

**IRIS[®] 4-Port Fast Ethernet Adapter with
Asynchronous Serial XIO[™] Board
Installation Instructions**

Document Number 108-0151-001

Contributors

Written by Carlin Otto

Illustrated by Dan Young, Cheri Brown, and Carlin Otto

Production by Linda Rae Sande

Engineering contributions by Ken Powell

© Copyright 1996, Silicon Graphics, Inc.— All Rights Reserved

The contents of this document may not be copied or duplicated in any form, in whole or in part, without the prior written permission of Silicon Graphics, Inc.

Restricted Rights Legend

Use, duplication, or disclosure of the technical data contained in this document by the Government is subject to restrictions as set forth in subdivision (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 52.227-7013 and/or in similar or successor clauses in the FAR, or in the DOD or NASA FAR Supplement. Unpublished rights reserved under the Copyright Laws of the United States. Contractor/manufacturer is Silicon Graphics, Inc., 2011 N. Shoreline Blvd., Mountain View, CA 94043-1389.

FCC Warning

This equipment has been tested and found compliant with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions in this manual, may cause harmful interference to radio communications. Changes or modification to this product not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

You may find the following booklet, prepared by the Federal Communications Commission of the United States of America, helpful: *Interference Handbook 1993 Edition*. This booklet is available from the U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington D.C. 20402-9328, ISBN 0-16-041736-8.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Attention

Le présent appareil numérique n'émet pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe A prescrites dans le Règlement sur les interférences radioélectriques établi par le Ministère des Communications du Canada.

Manufacturer's Regulatory Declarations

This device conforms to several national and international specifications and European directives as listed on the "Manufacturer's Declaration of Conformity," which is included with each computer system and peripheral. The CE insignia displayed (illustrated below) on each device is an indication of conformity to the European requirements.

This device has several governmental and third-party approvals, licenses, and permits. Do not

modify this product in any way that is not expressly approved by Silicon Graphics, Inc. If you do, the customer may lose these approvals and their governmental agency's permission to operate this device.



VCCI Class 1 Statement for Japan

この装置は、第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

この装置は、第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

**IRIS® 4-Port Fast Ethernet Adapter with Asynchronous Serial XIO™ Board
Installation Instructions
Document Number 108-0151-001**

**Silicon Graphics, Inc.
Mountain View, California**

Silicon Graphics, the Silicon Graphics logo, Challenge, Indigo, Indy, IRIS and Onyx are registered trademarks, and Indigo², IRIX, O2, Onyx2, Origin, Origin200, Origin2000, S2MP, and XIO are trademarks of Silicon Graphics, Inc. CrayLink is a trademark of Cray Research. Macintosh is a registered trademark and AppleTalk is a trademark of Apple Computer, Inc.

Contents

	About This Document	xi
1.	Overview and Care of the Board	1-1
1.1	Introduction to XIO Boards	1-1
1.1.1	General Overview of XIO Boards	1-1
1.1.2	Hook Actuator	1-2
1.1.3	Caring for the Compression Connector	1-3
1.1.3.1	Guidelines for Storing and Handling the Compression Connector on an XIO Board	1-4
1.1.3.2	Guidelines for Cleaning the Compression Connector on an XIO Board	1-4
1.2	Overview of IRIS 4Port Fast Ethernet with Asynchronous Serial XIO Board	1-6
1.2.1	Block Diagram of MENET/MSER XIO Board	1-6
1.2.2	Electrostatic Discharge	1-7
1.2.3	Serial Port Compatibility Issues for MENET/MSER XIO Board	1-8
1.2.4	Site Cabling	1-8
1.2.4.1	Ethernet Cable Requirements	1-8
1.2.4.2	Asynchronous Serial Cable Requirements and Port Pinout	1-9
1.2.5	Panel Plate and LEDs	1-10
1.2.6	Maximum Number of MENET/MSER Boards	1-11
1.2.7	Power Requirements	1-12
1.2.8	Software	1-12
2.	Installation Instructions for Origin2000 Deskside	2-1
2.1	Verify All Parts Are Available	2-1
2.2	Know How to Avoid Damaging the Board	2-1
2.3	Install and Configure Software	2-2
2.4	Make System Safe	2-2
2.5	Select and Prepare Slot	2-4
2.6	Install MENET/MSER XIO Board	2-7

2.7	Attach Cables.....	2-9
2.7.1	Ethernet Cables.....	2-9
2.7.2	Serial Cables.....	2-9
2.8	Finish.....	2-9
3.	Installation Instructions for Onyx2 Deskside	3-1
3.1	Verify All Parts Are Available	3-1
3.2	Know How to Avoid Damaging the Board	3-1
3.3	Install and Configure Software	3-2
3.4	Make System Safe	3-2
3.5	Select and Prepare Slot.....	3-4
3.6	Install MENET/MSER XIO Board.....	3-7
3.7	Attach Ethernet and Serial Cables	3-9
3.7.1	Ethernet Cables.....	3-9
3.7.2	Serial Cables.....	3-9
3.8	Finish.....	3-9
4.	Installation Instructions for Origin2000 and Onyx2 Rackmount.....	4-1
4.1	Verify All Parts Are Available	4-1
4.2	Know How to Avoid Damaging the Board	4-1
4.3	Install and Configure Software	4-2
4.4	Select a Slot for the Board	4-3
4.5	Make System Safe and Prepare for the Installation	4-5
4.6	Install MENET/MSER XIO Board.....	4-9
4.7	Attach Ethernet and Serial Cables	4-11
4.7.1	Ethernet Cables.....	4-12
4.7.2	Serial Cables.....	4-13
4.8	Finish.....	4-13

List of Figures

Figure 1-1	Generic XIO Board.....	1-2
Figure 1-2	The Compression Connector Used on XIO Boards.....	1-3
Figure 1-3	Position for Dry Compressed Air Can When Cleaning Compression Connector.....	1-5
Figure 1-4	Components on MENET/MSER XIO Board.....	1-6
Figure 1-5	Block Diagram of MENET/MSER XIO Board.....	1-7
Figure 1-6	Pin Numbering for Mini-DIN8 Serial Port Panel Plate Connectors on MENET/MSER XIO Board.....	1-9
Figure 1-7	Mini-DIN8 to Male DB9 Adapter Cable: MAC-style or PC/AT-style Pinout.....	1-10
Figure 1-8	Panel Plate and LEDs for MENET/MSER XIO Board.....	1-11
Figure 2-1	Rear of Origin2000 Deskside.....	2-5
Figure 2-2	I/O Items in the Origin2000 Deskside Chassis.....	2-6
Figure 2-3	Removing the Protective Cap from the Compression Connector.....	2-7
Figure 2-4	Proper Orientation for XIO Boards in Origin2000 Deskside Slots.....	2-8
Figure 3-1	Rear of Onyx2 Deskside.....	3-5
Figure 3-2	XIO Items in Onyx2 Deskside.....	3-6
Figure 3-3	Removing the Protective Cap from the Compression Connector.....	3-7
Figure 3-4	Proper Orientation for XIO Board in Onyx2 Deskside Slots.....	3-8
Figure 4-1	I/O Items in a Processor Module (Chassis) of an Origin2000 or Onyx2 Rackmount.....	4-4
Figure 4-2	Rear of an Origin2000 Rackmount.....	4-6
Figure 4-3	Rear of an Onyx2 Rackmount.....	4-7
Figure 4-4	Removing the Protective Cap from the Compression Connector.....	4-9
Figure 4-5	Proper Orientation for XIO Board in Slots.....	4-10
Figure 4-6	XIO Cable Management Box.....	4-11
Figure 4-7	Door Operation for XIO Cable Management Box.....	4-12

List of Tables

Table 1-1	How to Convert MSER Port to a Pinout Equivalent of Another SGI Serial Port.....	1-8
Table 1-2	Signal Assignment for Serial Ports on MENET/MSER XIO Board.....	1-9
Table 1-3	Maximum Number of MENET/MSER XIO Boards That Can Be Installed.....	1-11
Table 1-4	Power Requirements for MENET/MSER XIO Board.....	1-12
Table 2-1	Component List for MENET/MSER XIO Board	2-1
Table 3-1	Component List for MENET/MSER XIO Board	3-1
Table 4-1	Component List for MENET/MSER XIO Board	4-1
Table 4-2	Rackmount Slot Selection Rules for the MENET/MSER XIO Board.....	4-3

About This Document

This guide provides instructions for installing the IRIS[®] 4-Port Fast Ethernet Adapter with Asynchronous Serial XIO[™] Board. Each chapter describes the installation steps for a different Silicon Graphics[®] chassis: Origin2000[™] Deskside, Onyx2[™] Deskside, and Origin2000 and Onyx2 Rackmounts.

Note: These instructions are written for system service engineers (SSEs) who have been trained by Silicon Graphics (SGI). The information in this document should not be copied. The information should not be shown to people who do not work for SGI.

The IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial XIO board provides 4 Ethernet and 6 asynchronous serial connections for an SGI host. Each Ethernet port autonegotiates to operate at either 10 megabits per second (10Base-T) or 100 Mbs (100Base-TX). Each asynchronous serial port can operate with RS-232-style signals or MAC-style signals; each serial port can operate at up to 460 kBaud. All the serial ports on SGI equipment (including the ones with this product) function as data terminal equipment (DTE). The software (that is, Ethernet and asynchronous serial drivers) for this board ships with the IRIX[™] operating system. Administration for these ports and interfaces is described in the online documents, *IRIX Admin: Networking and Mail* and *IRIX Admin: Peripheral Devices*.

In order to function, an IRIS Fast Ethernet port must be connected to an Ethernet port on either a hub, switch, or a host. An asynchronous serial port must be connected to an asynchronous peripheral device or to itself via a loopback cable (for testing purposes). Site cabling requirements are described in “Site Cabling” in Chapter 1 of this document.

Chapter 1

Overview and Care of the Board

1.1 Introduction to XIO Boards

1.1.1 General Overview of XIO Boards

XIO boards are optional products for Silicon Graphics platforms based on the scalable shared-memory multi-processing (S2MP™) architecture. XIO boards install into the XIO slots of Origin2000 and Onyx2 systems. Each active XIO slot provides up to 800 megabytes per second of bi-directional bandwidth (that is, 400 megabytes in each direction) through a crossbar switch that is located on the system's midplane. Specific XIO products may use a small portion or all of this available bandwidth. All the XIO slots in a system can be active simultaneously. For more details on how XIO slots fit into the rest of the system, see *Origin2000 Deskside and Rackmount Installation Instructions* and *Onyx2 Deskside and Rackmount Installation Instructions*.

Every XIO board has the following items (illustrated in Figure 1-1):

Compression connector

This connector provides communication between the board and the system via the midplane or frontplane.

2 hooks on connector

Hooks hold the compression connector securely to midplane or frontplane. There is one hook on each side of the compression connector.

Hook actuator Device for moving compression connector hooks into and out of their locked position on the midplane.

Screw holes Holes for attaching a hook actuator to the board.

Panel plate Provides cutouts for external cables and light-emitting diodes (LEDs).

Tall-component side

The surface of the board that has the compression connector and the tallest components.

Short-component side

The side of the board with only low-profile components.

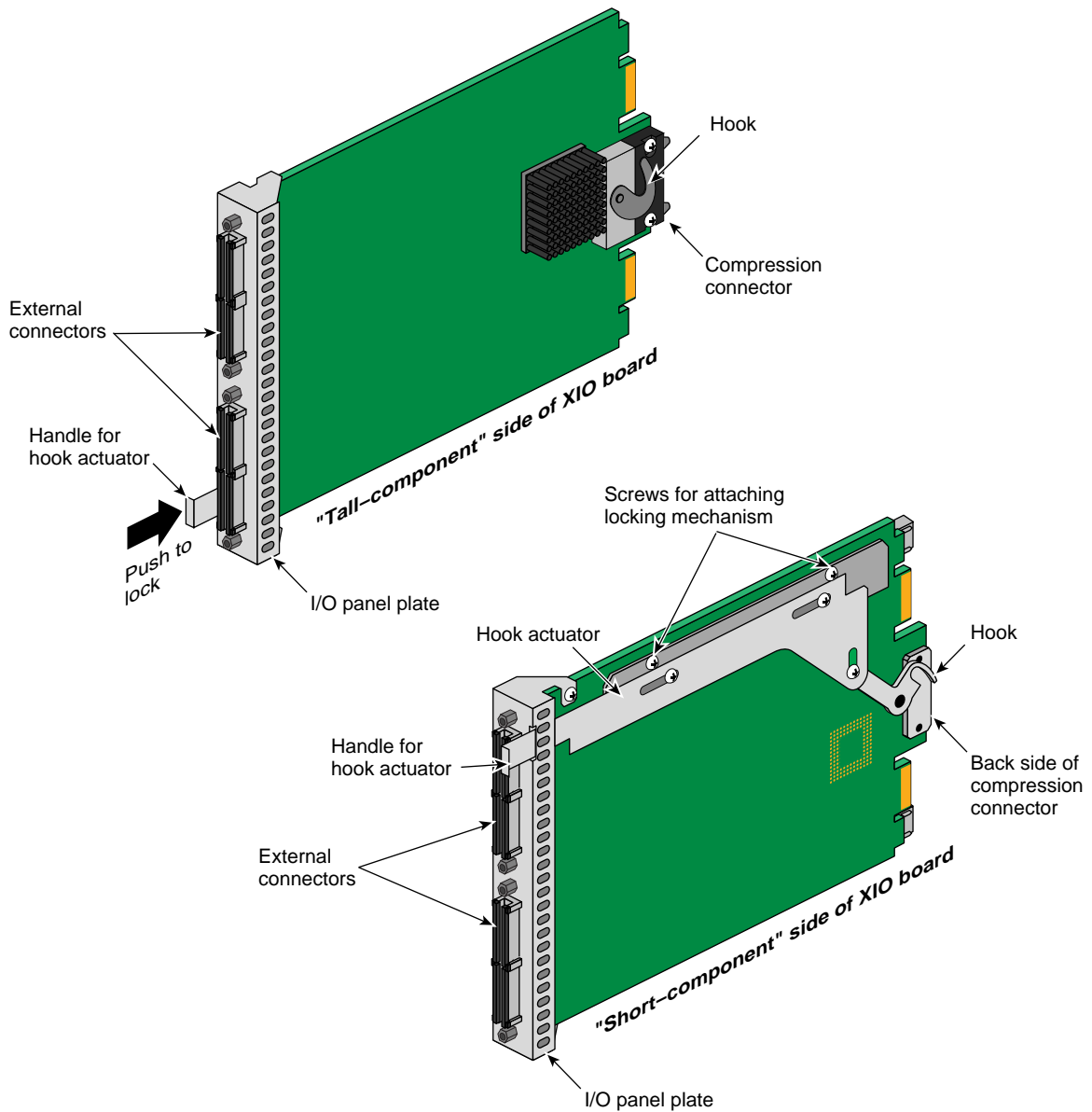


Figure 1-1 Generic XIO Board

1.1.2 Hook Actuator

For an XIO board to function, its compression connector must be locked tightly to a mate (other half) on the midplane, inside the chassis. The hook actuator is designed to do this.

Each XIO board has 2 hooks (one on each side of the compression connector). A hook actuator presses against one of the hooks, thus moving the hooks into and out of their locked position. The design of the hook actuator is different for different platforms.

For the Origin2000 and Onyx2 platforms, the hook actuator consists of a horizontally sliding lever and a handle; each type of XIO board may have a unique design for its lever and handle. Figure 1-1 shows one design. These hook actuators are screwed onto the XIO board and attached to one of the hooks, as illustrated in Figure 1-1.

The method of operation is the same for all level and handle designs, as described below:

- Pushing the handle locks the hooks and seats the compression connector to the midplane.
- Pulling the handle releases the hooks, in preparation for removing the board.

1.1.3 Caring for the Compression Connector

The compression connector used for XIO boards has 96 pads that enable passage of signals between the system (via the midplane) and the XIO board. This compression connector has 2 halves: one half is physically located on the XIO board (illustrated in Figure 1-2); the other half is on the midplane of the chassis. Each pad on a midplane connector is a flat, gold-plated surface. Each pad on an XIO board connector 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.

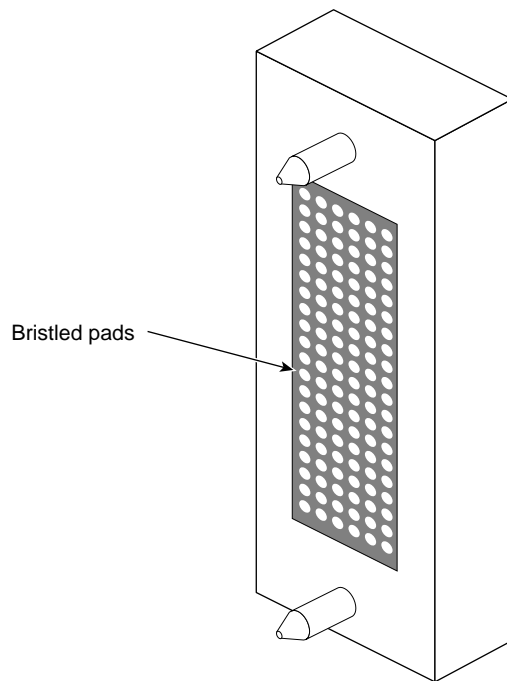


Figure 1-2 The Compression Connector Used on XIO Boards

The bristled pads are capable of attracting and holding 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 midplane. It is important to prevent this from occurring. Section 1.1.3.1 explains how to keep the compression

connector bristles clean; Section 1.1.3.2 explains how to clean them, in the event they become dirty.

1.1.3.1 Guidelines for Storing and Handling the Compression Connector on an XIO Board

To avoid damaging an XIO board's 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 board is not in an XIO slot, put the protective cap over the compression connector and store the board in an antistatic bag. Make sure to close (fold over) the open end of the bag in order 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 down onto a surface, make sure that the surface is free of dust, lint, powder, metal filings, oil, water, etc.
- Do not blow dust, dirt, or powder anywhere near the board when it is not inside its protective bag.

1.1.3.2 Guidelines for Cleaning the Compression Connector on an XIO Board

A compression connector should never need to be cleaned, if you keep the protective cover on whenever the XIO board is not installed. 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 will not repair damage incurred by this contact.

To remove pollutants, follow these instructions:

1. Obtain a can of dry, compressed inert gas (for example, 100% pure nitrogen).



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

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

3. Hold the can at an angle to the XIO board with the tip of the applicator 1 to 2 inches away from the first row of pads at the topmost edge of the connector (as illustrated in Figure 1-3). When you spray, the air will hit each pad and flow downward. Do not allow the applicator to touch the pads.

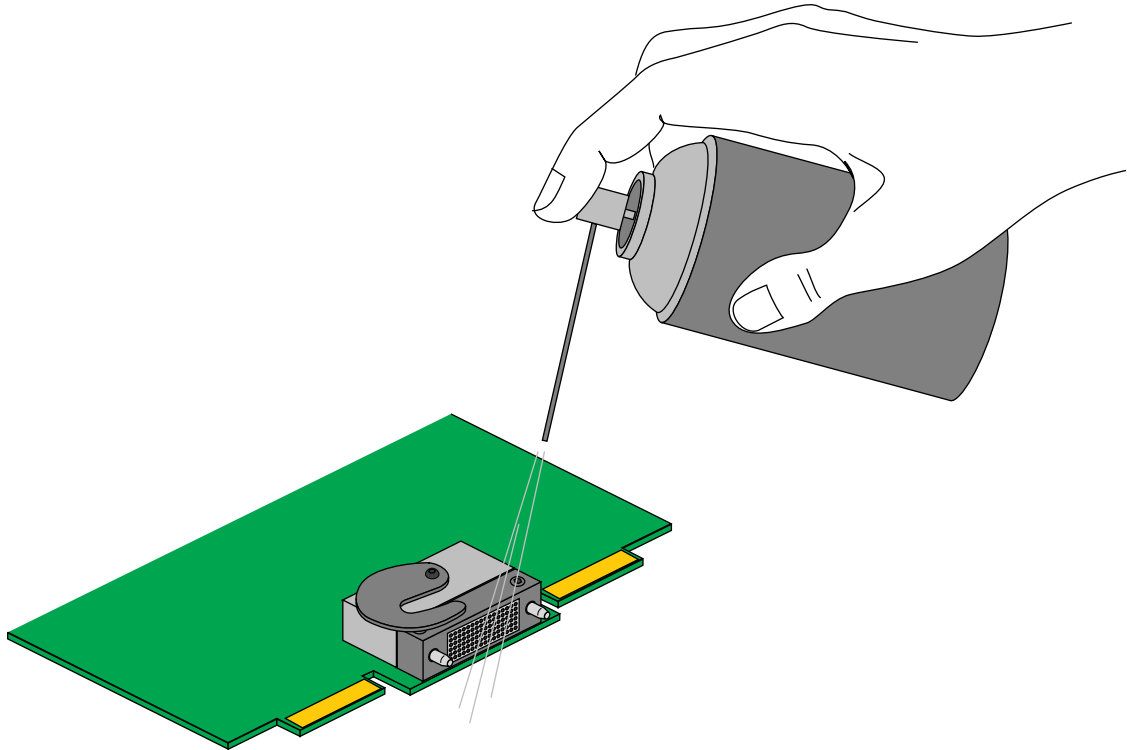


Figure 1-3 Position for Dry Compressed Air Can When Cleaning Compression Connector

4. 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.
5. Repeat until all the pads have been sprayed.
6. Replace the compression connector cap.

1.2 Overview of IRIS 4Port Fast Ethernet Adapter with Asynchronous Serial XIO Board

This section describes the IRIS 4Port Fast Ethernet Adapter with Asynchronous Serial (MENET/MSER) XIO board.

1.2.1 Block Diagram of MENET/MSER XIO Board

The MENET/MSER XIO board is a DMA-based board that uses a PCI bus as its local bus. The main components on this board are the following: SGI IOC3 chips* for Ethernet and serial protocol processing and the SGI Bridge chip for translation between the board's local bus and the system's IXO interconnect to the host (via the midplane). There are 128 kbytes of SRAM for buffering on each Ethernet data path. Figure 1-4 points out the major components on the board. Figure 1-5 is a general block diagram showing the main data paths.

Note: Do not remove or replace any of the socketed components. Moving any component (for example, a number-in-a-can [NIC] chip) from one socket or board to another may cause one or more boards to become dysfunctional.

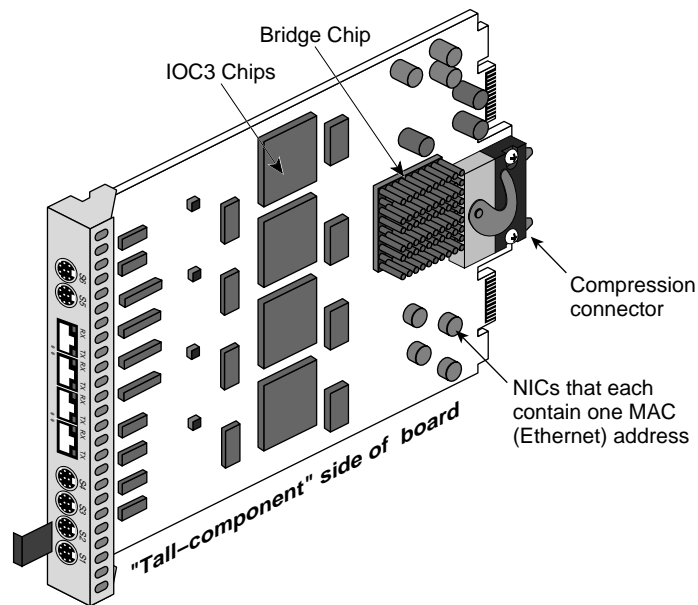


Figure 1-4 Components on MENET/MSER XIO Board

* This chip is also used on the XIO BaseIO board.

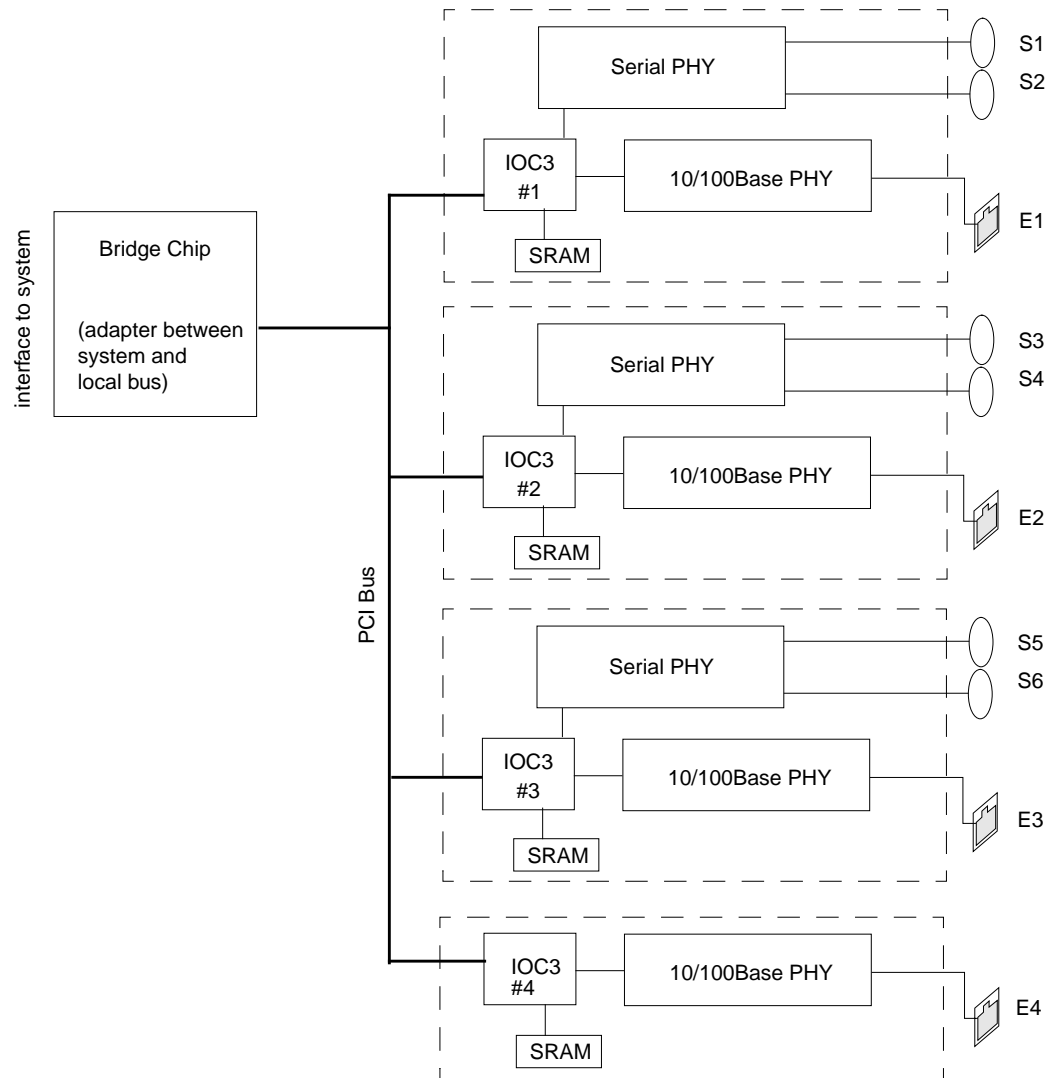


Figure 1-5 Block Diagram of MENET/MSER XIO Board

1.2.2 Electrostatic Discharge

The MENET/MSER XIO board is sensitive to damage from electrostatic discharge (ESD) caused by the buildup of electrical potential on clothing and other materials.

Caution: Exposure to ESD may irreparably damage this XIO board.

Follow these standard ESD preventive measures:

- Attach a ground strap to your wrist and to a grounded connection when installing, removing, or handling this board.

- Ensure that you and all electrical equipment that you handle during this installation are at ground potential to avoid damage from ESD.
- Until it is needed, keep the board in its antistatic bag.
- Remove the board from its antistatic bag only when you are properly grounded to the chassis ground with a ground strap.
- Place the board only on an antistatic mat or on its antistatic bag.
- When installing/removing this board, do not disconnect the power cord from the chassis. You will lose the system ground and could damage the equipment.

1.2.3 Serial Port Compatibility Issues for MENET/MSER XIO Board

The MSER board's female mini-DIN8 connectors are exactly like the ones used on SGI's Origin200™, Indy®, Indigo®, and Indigo2™ chassis. (See Table 1-2 for description of signals.) Table 1-1 describes the strategy that can be used for adapting MSER ports to present a point of connection that is like other serial ports on SGI systems.

Table 1-1 How to Convert MSER Port to a Pinout Equivalent of Another SGI Serial Port

SGI Chassis	How to Convert MSER Port to Another SGI Serial Port
Challenge®/Onyx® female DB9 ports	Construct a special cable.
Indy, Indigo, Indigo ² mini-DIN8 ports	MSER is an exact match.
Onyx2, Origin200, Origin2000 mini-DIN8 ports	MSER is an exact match.
O2™, Onyx2, Origin200, Origin2000 male DB9 connectors	Purchase an adapter cable from SGI. See "Asynchronous Serial Cable Requirements and Port Pinout" on page 9.

1.2.4 Site Cabling

This section covers the description of external cables for the IRIS MENET/MSER XIO board.

1.2.4.1 Ethernet Cable Requirements

The MENET/MSER XIO board provides 4 RJ-45 receptacles at 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 10Base-T (10 Mbps) or 100Base-TX (100 Mbps) network; each port independently autonegotiates 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 and follow the guidelines described in the physical layer standard for the speed used on the local area network. For example, the physical layer specification for 10Base-T specifies

category 3 unshielded twisted pair cable or better, while the standard for 100Base-TX specifies either 2-pair category 5 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*.

1.2.4.2 Asynchronous Serial Cable Requirements and Port Pinout

The MENET/MSER XIO board provides 6 mini-DIN8 female serial connectors. To activate 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 1-6 illustrates the pinout for the mini-DIN8 receptacles; Table 1-2 describes the function/signal assigned to each pin.

Table 1-2 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.

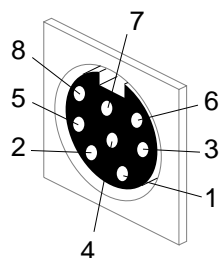


Figure 1-6 Pin Numbering for Mini-DIN8 Serial Port Panel Plate Connectors on MENET/MSER XIO Board

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, using the part numbers listed below. Have the customer contact their local sales representative.

- 018-0650-001 **6-inch Mini-DIN8 to Male DB9 Adapter Cable Assembly**
 This cable converts an 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 SGI BaseIO XIO board, O2, and Origin200 chassis (illustrated in Figure 1-7). Intended for use in attaching to DCE devices where the point of attachment is a female DB9 connector.

- 018-0644-001 **10-foot Null-modem 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. Intended for use in attaching to DTE devices that present a male DB9 connector.

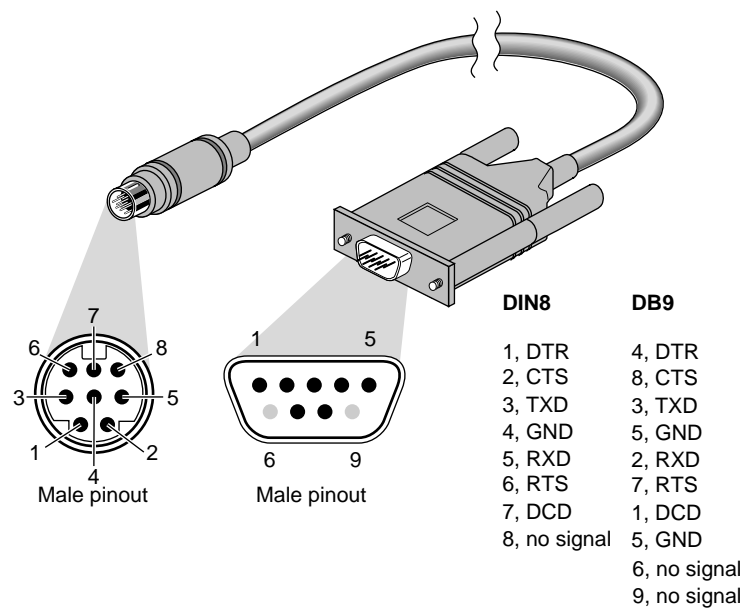


Figure 1-7 Mini-DIN8 to Male DB9 Adapter Cable: MAC-style or PC/AT-style Pinout

1.2.5 Panel Plate and LEDs

The panel plate has 4 Ethernet ports labeled **ef0**, **ef1**, **ef2**, **ef3** and 6 asynchronous serial ports labeled **tty_1**, **tty_2**, **tty_3**, **tty_4**, **tty_5**, **tty_6**. 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.

Note: Early versions of the board are labeled **0-3** for the Ethernet ports and **0-5** for the serial ports.

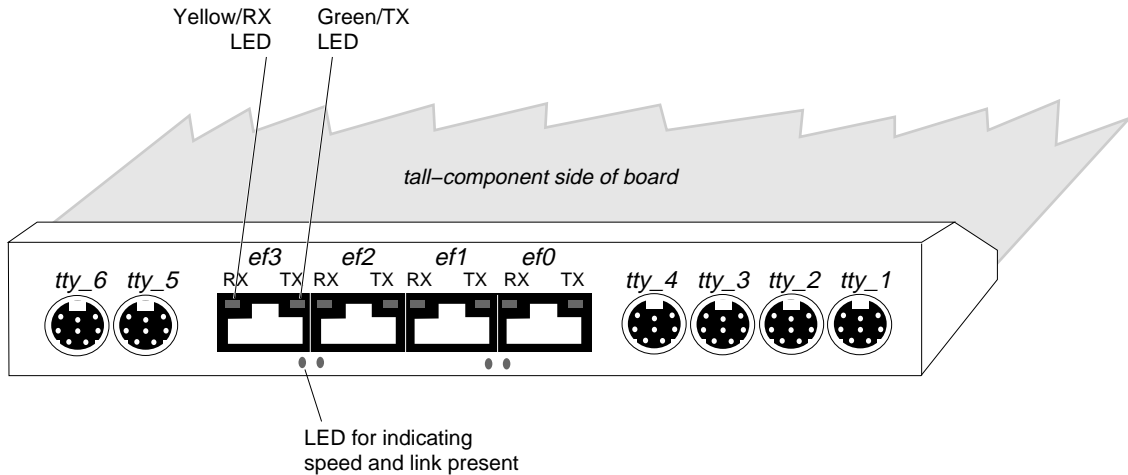


Figure 1-8 Panel Plate and LEDs for MENET/MSER XIO Board

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. On some boards, there is an LED near the corner of each Ethernet port, opposite to the other two LEDs. When this LED is yellow, the port is functioning at 100 Mbps; when it is green, the port is functioning at 10 Mbps; when OFF, there is no link (carrier detect) signal being seen on that port.

1.2.6 Maximum Number of MENET/MSER Boards

The maximum number of MENET/MSER XIO boards that can be installed into the different chassis and systems is summarized in Table 1-3.

Table 1-3 Maximum Number of MENET/MSER XIO Boards That Can Be Installed

System	Per Chassis	Per Fabric of 2 or More Interconnected Chassis
Origin2000 Deskside	2	interconnection is not supported
Onyx2 Deskside	2	interconnection is not supported
Origin2000 Rackmount	4	4
Onyx2 Rackmount	2	4

Note: A “fabric” is 2 or more chassis (that is, modules) that are interconnected with CrayLink™ Interconnect cables to form a single memory space.

1.2.7 Power Requirements

Table 1-4 summarizes the power consumption for the MENET/MSER XIO board.

Table 1-4 Power Requirements for MENET/MSER XIO Board

	Requirements
Average	TBD watts of power
Maximum	TBD volts at TBD amps, and TBD volts at TBD amps

1.2.8 Software

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

The serial drivers for the MSER ports are included in the *oe.sw.terminfo* and *oe.sw.uucp* images. For information about the IRIX serial drivers, see the online *serial(7)* reference (man) page. For information about testing serial ports, see the online *usrpcitest* reference page, which is included in the SSE-only software diagnostic image called *diag.sw.common*.

An example command line for the *usrpcitest* utility is shown below. This example tests RS-232 functionality using 100 internal loopbacks on an MENET/MSER board that is specified by its *hwgraph* path:

```
% /bin/usrpcitest -g /hw/module/1/slot/io9/menet/pci/4 -l 100 -L 0
```

Note: When invoking the *usrpcitest* utility with the *-n* option, use **menet** as the argument for the MENET/MSER board.

Installation Instructions for Origin2000 Deskside

This chapter describes the steps for installing an IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial (MENET/MSER) XIO board into a Origin2000 Deskside.

2.1 Verify All Parts Are Available

Before starting the installation, open the MENET/MSER XIO board box and verify that all the components are included. Table 2-1 lists the components.

Table 2-1 Component List for MENET/MSER XIO Board

Item	Quantity
IRIS MENET/MSER XIO Board in antistatic bag	1
Sheet of sticky labels for panel plate	1

2.2 Know How to Avoid Damaging the Board

Before starting the installation of the XIO board, do the following:

1. Know how to care for the compression connector on the board, as described in “Guidelines for Storing and Handling the Compression Connector on an XIO Board” in Chapter 1.
2. Understand the electrostatic discharge avoidance guidelines, as summarized in “Electrostatic Discharge” in Chapter 1.

2.3 Install and Configure Software

If your system is currently up and running, save yourself time and extra system reboots, by installing and configuring the correct version of IRIX before you install the new board. Follow the instructions below:

1. Verify that the correct version of IRIX is installed:

```
% versions eoe
I   eoe                date      IRIX Execution Environment, version
. . .
I   eoe.sw.unix        date      IRIX Execution Environment
I   eoe.sw.terminfo    date      Terminal Information Files
I   eoe.sw.uucp        date      UUCP Utilities
```

If these IRIX software subsystems are not installed or if the displayed *version* is earlier than 6.4, reinstall IRIX from the CD (or other source).

2. Follow the configuration instructions in the *IRIX Admin: Peripheral Devices* and *IRIX Admin: Networking and Mail* to configure (a) the software (IRIX drivers), and (b) the IP network interface for each IRIS Ethernet port (*ef#*).

Note: A system with 2 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*, etc.) are assigned to Ethernet ports in the following manner:

- *ef0* is assigned to the Ethernet port on the master BaseIO board in the system
- subsequent Ethernet ports are assigned numbers during bootup by the *ioconfig* utility. The numbers assigned to the ports on the MENET board are usually, but not always sequential; see the *ioconfig(1)* reference (man) page.

For information about using and configuring the various serial communication signalling styles for the ports on this board, see the online *serial(7)* reference (man) page.

2.4 Make System Safe

Before starting the installation, follow the instructions in this section to make the system and its surroundings physically safe.

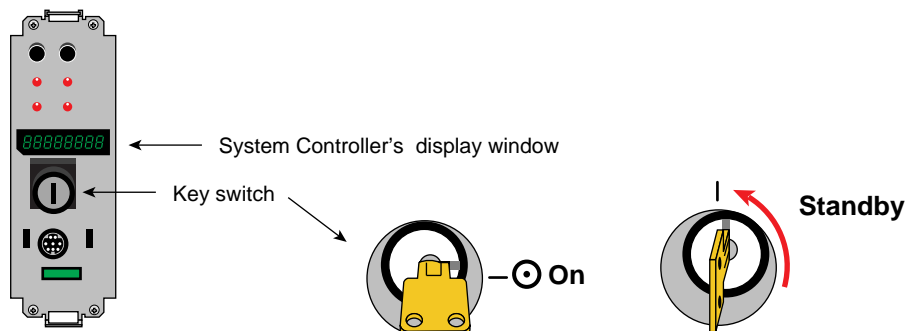


Warning: Failure to follow the instructions in this section can cause serious physical injury or death.

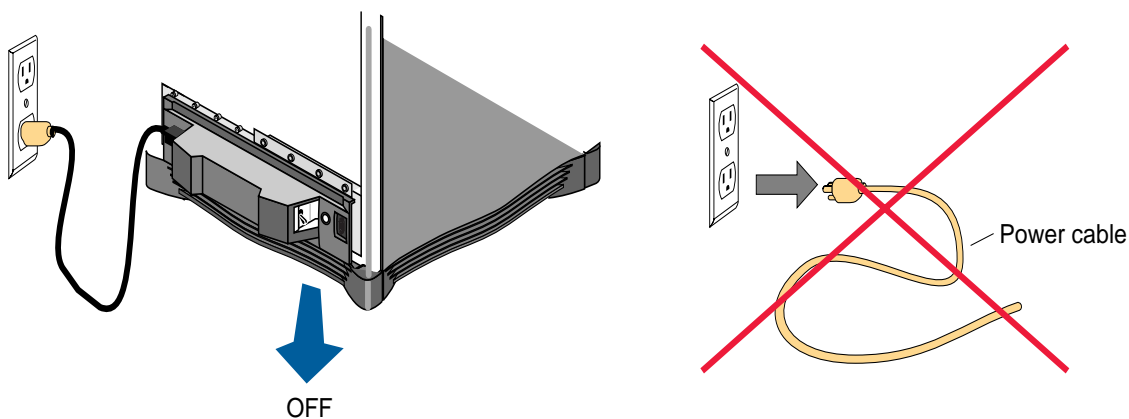
1. Shutdown the system:

```
% su
Password: the_password
# /etc/halt
```

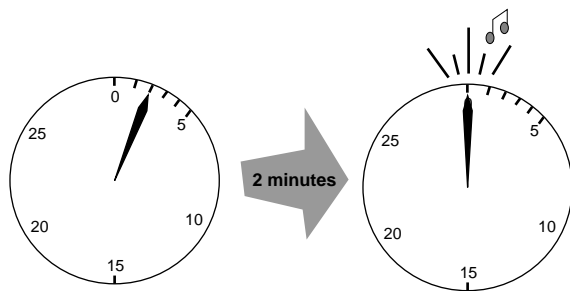
- When the message appears indicating that it is safe to turn the power off, turn the key switch on the System Controller to the STANDBY position.



- At the rear of the system, flip the power switch (circuit breaker) OFF (down). Do not disconnect the power plug.



- Wait 2 full minutes (after turning off the power) to allow the system's stored electrical charge to dissipate.



Warning: Failure to wait may cause serious injury or death due to electrocution from power stored within the system components.

2.5 Select and Prepare Slot

Follow the instructions in this section to select an appropriate XIO slot and prepare it for the installation.

1. Determine which XIO slots on the system are usable.

Depending on the power supplied to the system (110 or 220 volts), the number of Node boards, and the number of processors in the system, the count of usable XIO slots can be 6 or 12. Table 1-3 in Chapter 1, the *Origin2000 Deskside Owner's Guide*, and the *Origin2000 Deskside and Rackmount Installation Instructions* provide information that can help you determine which of the slots are activated and which can be used.

Note: In general, if an Origin2000 Deskside has a Node board in slot *N1* or *N3*, then XIO slots 1-6 are available. If it has a Node board in slot *N2* or *N4*, XIO slots 7-12 are available. If a chassis has at least two Node boards, one in *N1* or *N3* and one in *N2* or *N4*, then all 12 XIO slots are available.

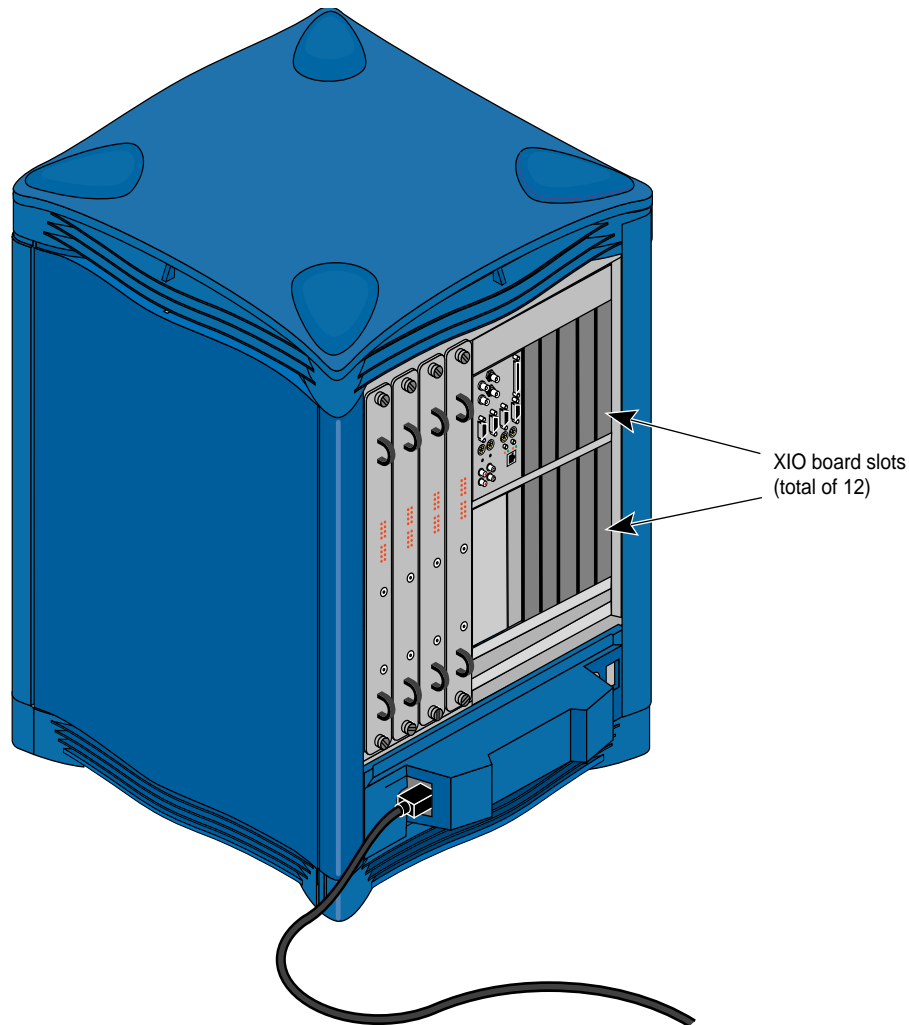


Figure 2-1 Rear of Origin2000 Deskside

2. Select a slot for the MENET/MSER XIO board.

The MENET/MSER board can be installed into any of the XIO slots, including slots 1 and 2 (illustrated in Figure 2-2) that are designed to accommodate the BaseIO and Internal PCI Adapter options.

In selecting a slot for the MENET/MSER board, it is recommended that you fill available odd-numbered slots before filling even-numbered ones, and that you fill lower-numbered slots before higher-numbered ones. For example, fill slot 3 before filling either slot 2 or slot 5, and fill slot 7 before slot 2.

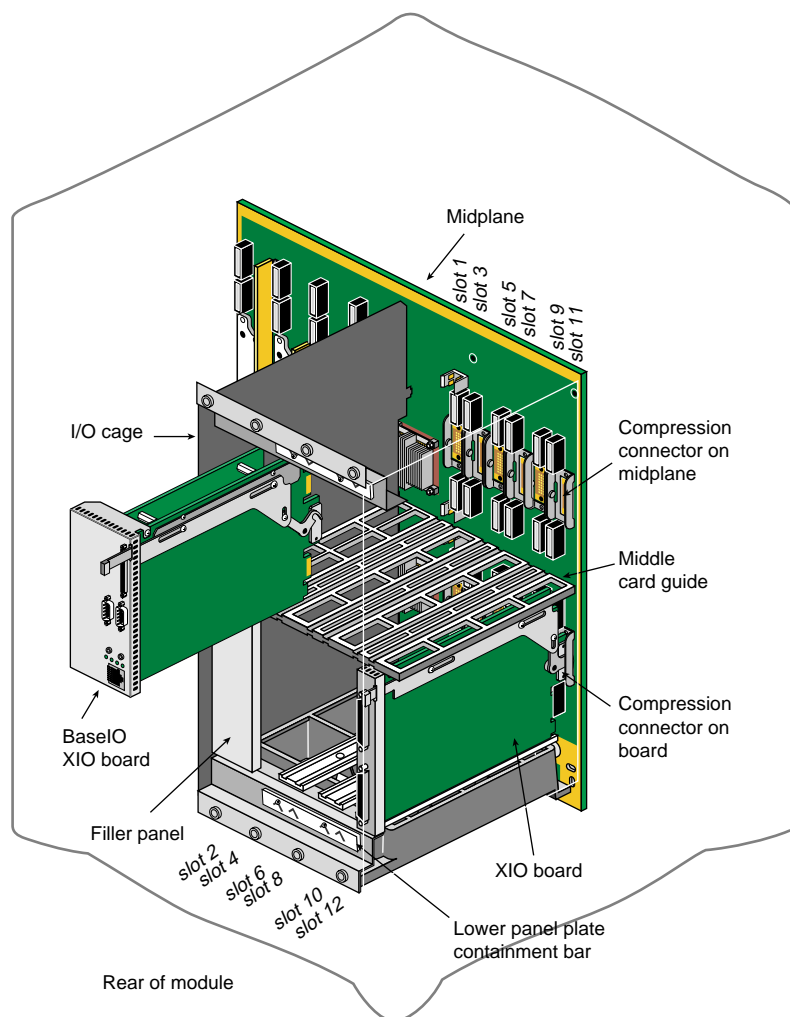


Figure 2-2 I/O Items in the Origin2000 Deskside Chassis

3. Ground yourself.

Caution: Failure to ground yourself may result in irreparable damage to or malfunction of the MENET/MSER board.

4. Locate the panel plate containment bar (illustrated in Figure 2-2) for the selected slot. For odd-numbered slots the bar is above the panel plates. For even-numbered slots, the bar is below them.

5. Use 4-6 turns to loosen each of the bar's screws.
6. Pop the bar outwards (pull towards you), then slide it away (up or down) from the panel plates. You will need to slide the bar over some rivets. The bar will snap into a holding position so that it stays out of the way.
7. For the selected slot, pull the knob of the blank panel plate to remove the blank XIO board. Store the blank board away.
8. Proceed to the next section, "Install MENET/MSER XIO Board."

2.6 Install MENET/MSER XIO Board

This section describes how to install the MENET/MSER board into its XIO slot.

1. Remove the board from its anti-static bag and place it on top of the bag.
2. Remove the protective cap from the board's compression connector, as illustrated in Figure 2-3. Save this cap. You will need it to cover the compression connector if you remove the board for any reason.

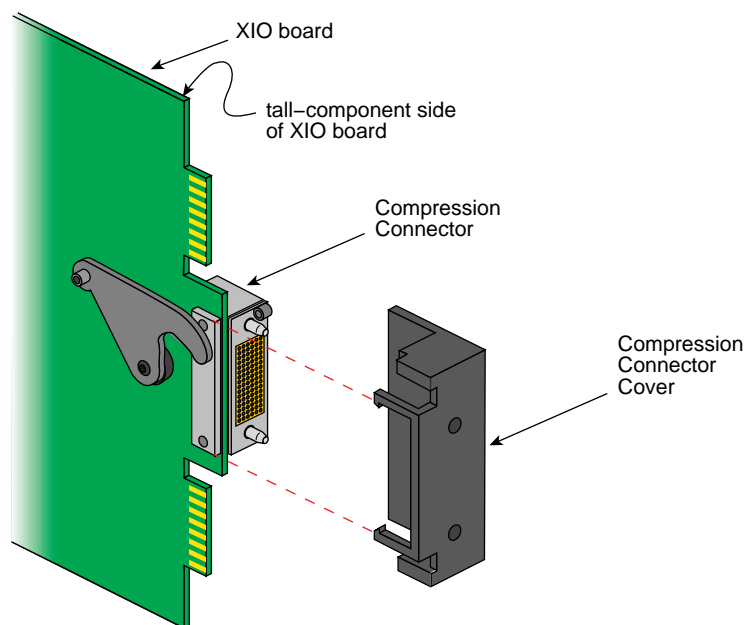


Figure 2-3 Removing the Protective Cap from the Compression Connector

3. Identify the tall-component side of the MENET/MSER XIO board. The tall-component side of the board is the side with the compression connector and the dual-SC receptacle.
4. Hold the board so that it is vertical and correctly oriented for the selected slot, as illustrated in Figure 2-4.

For slots 1, 2, 5, 6, 9, and 10:
the actuator handle is at the top, as illustrated in Figure 2-4.

For slots 3, 4, 7, 8, 11, and 12:
the actuator handle is at the bottom.

5. Pull the actuator handle, to open the compression connector hooks.

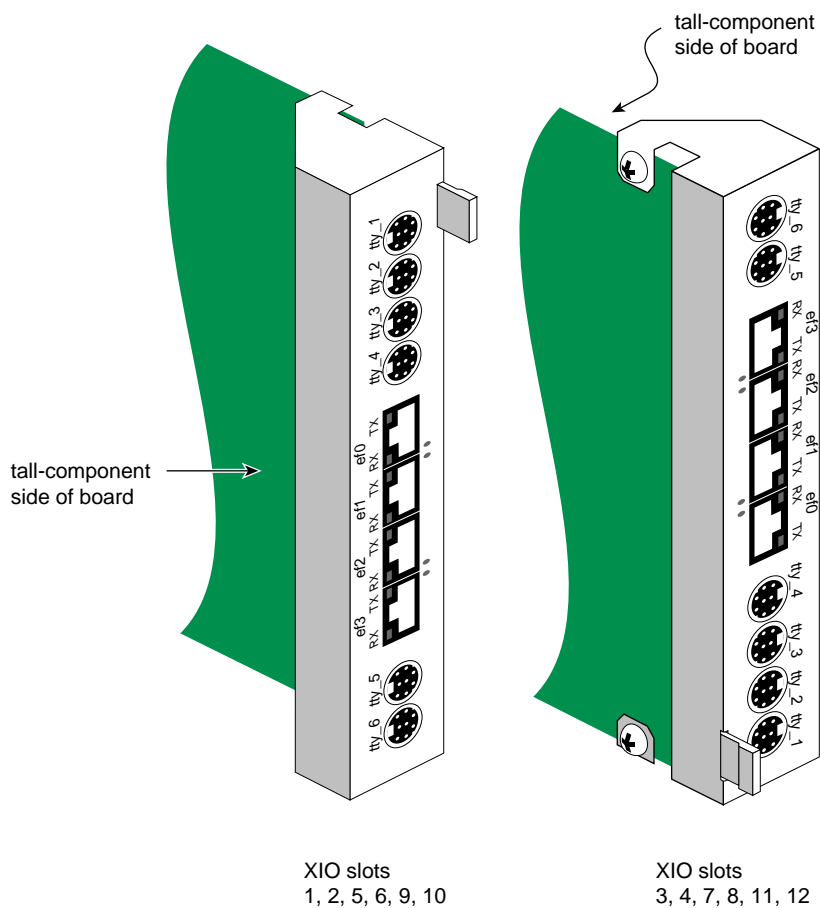


Figure 2-4 Proper Orientation for XIO Boards in Origin2000 Deskside Slots

6. Position the board between the card guides and slide it into the chassis.

Caution: Take care that no board components are damaged as you slide the board past other XIO boards in the chassis.
7. Verify that the board's panel plate is flush with the other panel plates. If it is not flush, check that the board is properly positioned between the card guides, then press gently until it is flush.
8. Push the hook actuator handle to lock the board to the midplane.

Firmly push the handle of the actuator until it stops. Pushing on this handle engages the compression connector's hook with its lock on the midplane.
9. Slide the containment bar back into place so that it holds the panel plates. Tighten its screws.
10. Remove your wrist strap and proceed to "Attach Cables."

2.7 Attach Cables

This section describes the attachment of external cables.

2.7.1 Ethernet Cables

1. For each configured IP network interface, identify the port on the MENET board that services that subnetwork.
2. For each configured interface, locate the site's Ethernet cable for that subnetwork.
Note: This external cable is supplied by the customer. External cables and all cabling must conform to either the 10Base-T or 100Base-TX specification. See "Site Cabling" in Chapter 1 for complete details.
3. Optional: put labels on the panel plate and the cables.
Note: Pay careful attention to this labeling. An Ethernet connection will not function if its configured IP address does not match the subnetwork address used by other systems on that cable.
4. Insert the cable's RJ-45 connector into the IRIS Fast Ethernet port.
5. Proceed to Section 2.7.2 or "Finish."

2.7.2 Serial Cables

1. For each serial peripheral device that you wish to attach, identify which port has been configured to service that device.
2. Select an appropriate cable for attaching the peripheral device to the mini-DIN8 serial port on the MSER XIO board. See "Site Cabling" in Chapter 1 for details.
3. Attach the cable.
4. Proceed to "Finish."

2.8 Finish

When the board is installed and connected, 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 *IRIX Admin:Networking and Mail*.

1. Flip the power switch ON.
2. Restart the system by turning the key in the System Controller to ON.
3. Logon.

4. 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 will not function until their network interfaces (*ef#*) have been configured.

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

5. If you have not installed and configured the IRIX serial (*tty*) software, do so now by following the instructions in the *IRIX Admin:Peripheral Devices* online document. The serial connections will not function until they have been configured.
6. Verify that the board's LEDs indicate normal operation, as described in "Panel Plate and LEDs" in Chapter 1.
7. Verify that the board has been located by the operating system during the bootup, with either of the following commands:

```
%hinv | grep 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 #
```

Note: In this example, the *ef0* entry belongs to the BaseIO board in XIO slot 1.

```
%hinv | grep "IOC3 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
```

Note: In this example, the *tty1* and *tty2* entries belong to the BaseIO board in XIO slot 1.

```
%find /hw/module | grep "menet/pci"
/hw/module/#/slot/io#/menet/pci/0/ef
/hw/module/#/slot/io#/menet/pci/1/ef
/hw/module/#/slot/io#/menet/pci/2/ef
/hw/module/#/slot/io#/menet/pci/3/ef
/hw/module/#/slot/io#/menet/pci/4/tty1
/hw/module/#/slot/io#/menet/pci/4/tty2
/hw/module/#/slot/io#/menet/pci/5/tty1
/hw/module/#/slot/io#/menet/pci/5/tty2
/hw/module/#/slot/io#/menet/pci/6/tty1
/hw/module/#/slot/io#/menet/pci/7/tty2
```

where the # after module and slot should correctly identify the chassis and XIO slot into which you installed the board. There will be other lines in this display; however you can ignore all but the ones listed here.

8. Verify that each connection is operational by following the verification tests described in the reference (man) page for the SSE-only *usrpcitest* utility, the online *IRIX Admin: Peripheral Devices* guide or the online *IRIS Admin: Networking and Mail* guide.

Chapter 3

Installation Instructions for Onyx2 Deskside

This chapter describes the steps for installing an IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial (MENET/MSER) XIO board into a Onyx2 Deskside.

3.1 Verify All Parts Are Available

Before starting the installation, open the box and verify that all the components are included. Table 3-1 lists the components.

Table 3-1 Component List for MENET/MSER XIO Board

Item	Quantity
IRIS MENET/MSER XIO Board in antistatic bag	1
Sheet of sticky labels for panel plate	1

3.2 Know How to Avoid Damaging the Board

Before starting the installation of the XIO board, do the following:

1. Know how to care for the compression connector on the board, as described in “Guidelines for Storing and Handling the Compression Connector on an XIO Board” in Chapter 1.
2. Understand the electrostatic discharge avoidance guidelines, as summarized in “Electrostatic Discharge” in Chapter 1.

3.3 Install and Configure Software

If your system is currently up and running, save yourself time and extra system reboots, by installing and configuring the correct version of IRIX before you install the new board. Follow the instructions below:

1. Verify that the correct version of IRIX is installed:

```
% versions eoe
I   eoe                date      IRIX Execution Environment, version
. . .
I   eoe.sw.unix        date      IRIX Execution Environment
I   eoe.sw.terminfo    date      Terminal Information Files
I   eoe.sw.uucp        date      UUCP Utilities
```

If these IRIX software subsystems are not installed or if the displayed *version* is earlier than 6.4, reinstall IRIX from the CD (or other source).

2. Follow the configuration instructions in the *IRIX Admin: Peripherals* and *IRIX Admin: Networking and Mail* to configure (a) the software (IRIX drivers), and (b) the IP network interface for each IRIS Ethernet port (*ef#*).

Note: A system with 2 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*, etc.) are assigned to Ethernet ports in the following manner:

- *ef0* is assigned to the Ethernet port on the master BaseIO board in the system
- subsequent Ethernet ports are assigned numbers during bootup by the *ioconfig* utility. The numbers assigned to the ports on the MENET board are usually, but not always sequential; see the *ioconfig(1)* reference (man) page.

For information about using and configuring the various serial communication signalling styles for the ports on this board, see the online *serial(7)* reference (man) page.

3.4 Make System Safe

Before starting the installation, follow the instructions in this section to make the system and its surroundings physically safe.

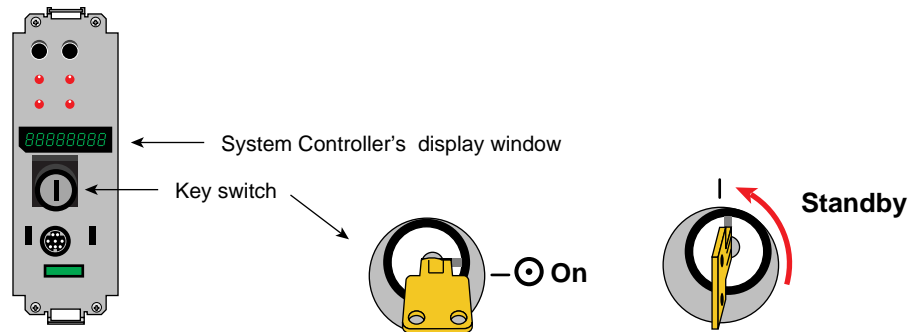


Warning: Failure to follow the instructions in this section can cause serious physical injury or death.

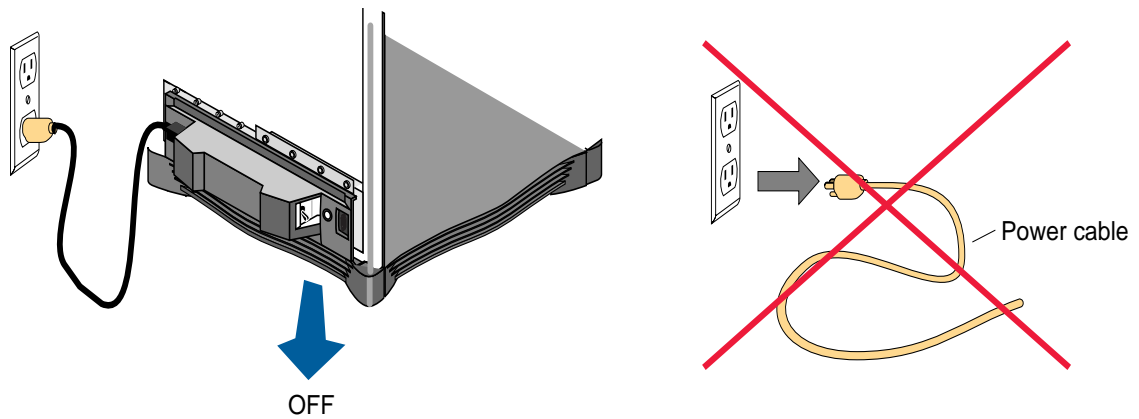
1. Shutdown the system:

```
% su
Password: the_password
# /etc/halt
```

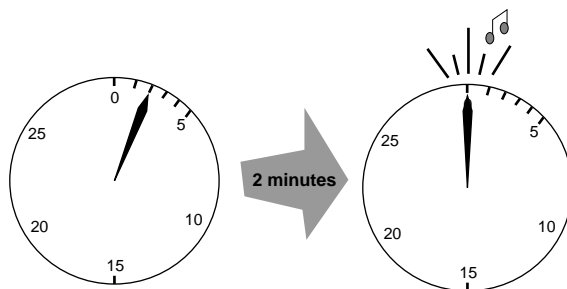
- When the message appears indicating that it is safe to turn off the power, turn the key switch on the System Controller to the STANDBY position.



- At the rear of the system, flip the power switch (circuit breaker) OFF (down). Do not disconnect the power plug.



- Wait 2 full minutes after turning off the power to allow the system's stored electrical charge to dissipate.



Warning: Failure to wait may cause serious injury or death due to electrocution from power stored within the system components.

3.5 Select and Prepare Slot

Follow the instructions in this section to select an appropriate XIO slot and prepare it for the installation.

1. Determine which XIO slots on the system are usable.

The Onyx2 Deskside (illustrated in Figure 3-1) has 6 XIO slots, of which 4 are available for optional XIO boards: 2, 3, 5, and 6.

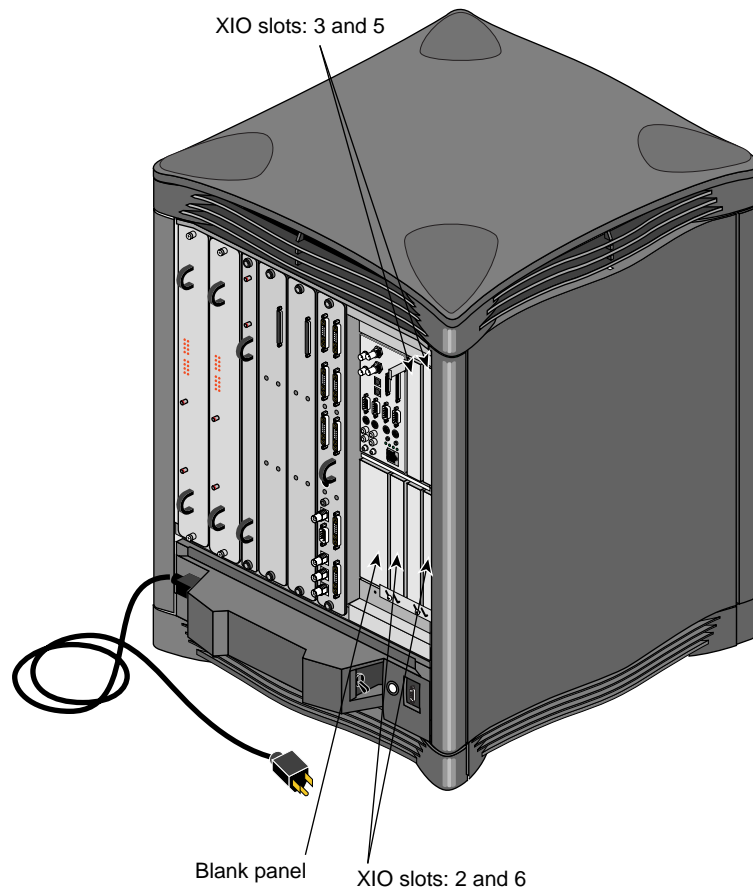


Figure 3-1 Rear of Onyx2 Deskside

2. Select a slot for the MENET/MSER board.

The MENET/MSER board can be installed into XIO slot 2, 3, 5, or 6 (illustrated in Figure 3-2). Slot 2 can accommodate either the MENET/MSER board or the Internal PCI Adapter (box) option.

Note: Slot 4 cannot be used for this board.

In selecting a slot, it is recommended that you fill available odd-numbered slots before filling even-numbered ones, and that you fill lower numbered slots before higher numbered ones. For example, fill slot 3 before filling either slot 2 or slot 5.

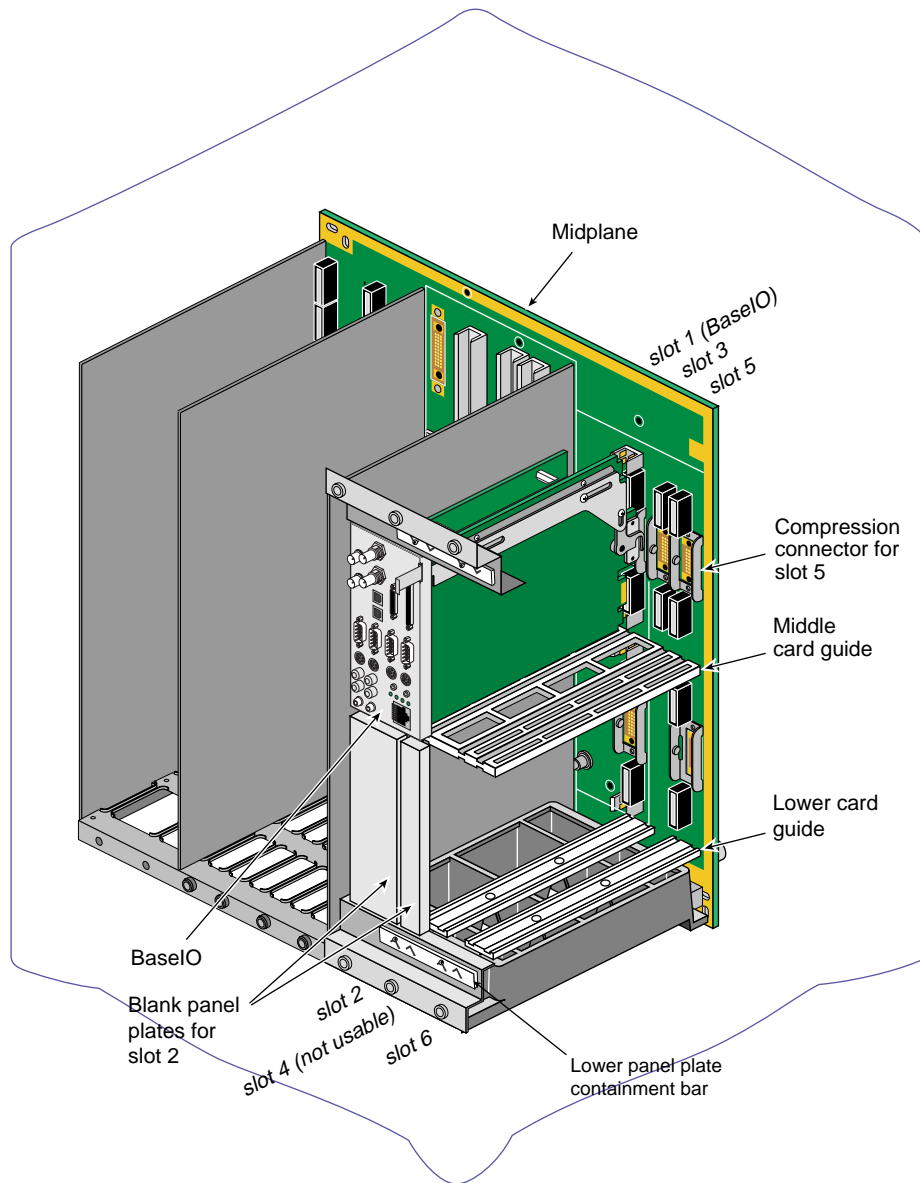


Figure 3-2 XIO Items in Onyx2 Deskside

3. Ground yourself.

Caution: Failure to ground yourself may result in irreparable damage to or malfunction of the XIO board.

4. Locate the panel plate containment bar (illustrated in Figure 3-2) for the selected slot. For odd-numbered slots the bar is above the panel plates. For even-numbered slots, the bar is below them.
5. Use 4-6 turns to loosen each screw along the bar.
6. Pop the bar outwards (pull towards you), then slide it away (up or down) from the panel plates. You will need to slide the bar over some rivets. The bar will snap into a holding position so that it stays out of the way.

7. For the selected slot, remove the blank XIO board. Store it away.
8. Proceed to “Install MENET/MSER XIO Board.”

3.6 Install MENET/MSER XIO Board

This section describes how to install the MENET/MSER board into its XIO slot.

Caution: Exposure to electrostatic discharge may irreparably damage the XIO board.

1. Remove the board from its anti-static bag and place it on top of the bag or on your antistatic work surface.
2. Remove the protective cap from the board's compression connector, as illustrated in Figure 3-3. Save this cap. You will need it to cover the compression connector if you remove the board for any reason.

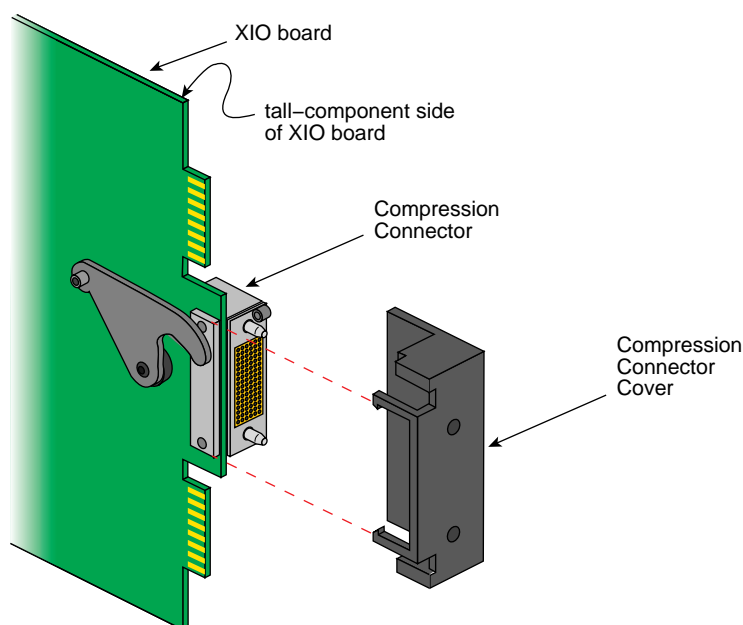


Figure 3-3 Removing the Protective Cap from the Compression Connector

3. Identify the tall-component side of the XIO board. The tall-component side of the board has the compression connector and the external receptacles.
4. Hold the board so that it is vertical and correctly oriented for the selected slot, as illustrated in Figure 3-4.

For slots 2, 5, and 6:
the actuator handle is at the top.

For slot 3:
the actuator handle is at the bottom.

5. Pull the actuator handle, to open the compression connector hooks.

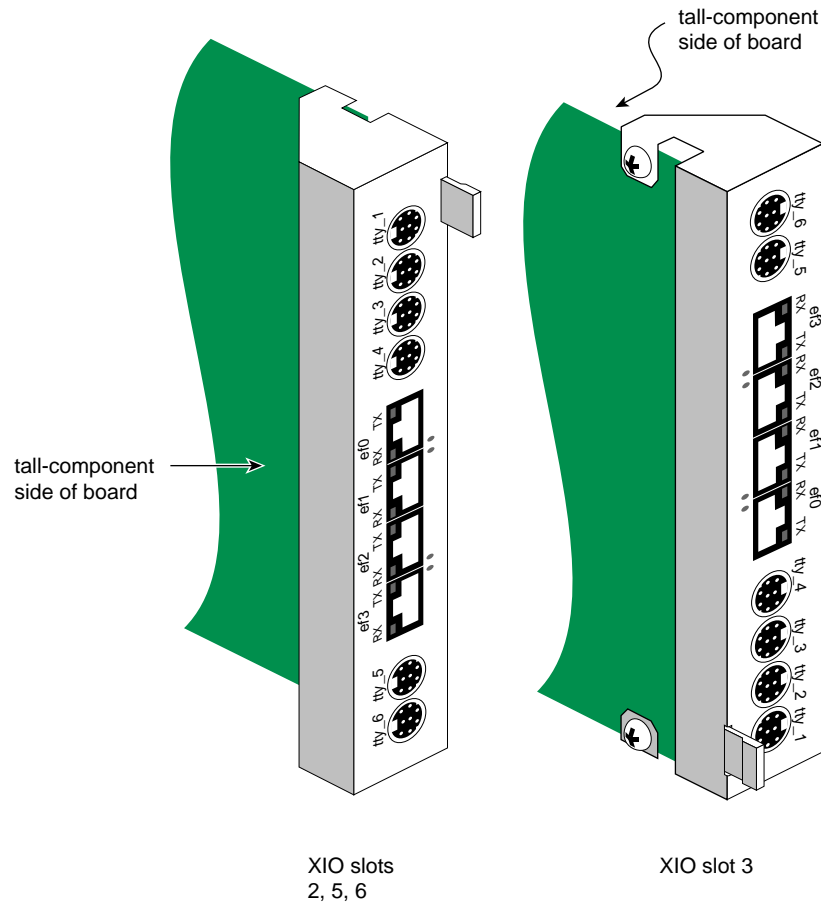


Figure 3-4 Proper Orientation for XIO Board in Onyx2 Deskside Slots

6. Position the board between the card guides and slide it into the chassis.

Caution: Take care that no board components are damaged as you slide the board past other XIO boards in the chassis.
7. Verify that the board's panel plate is flush with the other panel plates. If it is not flush, check that the board is properly positioned between the card guides, then press gently until it is flush.
8. Push the hook actuator handle to lock the board to the midplane.

Firmly push the handle of the actuator until it stops. Pushing on this handle engages the compression connector's hook with its lock on the midplane.
9. Slide the containment bar back into place so that it holds the panel plates. Tighten its screws.
10. Remove your wrist strap and proceed to "Attach Ethernet and Serial Cables."

3.7 Attach Ethernet and Serial Cables

This section describes the attachment of external cables.

3.7.1 Ethernet Cables

1. For each configured IP network interface, identify the port on the MENET board that services that subnetwork.
2. For each configured interface, locate the site's Ethernet cable for that subnetwork.
Note: This external cable is supplied by the customer. External cables and all cabling must conform to either the 10Base-T or 100Base-TX specification. See "Site Cabling" in Chapter 1 for complete details.
3. Optional: put labels on the panel plate and the cables.
Note: Pay careful attention to this labeling. An Ethernet connection will not function if its configured IP address does not match the subnetwork address used by other systems on that cable.
4. Insert the cable's RJ-45 connector into the IRIS Fast Ethernet port.
5. Proceed to Section 3.7.2 or "Finish."

3.7.2 Serial Cables

1. For each serial peripheral device that you wish to attach, identify which port has been configured to service that device.
2. Select an appropriate cable for attaching the peripheral device to the mini-DIN8 serial port on the MSER XIO board. See "Site Cabling" in Chapter 1 for details.
3. Attach the cable.
4. Proceed to "Finish."

3.8 Finish

When the board is installed and connected, 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 *IRIX Admin:Networking and Mail*.

1. Flip the power switch ON.
2. Restart the system by turning the key in the System Controller to ON.
3. Logon.

4. 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 will not function until their network interfaces (*ef#*) have been configured.

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

5. If you have not installed and configured the IRIX serial (*tty*) software, do so now by following the instructions in the *IRIX Admin:Peripheral Devices* online document. The serial connections will not function until they have been configured.
6. Verify that the board's LEDs indicate normal operation, as described in "Panel Plate and LEDs" in Chapter 1.
7. Verify that the board has been located by the operating system during the bootup, with either of the following commands:

```
%hinv | grep 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 #
```

Note: In this example, the *ef0* entry belongs to the BaseIO board in XIO slot 1.

```
%hinv | grep "IOC3 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
```

Note: In this example, the *tty1* and *tty2* entries belong to the BaseIO board in XIO slot 1.

```
%find /hw/module | grep "menet/pci"
/hw/module/#/slot/io#/menet/pci/0/ef
/hw/module/#/slot/io#/menet/pci/1/ef
/hw/module/#/slot/io#/menet/pci/2/ef
/hw/module/#/slot/io#/menet/pci/3/ef
/hw/module/#/slot/io#/menet/pci/4/tty1
/hw/module/#/slot/io#/menet/pci/4/tty2
/hw/module/#/slot/io#/menet/pci/5/tty1
/hw/module/#/slot/io#/menet/pci/5/tty2
/hw/module/#/slot/io#/menet/pci/6/tty1
/hw/module/#/slot/io#/menet/pci/7/tty2
```

where the # after module and slot should correctly identify the chassis and XIO slot into which you installed the board. There will be other lines in this display; however you can ignore all but the ones listed here.

8. Verify that each connection is operational by following the verification tests described in the reference (man) page for the SSE-only *usrpcitest* utility, the online *IRIX Admin: Peripherals* guide or the online *IRIS Admin: Networking and Mail* guide.

Installation Instructions for Origin2000 and Onyx2 Rackmount

This chapter describes the steps for installing an IRIS 4-Port Fast Ethernet Adapter with Asynchronous Serial (MENET/MSER) XIO board into a Origin2000 or Onyx2 Rackmount system.

4.1 Verify All Parts Are Available

Before starting the installation, open the shipping box and verify that all the components are included. Table 4-1 lists the components.

Table 4-1 Component List for MENET/MSER XIO Board

Item	Quantity
IRIS MENET/MSER XIO Board in antistatic bag	1
Sheet of sticky labels for panel plate	1

4.2 Know How to Avoid Damaging the Board

Before starting the installation of the XIO board, do the following:

1. Know how to care for the compression connector on the board, as described in “Guidelines for Storing and Handling the Compression Connector on an XIO Board” in Chapter 1.
2. Understand the electrostatic discharge avoidance guidelines, as summarized in “Electrostatic Discharge” in Chapter 1.

4.3 Install and Configure Software

If your system is currently up and running, save yourself time and extra system reboots, by installing and configuring the correct version of IRIX before you install the new board. Follow the instructions below:

1. Verify that the correct version of IRIX is installed:

```
% versions eoe
I   eoe                date      IRIX Execution Environment, version
. . .
I   eoe.sw.unix        date      IRIX Execution Environment
I   eoe.sw.terminfo    date      Terminal Information Files
I   eoe.sw.uucp        date      UUCP Utilities
```

If these IRIX software subsystems are not installed or if the displayed *version* is earlier than 6.4, reinstall IRIX from the CD (or other source).

2. Follow the configuration instructions in the *IRIX Admin:Peripheral Devices* and *IRIX Admin:Networking and Mail* to configure (a) the software (IRIX drivers), and (b) the IP network interface for each IRIS Ethernet port (*ef#*).

Note: A system with 2 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*, etc.) are assigned to Ethernet ports in the following manner:

- *ef0* is assigned to the Ethernet port on the master BaseIO board in the system
- subsequent Ethernet ports are assigned numbers during bootup by the *ioconfig* utility. The numbers assigned to the ports on the MENET board are usually, but not always sequential; see the *ioconfig(1)* reference (man) page.

For information about using and configuring the various serial communication signalling styles for the ports on this board, see the online *serial(7)* reference (man) page.

4.4 Select a Slot for the Board

Follow the instructions in this section to select an appropriate XIO slot. Table 4-2 summarizes the rules that must be followed during this selection process.

Table 4-2 Rackmount Slot Selection Rules for the MENET/MSER XIO Board

Description of Rule	Restriction
XIO slots that are physically compatible for installation of an MENET/MSER XIO board	all slots (that is, slots 1-12 in each chassis ^d)
Absolute maximum number of MENET/MSER XIO boards in one interconnected system of shared memory	4 boards
Absolute maximum number of MENET/MSER XIO boards in one Origin2000 Rackmount	2 boards
Absolute maximum number of MENET/MSER XIO boards in one Onyx2 Rackmount	2 boards
Absolute maximum number of MENET/MSER XIO boards in one chassis (module) of a rackmounted platform	2 boards

Table 4-2 Rackmount Slot Selection Rules for the MENET/MSER XIO Board

Description of Rule	Restriction
Recommended maximum number of MENET/MSER XIO boards in slots 1-6 or in slots 7-12 of a module	2 boards
a. Each Origin2000 Rackmount contains 2 chassis (one upper and one lower) that both provide XIO slots. Each Onyx2 Rackmount has 1 chassis that provides XIO slots.	
1. If installing the board into a system of interconnected racks, determine the rack into which you are going to install the board.	
2. Within the selected rack, determine which chassis (that is, the upper or the lower) you are going to work on.	
Note: In an Onyx2 Rackmount, the graphics chassis cannot accommodate any XIO boards; only the processor chassis has XIO slots.	
3. Determine which XIO slots in the selected chassis are usable. Figure 4-1 illustrates the XIO slots in a processor chassis.	

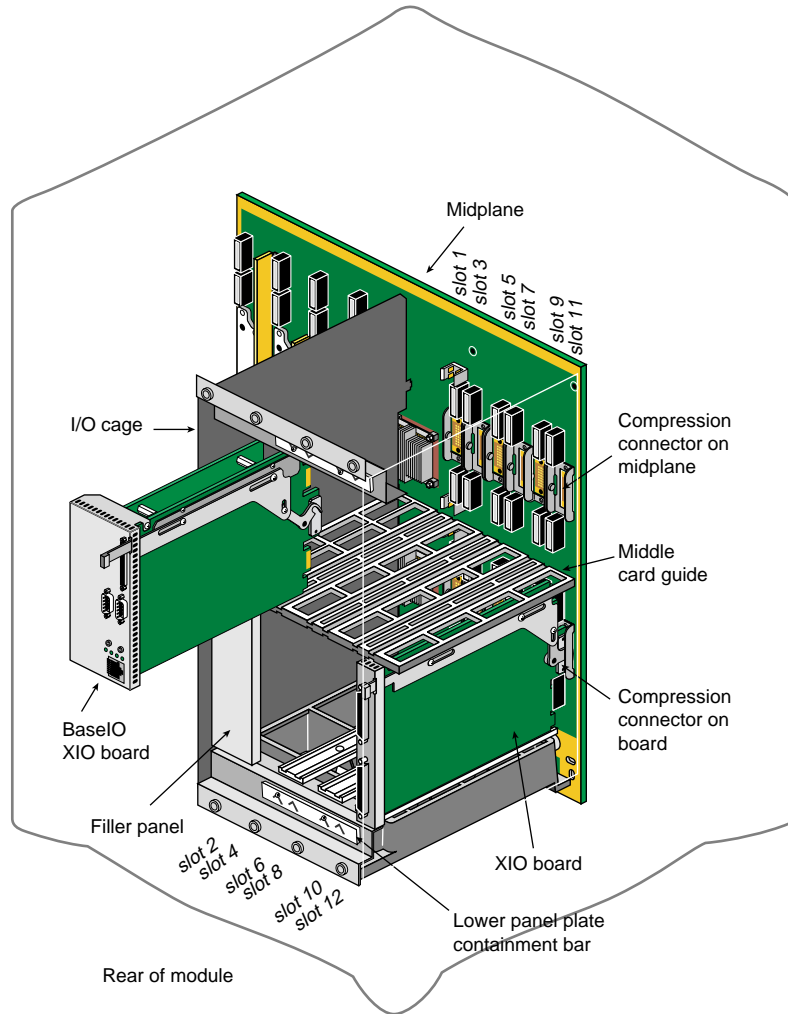


Figure 4-1 I/O Items in a Processor Module (Chassis) of an Origin2000 or Onyx2 Rackmount

Depending on the number of Node boards, the count of usable XIO slots in a chassis can be 6 or 12. The *Origin2000 Deskside and Rackmount Installation Instructions* or the *Onyx2 Rackmount Installation Instructions* provide information that can help you determine which of the slots are activated and which can be used.

Note: In general, if a chassis (module) has a Node board in slot *N1* or *N3*, then XIO slots 1-6 are available. If it has a Node board in slot *N2* or *N4*, XIO slots 7-12 are available. If a chassis has at least two Node boards, one in *N1* or *N3* and one in *N2* or *N4*, then all 12 XIO slots are available.

4. Select a slot for the MENET/MSER XIO board.

This board can be installed into any of the XIO slots, including slots 1 and 2 (illustrated in Figure 4-1) that are designed to accommodate the BaseIO and Internal PCI Adapter options.

In selecting a slot for the MENET/MSER board, it is recommended that you fill available odd-numbered slots before filling even-numbered ones, and that you fill lower-numbered slots before higher-numbered ones. For example, fill slot 3 before filling either slot 2 or slot 5, and fill slot 7 before slot 2.

4.5 Make System Safe and Prepare for the Installation

Follow the instructions in this section to make the system and its surroundings physically safe and to prepare the slot for installation. Figure 4-2 and Figure 4-3 illustrate the features on a rackmounted system that are most relevant to this task.



Warning: Failure to follow the instructions in this section can cause serious physical injury or death.

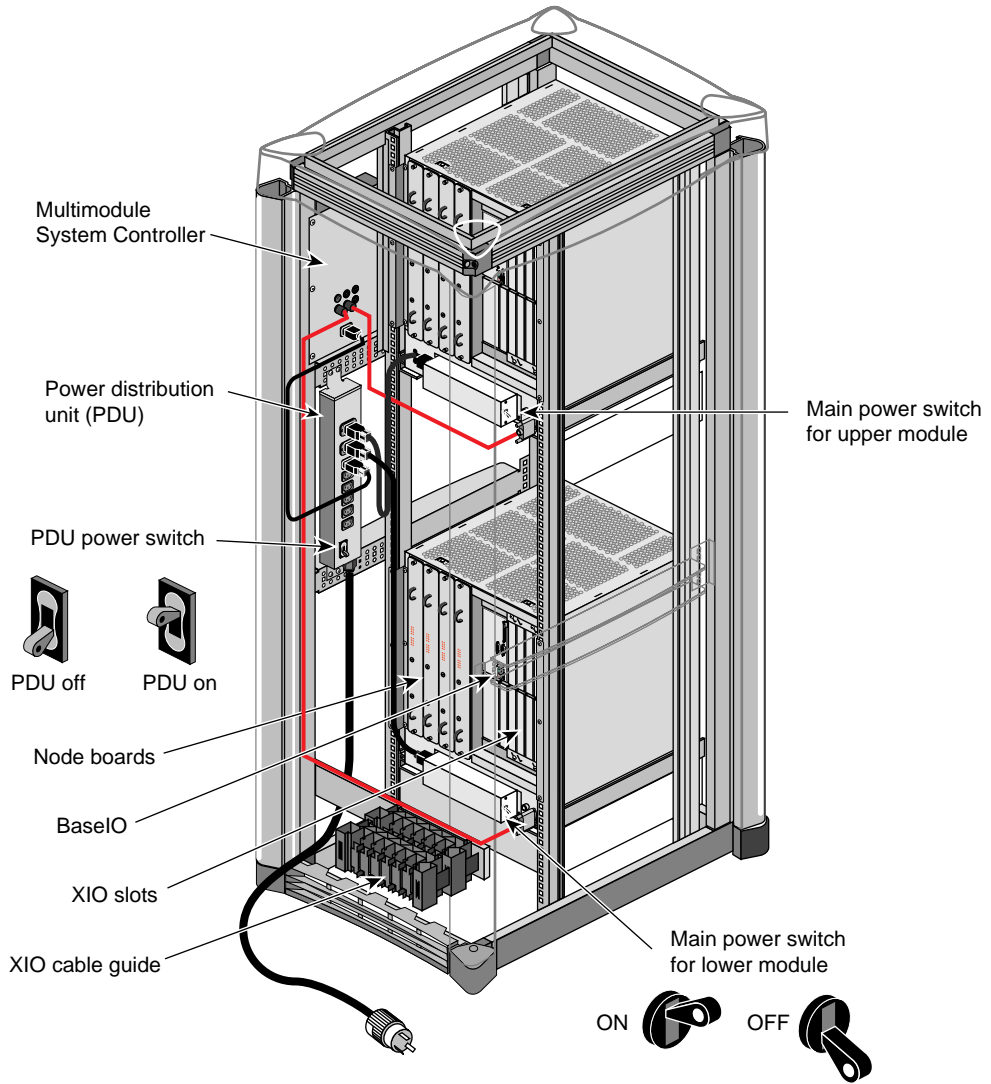


Figure 4-2 Rear of an Origin2000 Rackmount

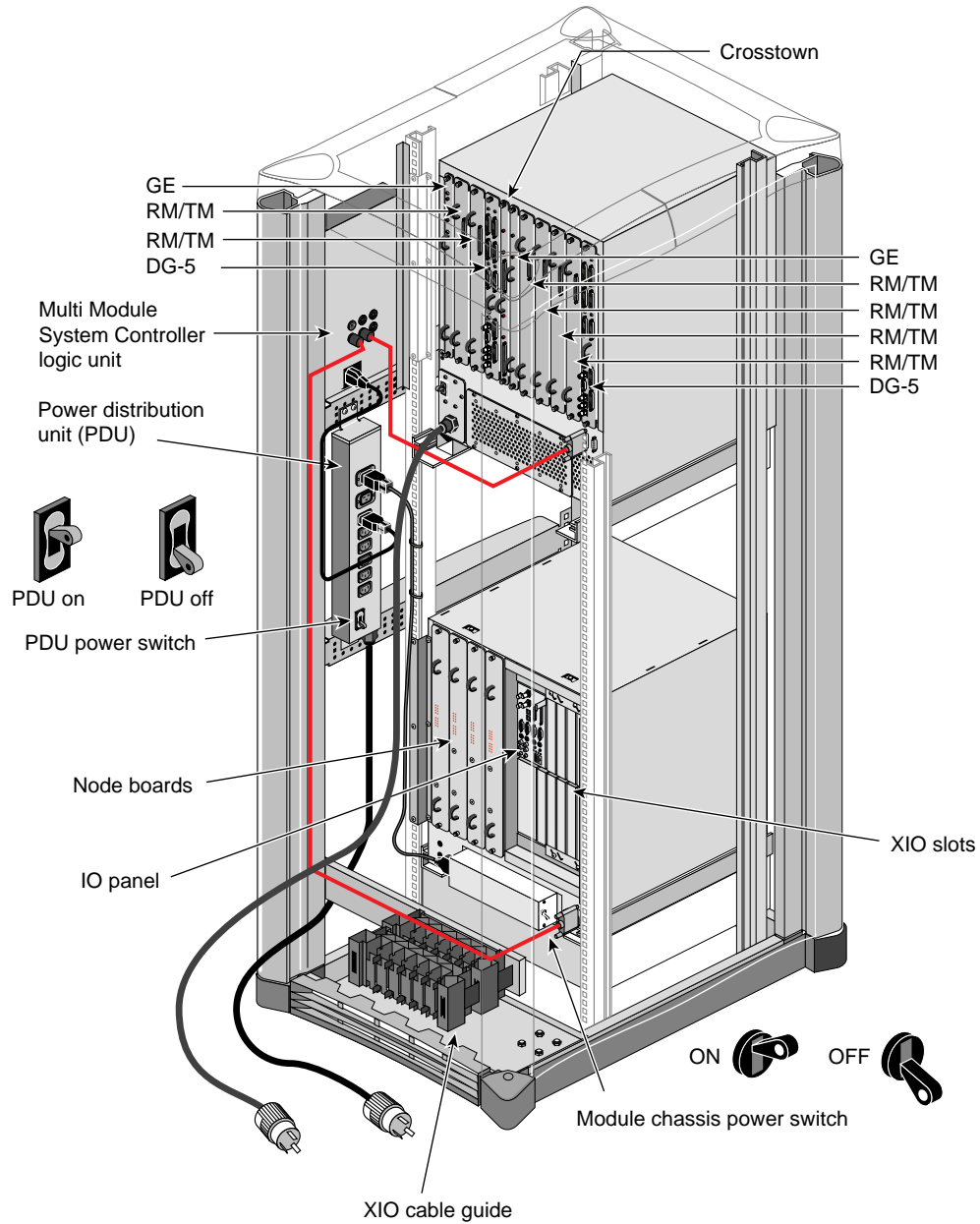


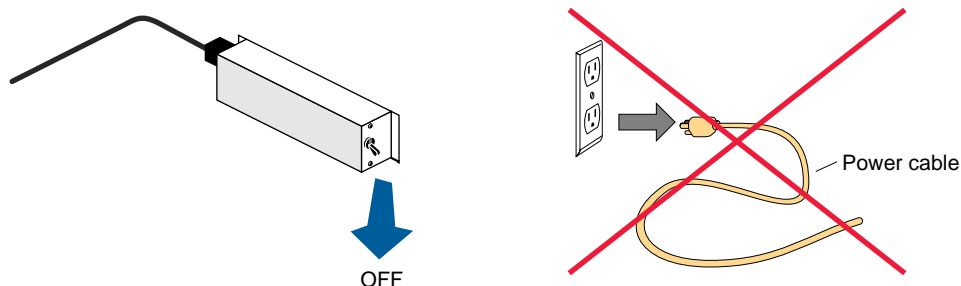
Figure 4-3 Rear of an Onyx2 Rackmount

1. Shutdown the software for the system:

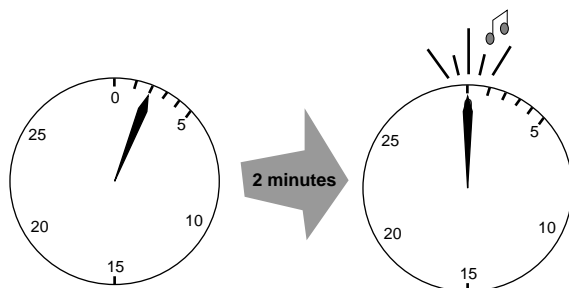
```
% su
Password: the_password
# /etc/halt
```

- When the message appears indicating that it is safe to power down the system, follow the appropriate set of power off instructions for the system's configuration. These instructions are located in chapter 10 of the *Origin2000 and Onyx2 Deskside and Rackmount Installation Instructions*.

Caution: Make sure that you have flipped the module's power switch OFF (down).



- Wait 2 full minutes after turning off the power to allow the chassis' stored electrical charge to dissipate.



Warning: Failure to wait may cause serious injury or death due to electrocution from power stored within the system components.

- Locate the panel plate containment bar (illustrated in Figure 4-1) for the selected slot. For odd-numbered slots the bar is above the panel plates. For even-numbered slots, the bar is below them.
- Use 4-6 turns to loosen each of the bar's screws.
- Pop the bar outwards (pull towards you), then slide it diagonally away (up or down) from the panel plates. You will need to slide the bar over some rivets. The bar will snap into a holding position so that it stays out of the way.
- For the selected slot, use the knob on the blank panel plate to pull the blank XIO board out of the slot. Store the blank board away.
- Proceed to the next section, "Install MENET/MSER XIO Board."

4.6 Install MENET/MSER XIO Board

This section describes how to install the MENET/MSER board into its XIO slot.

1. Ground yourself.
Caution: Failure to ground yourself may result in irreparable damage to or malfunction of the XIO board.
2. Remove the board from its anti-static bag and place it on top of the bag.
3. Remove the protective cap from the board's compression connector, as illustrated in Figure 4-4. Save this cap. You will need it to cover the compression connector if you remove the board for any reason.

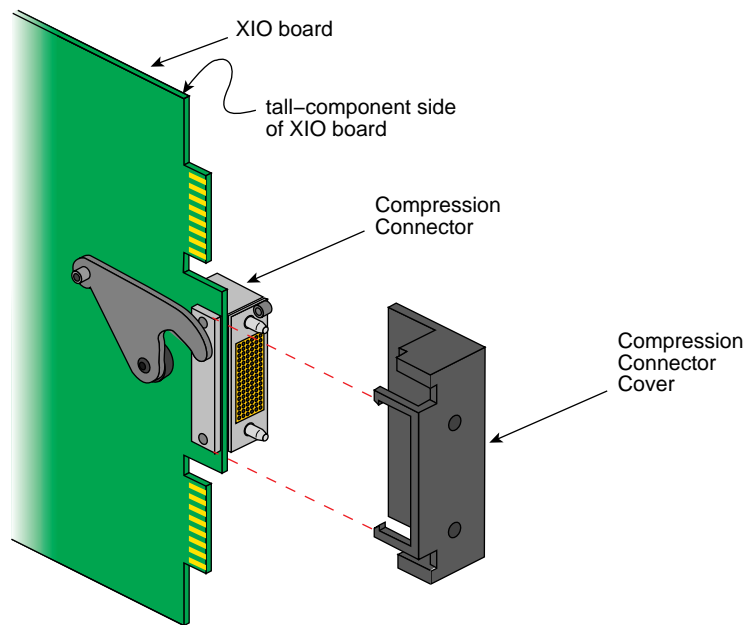


Figure 4-4 Removing the Protective Cap from the Compression Connector

4. Identify the tall-component side of the XIO board. The tall-component side of the board has the compression connector and the external receptacles.
5. Hold the board so that it is vertical and correctly oriented for the selected slot, as illustrated in Figure 4-5.
For slots 1, 2, 5, 6, 9, and 10:
the actuator handle is at the top.
For slots 3, 4, 7, 8, 11, and 12:
the actuator handle is at the bottom.
6. Pull the actuator handle, to open the compression connector hooks.

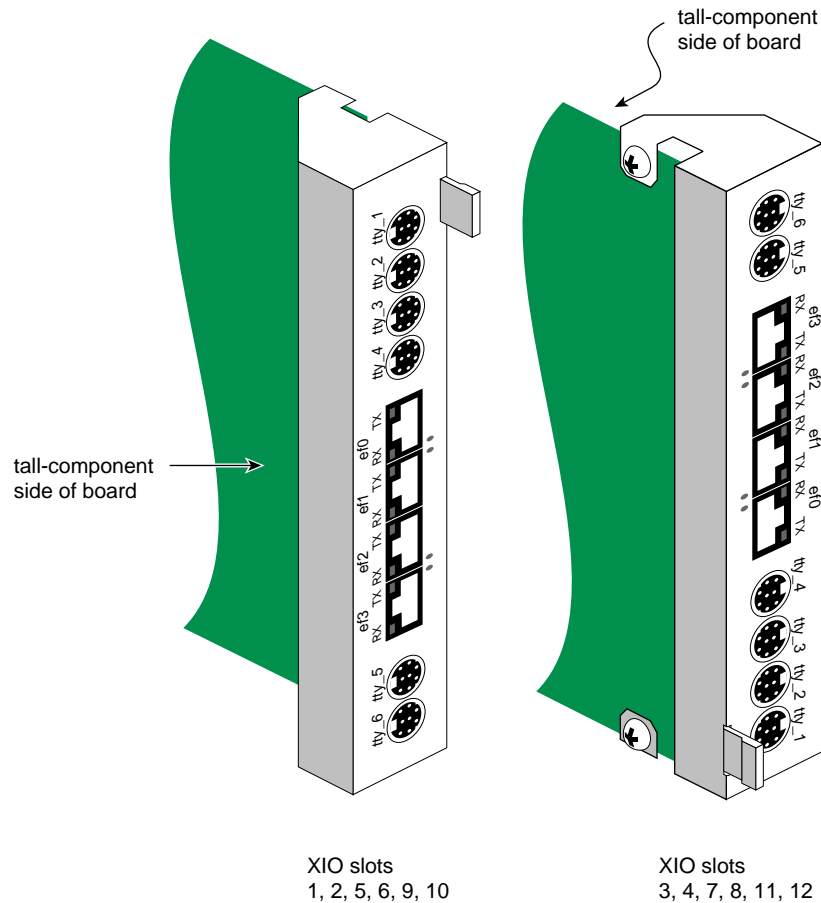


Figure 4-5 Proper Orientation for XIO Board in Slots

7. Position the board between the card guides. Slide it into the chassis.

Caution: Take care not to damage components on other XIO boards as you slide the board into the chassis.

8. Verify that the board's panel plate is flush with the other panel plates. If it is not flush, check that the board is properly positioned between the card guides, then press gently until it is flush.

Caution: Be firm, but gentle. Do not jiggle or rock the board. Do not apply excessive pressure. The compression connector (either on the board or on the midplane) could be irreparably damaged. If necessary, remove the board and start over.

9. Push the hook actuator handle to lock the board to the midplane.

Firmly push the handle of the actuator until it stops. Pushing on this handle engages the compression connector's hook with its lock on the midplane.

10. Reposition the containment bar and tighten its screws.

11. Remove your wrist strap and proceed to "Attach Ethernet and Serial Cables."

4.7 Attach Ethernet and Serial Cables

This section describes the attachment and placement of external cables into XIO cable management boxes. Figure 4-2 and Figure 4-3 illustrate all the cable management boxes available in a rack; Figure 4-6 illustrates upper module XIO cables arranged in one of the boxes.

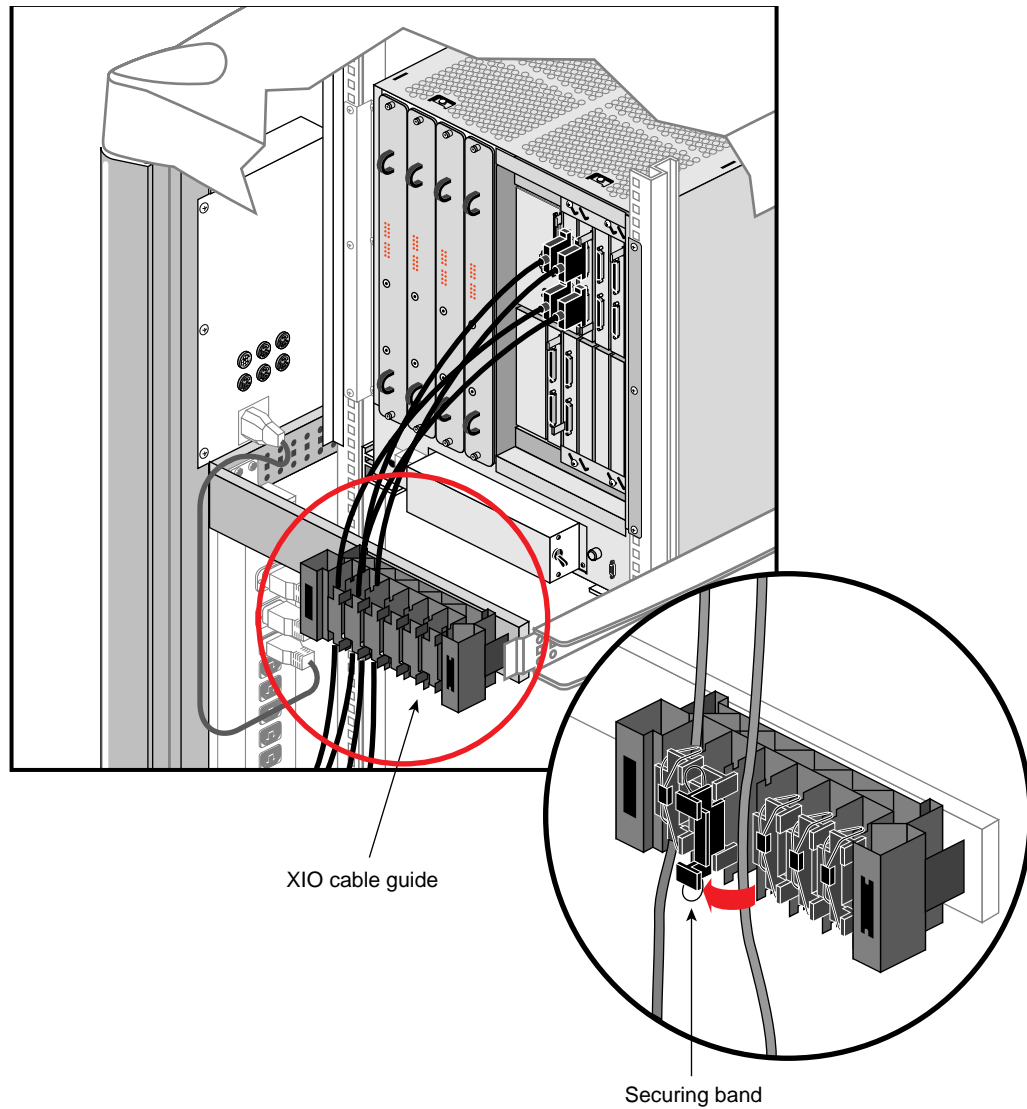


Figure 4-6 XIO Cable Management Box

4.7.1 Ethernet Cables

1. For each configured IP network interface, identify the port on the MENET board that services that subnetwork.
2. For each configured interface, locate the site's Ethernet cable for that subnetwork.

Note: This external cable is supplied by the customer. External cables and the site's network installation must conform to the appropriate specification for the speed being used on the local area network. See "Site Cabling" in Chapter 1 for complete details.

3. Optional: put labels on panel plate and cables.

Note: Pay careful attention to this labeling. The Ethernet connection will not function if its configured IP address does not match the subnetwork address used by other systems on that cable.

4. Insert the cable's RJ-45 connector into the IRIS Fast Ethernet port.
5. Arrange the cable in the appropriate cable management box.

Open one stable by flipping the looped ends of the securing band (o-ring) out of the slots on the stable dividers, and swinging the door outward, as illustrated in Figure 4-7.

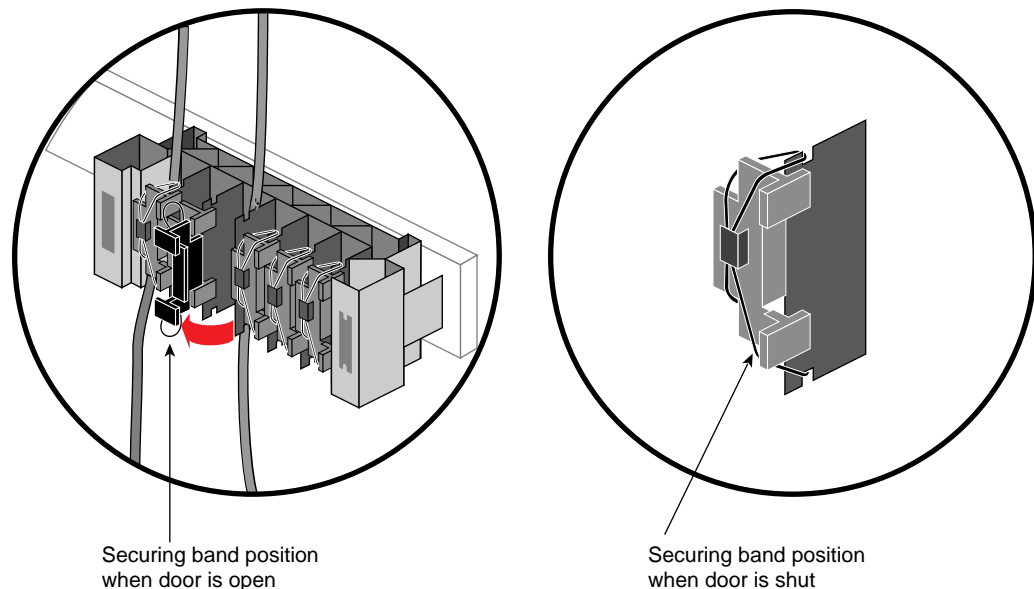


Figure 4-7 Door Operation for XIO Cable Management Box

For cables coming from the upper module, the cable should be placed into 2 stables: one in the upper box and one in the outward-facing lower box.

For cables from the lower module, the cable should be placed in the interior-facing bottom box. (To access this box, pop the exterior box off and push it aside.)

6. Close the stable door.

Press and hold the plastic door shut. Slip the looped ends of the band into the upper and lower slots of the dividers, as illustrated in Figure 4-7.

7. Proceed to Section 4.7.2 or to “Finish.”

4.7.2 Serial Cables

1. For each serial peripheral device that you wish to attach, identify which port has been configured to service that device.
2. Select an appropriate cable for attaching the peripheral device to the mini-DIN8 serial port on the MSER XIO board. See “Site Cabling” in Chapter 1 for details.
3. Attach the cable.
4. Arrange the cable in the appropriate cable management box.

Open one stable by flipping the looped ends of the securing band (o-ring) out of the slots on the stable dividers, and swinging the door outward, as illustrated in Figure 4-7.

For cables coming from the upper module, the cable should be placed into 2 stables: one in the upper box and one in the outward-facing lower box.

For cables from the lower module, the cable should be placed in the interior-facing bottom box. (To access this box, pop the exterior box off and push it aside.)

5. Close the stable door.

Press and hold the plastic door shut. Slip the looped ends of the band into the upper and lower slots of the dividers, as illustrated in Figure 4-7.

6. Proceed to “Finish.”

4.8 Finish

When the board is installed and connected, 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 *IRIX Admin:Networking and Mail*.

1. Power on the system. Follow the appropriate power on instructions for the system's configuration. These instructions are located in the “Installation” chapter of the *Origin2000 and Onyx2 Deskside and Rackmount Installation Instructions*.
2. Logon.
3. 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 will not function until their network interfaces (*ef#*) have been configured.

Note: After you finish configuring the software, you will need to reboot the system (or run the *autoconfig* command) to build a new operating system (kernel) that includes the new driver. Then, you will need to again reboot the system 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 *IRIX Admin:Peripheral Devices* online document. The serial connections will not function until they have been configured.
5. Verify that the board's LEDs indicate normal operation, as described in "Panel Plate and LEDs" in Chapter 1.
6. Verify that the board has been located by the operating system during the bootup, with either of the following commands:

```
%hinv | grep 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 #
```

Note: In this example, the *ef0* entry belongs to the BaseIO board in XIO slot 1.

```
%hinv | grep "IOC3 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
```

Note: In this example, the *tty1* and *tty2* entries belong to the BaseIO board in XIO slot 1.

```
%find /hw/module | grep "menet/pci"
/hw/module/#/slot/io#/menet/pci/0/ef
/hw/module/#/slot/io#/menet/pci/1/ef
/hw/module/#/slot/io#/menet/pci/2/ef
/hw/module/#/slot/io#/menet/pci/3/ef
/hw/module/#/slot/io#/menet/pci/4/tty/1
/hw/module/#/slot/io#/menet/pci/4/tty/2
/hw/module/#/slot/io#/menet/pci/5/tty/1
/hw/module/#/slot/io#/menet/pci/5/tty/2
/hw/module/#/slot/io#/menet/pci/6/tty/1
/hw/module/#/slot/io#/menet/pci/7/tty/2
```

where the # after module and slot should correctly identify the chassis and XIO slot into which you installed the board. There will be other lines in this display; however you can ignore all but the ones listed here.

7. Verify that each connection is operational by following the verification tests described in the reference (man) page for the SSE-only *usrpcitest* utility, the online *IRIX Admin:Peripheral Devices* guide or the online *IRIS Admin:Networking and Mail* guide.