ethernet Adapter with Asynchronous Serial (MENET/MSER) option board, you need a Phillips head screwdriver, a wrist strap, a compression connector cap, and a blank panel or new MENET/MSER option board.

Preparing to Remove the MENET/MSER Option Board

Removing an MENET/MSER option board requires following a series of steps that lead up to the board removal, through the steps that complete the task. Follow the directions in this chapter to remove this board and to install another board or blank panel in its place.
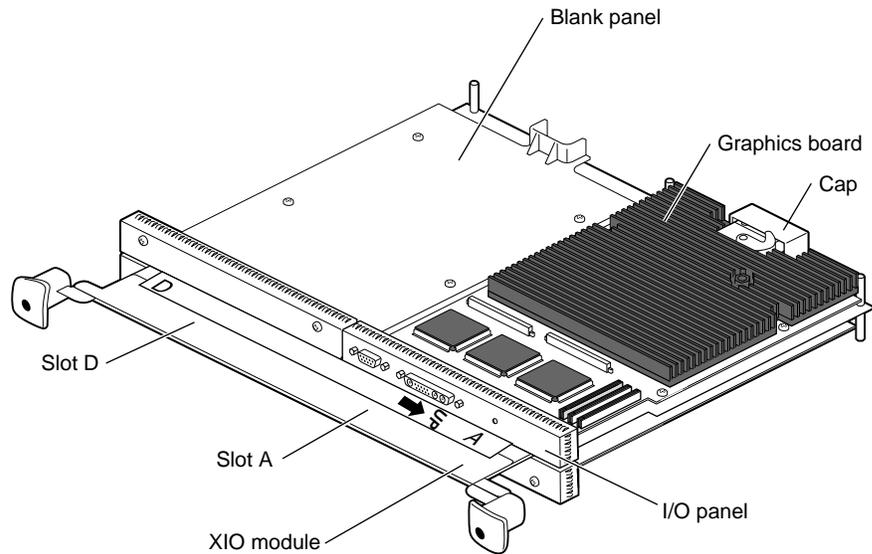

Figure 3-1   Orienting the XIO Module and Graphics Board

1. Go to Chapter 1, "Preparing the Workstation" on page 4, and follow the directions through removing the XIO module. Be sure you have placed a cap on the XIO compression connections of the graphics board, MENET/MSER, and any other XIO boards. Then return to this section, and begin with step 2.

2. Position the XIO module so that slots B and C are facing you. The graphics board is in slot A or D and A. Locate the MENET/MSER board. (An illustration of this board is in Appendix A.)

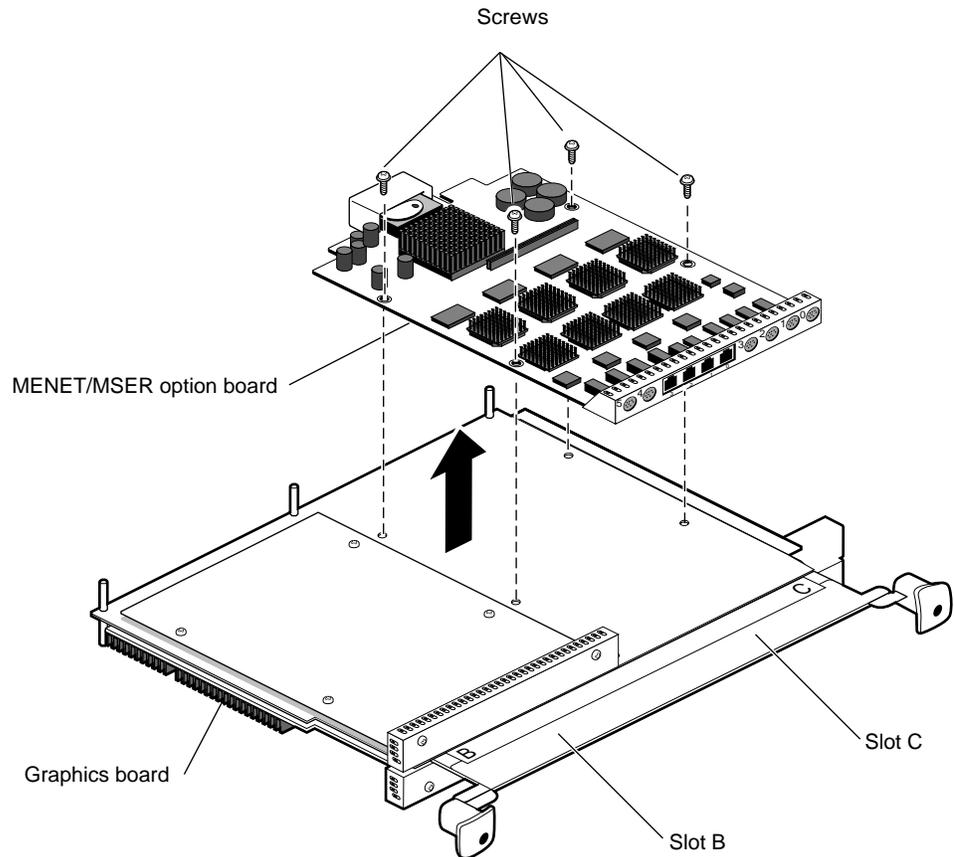## Detaching the MENET/MSER Option Board From the XIO Module

Figure 3-2   Removing the MENET/MSER Option Board

Note: For illustration purposes, the MENET/MSER option board is shown in slot C in this manual.

1.   Remove the four screws holding the MENET/MSER board to the XIO module.

2.   Lift the MENET/MSER board from the XIO module. Place it on an antistatic bag on a clean, dry surface such as your desktop.

43

Placing an Option Board or Blank Panel in Slot B

After you have removed the MENET/MSER option board, choose your next step from the following task list.

Task...	Go to...
Installing a new MENET/MSER board.	Chapter 1, page 17.
Installing another option board.	The installation guide for that option board.
Installing a blank panel.	The next step.

A blank panel must be installed in slot B of the XIO module if no option board is installed in that slot. If a blank panel is also in slot C, a baffle must be placed over them to allow proper airflow in the workstation.
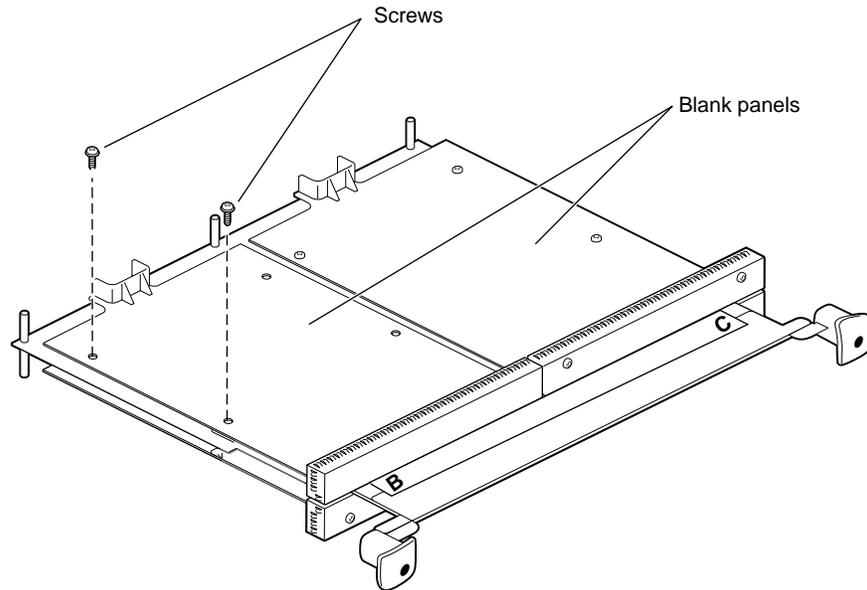
Figure 3-3   Placing a Blank Panel on the XIO Module

1.   Place the blank panel on the standoffs on the XIO module.

2.   Use two short screws to attach the blank panel (on the outside edge) to the XIO module if you are installing a baffle, as shown in Figure 3-3.

3.   If you are not installing a baffle, use four screws to install the blank panel to the XIO module.

     Caution: Do not use the long screw that comes with the spacer to attach a blank panel to the XIO module. It will damage the XIO module standoffs.
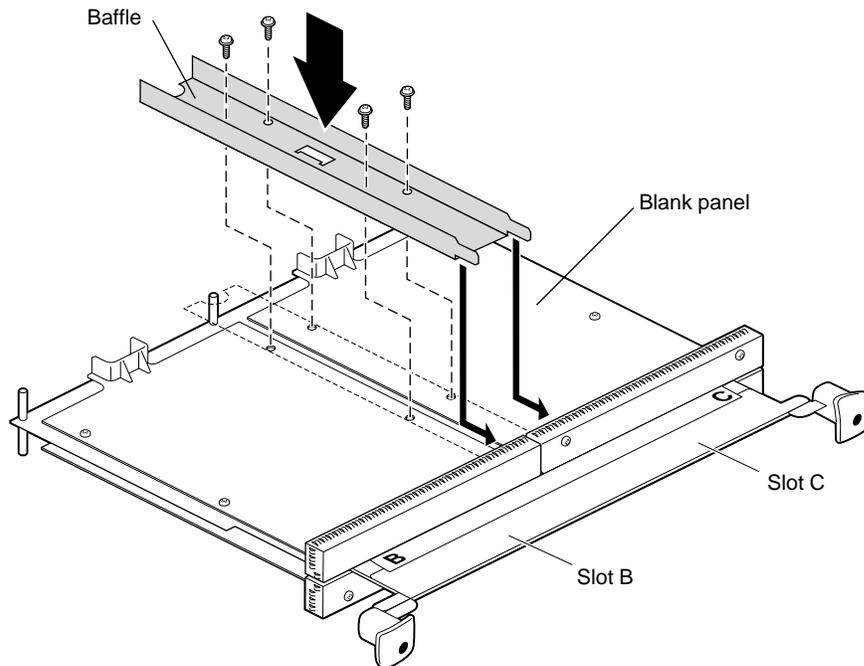
45

Figure 3-4   Placing the Baffle Over Two Blank Panels

4. If you have two blank panels side by side, place a baffle over both.

    ■   First remove the two inside screws from the blank panel in slot C.

    ■   Place the baffle across the two blank panels.

    ■   Insert and tighten the four screws that hold the baffle to the blank panels and XIO module.

    Caution: You must replace the baffle for cooling purposes when you install two side-by-side blank panels. The baffle is used only with two side-by-side blank panels.

5. If you are sending the MENET/MSER option board to your authorized service representative, use the packing material and box in which you received your replacement part.

6. Remove any compression connector caps from boards attached to the XIO module.

7. Go to "Replacing the XIO Module" on page 18.

Returning Parts

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

Troubleshooting

The following troubleshooting list provides tips on finding and solving installation problems.

- The xbow chip on the frontplane must be rev1.3 or later. See Chapter 1, "Checking the Version of the Xbow Chip" on page 3, for instructions for checking that you have the 1.3 (or later) xbow chip that is required for use with the MENET/MSER option board. Also included is information for ordering the no-cost upgrade if it is needed.

- The power cables are connected to the workstation and the monitor.

- The cable connectors at the chassis I/O panel are inserted correctly, wide key matched to wide key, and narrow key matched to narrow key. (It is possible to force these connectors together improperly.)

- The cables to the I/O panels on each graphics or option board are completely seated.

- The MENET/MSER option board and graphics board are properly seated in the chassis. Follow instructions in Chapter 2 for opening the chassis.

- The appropriate operating system and software have been installed. See the software CD and release notes that came with your shipment. If you installed the software after installing the hardware, be sure to reboot your system.

- The graphics boards are on the left side of the XIO module when being inserted in the workstation.

- The XIO module is seated and the I/O panel on the MENET/MSER option board is relatively flush with the chassis. If it is not, follow the instructions in Chapters 2 and 4 from powering off the workstation through removing the XIO module, and see if an XIO compression connector cap is on any XIO compression connector. If so, remove the cap. Follow the instructions for reinstalling the XIO module and powering on the workstation.

Identifying the Option and Graphics Boards

This appendix provides illustrations of the IRIS 4-Port Ethernet Adapter with Asynchronous Serial XIO Option board for the OCTANE workstation, OCTANE/SI graphics board, OCTANE/SI graphics board with texture memory option board, OCTANE/SSI graphics board, and OCTANE/MXI graphics board.

- "OCTANE MENET/MSER Option Board" on page 51.
- "OCTANE/SI Graphics Board" on page 52.
- "OCTANE/SI With Texture Memory Option Board" on page 53.
- "OCTANE/SSI Graphics Board" on page 54.
- "OCTANE/MXI Graphics Board" on page 55.

OCTANE MENET/MSER Option Board
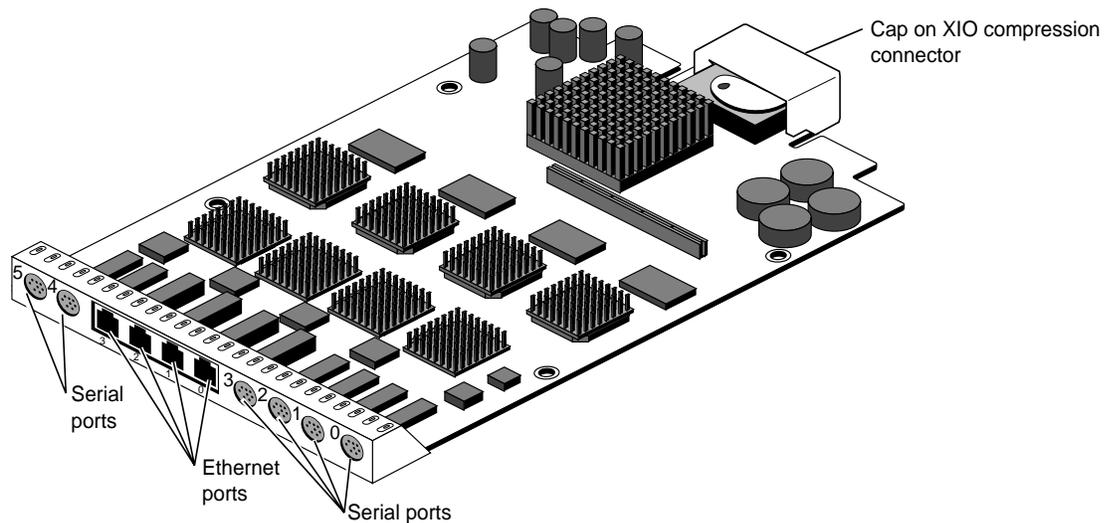
Figure A-1   OCTANE MENET/MSER Option Board

OCTANE/SI Graphics Board

Connectors for texture
memory board

Cap on XIO compression
connector

Flex cable connectors
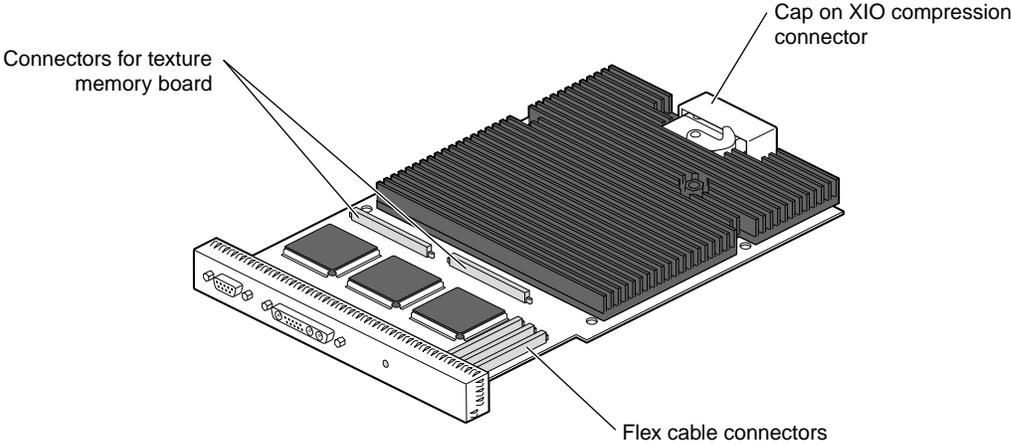
Figure A-2   OCTANE/SI Graphics Board

OCTANE/SI With Texture Memory Option Board

Connectors beneath texture memory board

Cap on XIO compression connector

Texture memory board

Flex cable connectors
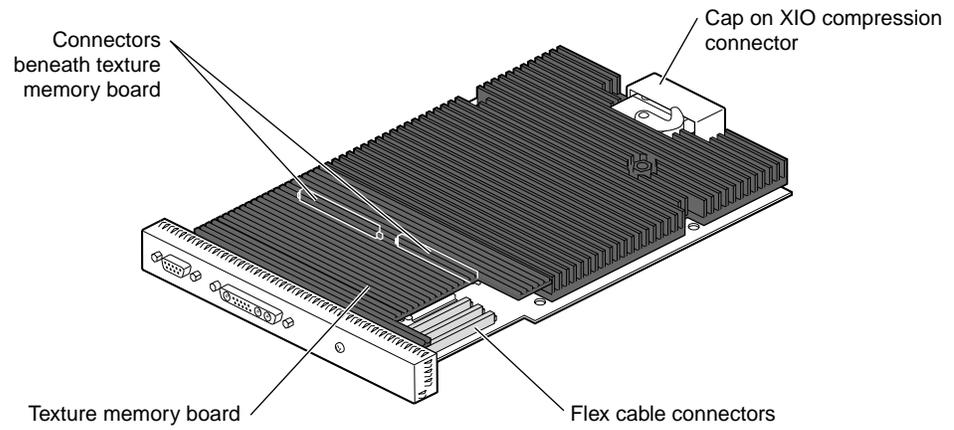
Figure A-3   OCTANE/SI With Texture Memory Option Board

OCTANE/SSI Graphics Board
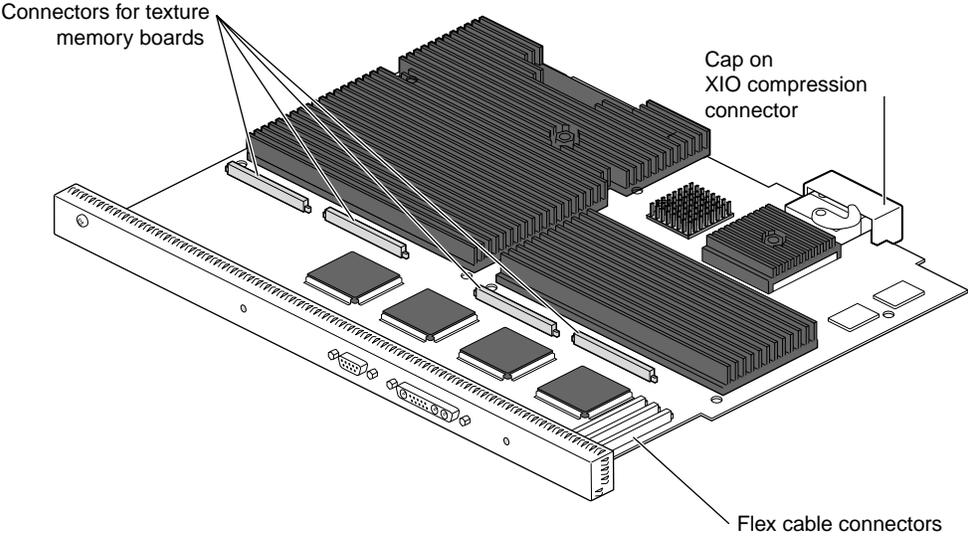
Figure A-4   OCTANE/SSI Graphics Board

OCTANE/MXI Graphics Board

Connectors for texture
memory boards

Cap on
XIO compression
connector

Texture memory boards

Flex cable connectors
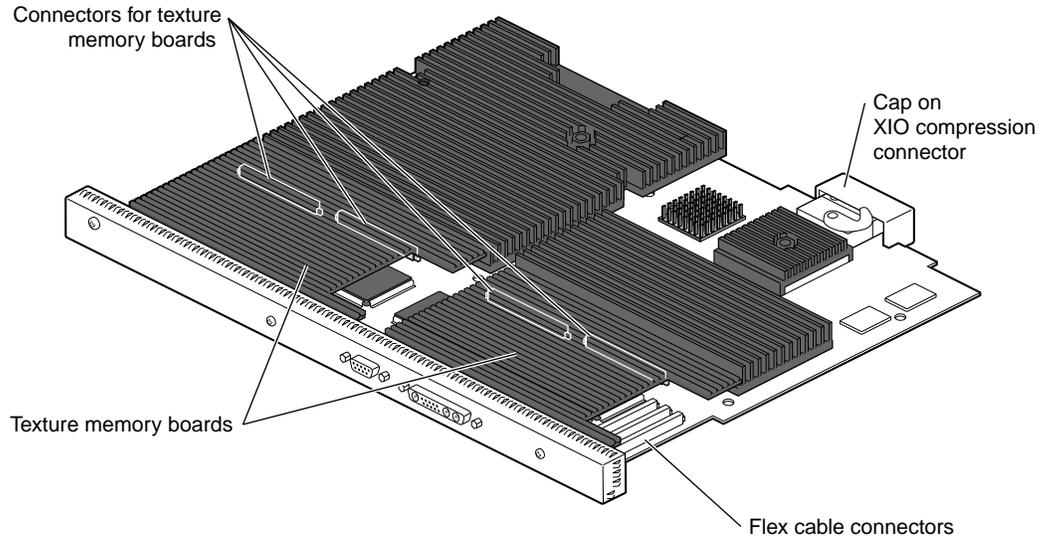
Figure A-5   OCTANE/MXI Graphics Board

Care and Cleaning of the XIO Compression Connector

This appendix provides information about the care and cleaning of the compression connectors. The OCTANE workstation uses compression connectors to connect several modules and most XIO boards to the workstation.

A single compression connector is used in the OCTANE workstation in these locations:

- on the back of the PCI module

- on most XIO boards 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.
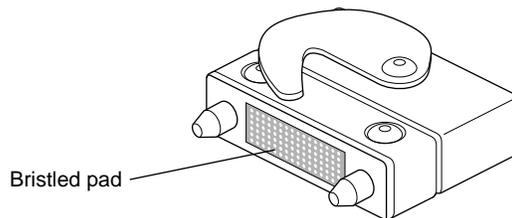

Bristled pad

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 import to prevent this from occurring.

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.

- Do not wipe or touch the pads of the compression connector with anything (no fingers, brushes, cloth, 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 outside its protective bag.

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.

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 in this section 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 in the USA) 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.

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.
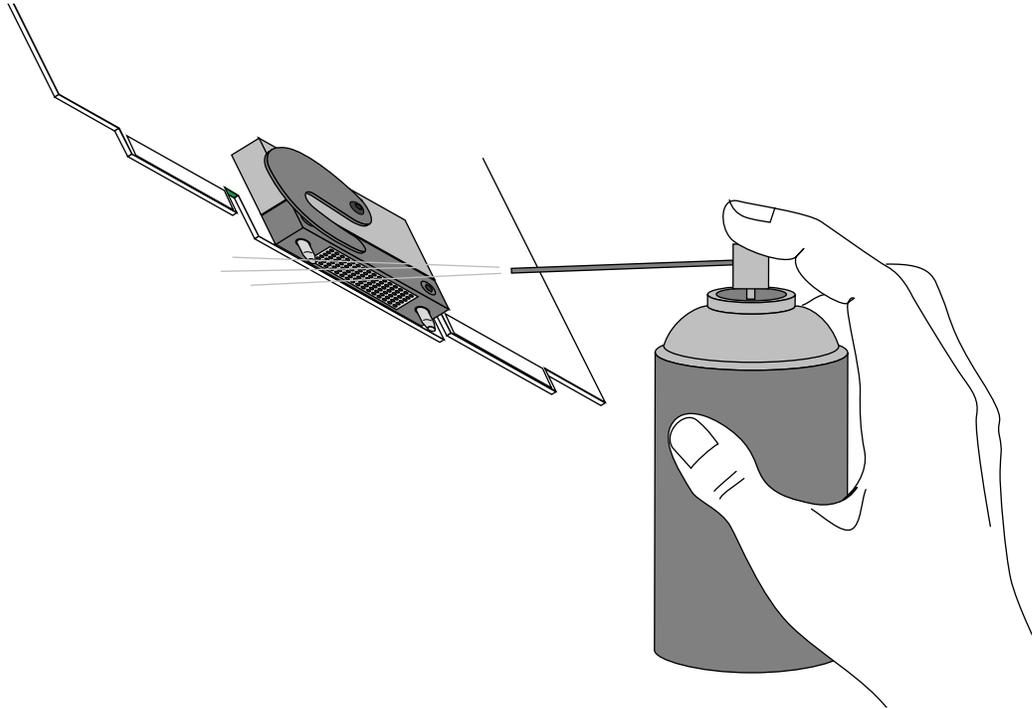
Figure B-2   Cleaning the Compression Connector

> **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.

U

Ultra SCSI option board, removing, 41

W

wrist strap, 7

X

xbow chip, determining the version, 3
XIO boards, information, 14
XIO module, 6
  information, 14
  slots, 14

Index

Tell Us About This Manual

As a user of Silicon Graphics products, you can help us to better understand your needs and to improve the quality of our documentation.

Any information that you provide will be useful. Here is a list of suggested topics:

- General impression of the document
- Omission of material that you expected to find
- Technical errors
- Relevance of the material to the job you had to do
- Quality of the printing and binding

Please send the title and part number of the document with your comments. The part number for this document is 007-3582-001.

Thank you!

Three Ways to Reach Us

- To send your comments by **electronic mail**, use either of these addresses:
  - On the Internet: techpubs@sgi.com
  - For UUCP mail (through any backbone site): *[your_site]*!sgi!techpubs
- To **fax** your comments (or annotated copies of manual pages), use this fax number: 650-932-0801
- To send your comments by **traditional mail**, use this address:

  Technical Publications
  Silicon Graphics, Inc.
  2011 North Shoreline Boulevard, M/S 535
  Mountain View, California 94043-1389