IRIS® ATM-OC3c 4Port XIO™ Board Installation Instructions for Origin2000™ and Onyx2™

Document Number 108-0159-003

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Document Number 108-0159-003

Silicon Graphics, Inc.
Mountain View, California

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About This Document

This guide provides instructions for installing the IRIS ATM-OC3c 4Port XIO Board. Each chapter describes the installation steps for a different Silicon Graphics chassis: Origin2000 Deskside, Onyx2 Deskside, and rackmount systems that have XIO slots.

Note: These instructions are written for system service engineers (SSEs) who have been trained by Silicon Graphics. 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 ATM-OC3c 4Port XIO board provides four Asynchronous Transfer Mode (ATM) full-duplex communication connections that each operate at 155.52 megabits per second (OC3c) in each direction. The ports can all be attached to the same ATM switch, or they can use different switches. For each port, the design includes 4 MBytes of onboard buffer memory and 512 KBytes of separate, onboard control memory. The board provides ATM adaptation layer 5 (AAL5) over a Synchronous Optical Network (SONET) physical layer.

The IRIS ATM software that accompanies this board provides permanent virtual channels (PVCs) and/or switched virtual channels (SVCs) with or without ATM signalling and local network management (ILMI). The IRIS ATM software is described in the online *IRIS ATM Configuration Guide*. Applications can use the services of the IRIS ATM board via the standard TCP/IP interface or through the board's application programming interface (API), described in the online *IRIS ATM API Programmer's Guide*.

For an IRIS ATM port to function, it must be connected to a port on an ATM switch with appropriate multi-mode fiber-optic cabling. The end of the cable attached to the IRIS ATM-OC3c 4Port board's I/O panel plate must be terminated with a dual-SC connector. Cabling and switches are not included with the product and are the customer's responsibility. Site cabling requirements are described in "Site Cabling" in Chapter 1 of this document, and all site cabling must meet the physical layer specification for ATM over SONET-STS3c, as described in the *ATM User-Network Interface Specification*, version 3.0 or 3.1, the section titled "Physical Layer for 155 Mbps Interface."

Chapter 1

Overview and Care of the Board

1.1 Introduction to XIO Boards

This section describes the care and handling of XIO board.

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 are installed into the XIO slots of Origin2000 and Onyx2 systems. Each active XIO slot provides up to 1600 megabytes per second of bi-directional bandwidth (that is, 800 megabytes in each direction) through a nonblocking crossbar switch located on the system's midplane. A specific XIO product may use a portion or all of this available bandwidth on each of its XIO ports. 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) in common:

Compression connector
: Connector that provides communication between the board and the system via the midplane or frontplane.

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
: External surface that provides cutouts for external cables and light-emitting diodes (LEDs).

Tall-component side
: Surface of the board that has the compression connector and the tallest components.

Short-component side
: Side of the board with only low-profile components.

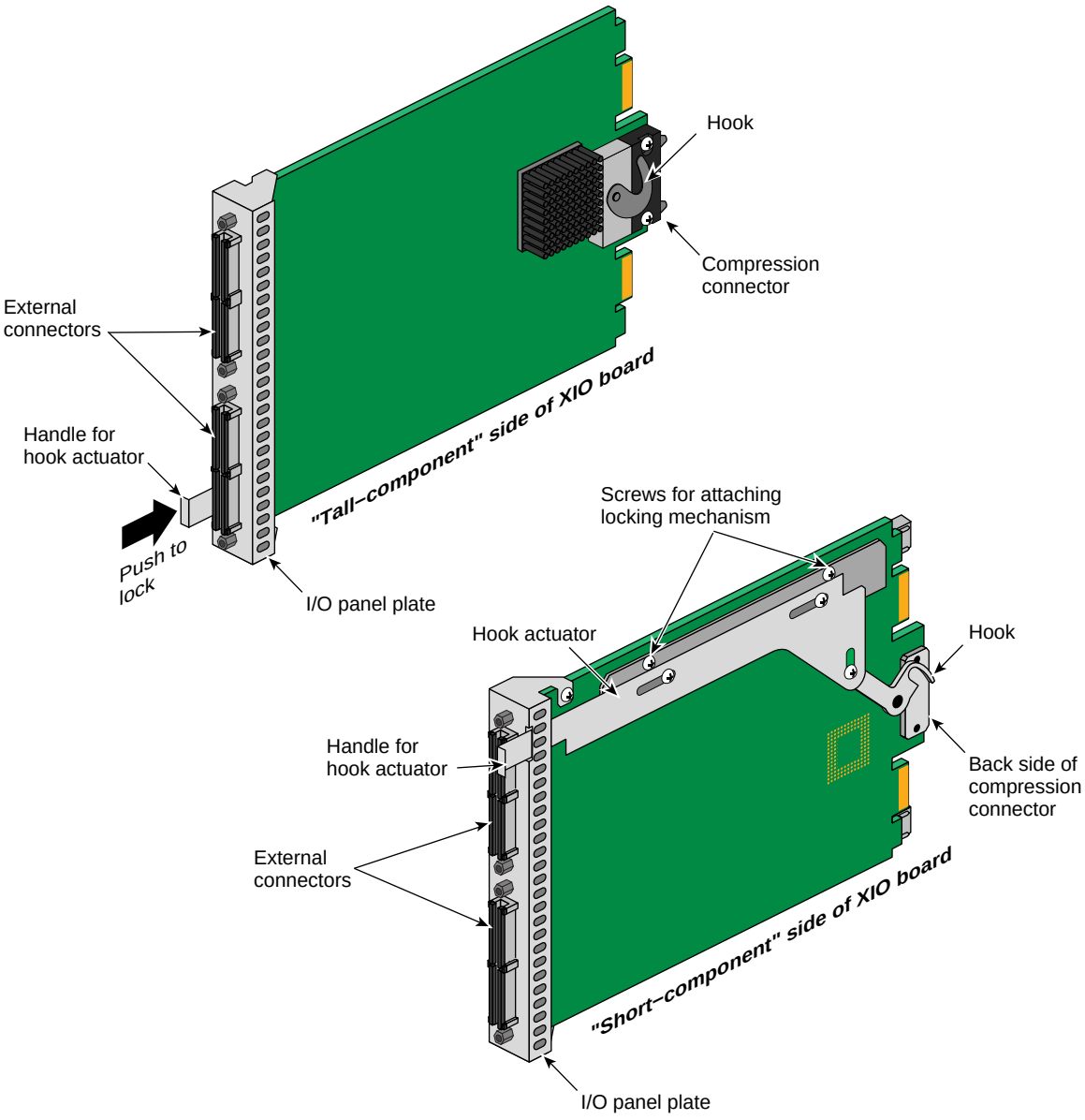


Figure 1-1 Generic XIO Board

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 two hooks (one on each side of the compression connector). A hook actuator presses against one of the hooks, thus moving both of the hooks into and out of their locked position. The design and placement 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 lever-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 two parts: one is physically located on the XIO board (illustrated in Figure 1-2); the other 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.

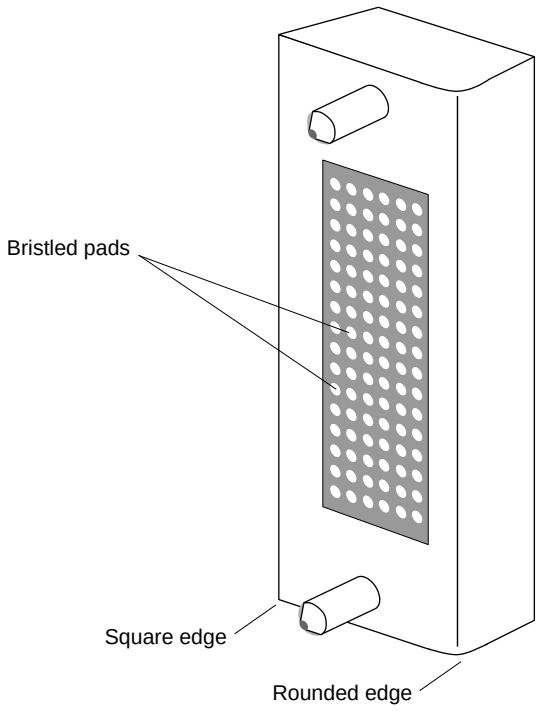


Figure 1-2 The Compression Connector Used on XIO Boards

The bristled pads can attract and hold dust, lint, grease, powder, and dirt. These substances clog or damage the bristles and prevent 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 on a surface, make sure that the surface is free of dust, lint, powder, metal filings, oil, water, and similar materials.
- 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 cleaning, if you keep the protective cover on whenever the XIO board is not installed. However, if the connector becomes dirty, follow these instructions 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) is the only product that Silicon Graphics currently recommends for this application.

   Caution: Do not use a cleaning product that contains any of the following ingredients: halogenated hydrocarbons, aromatic hydrocarbons, ethers, sulphur, ketones, or solvents of any kind. These substances can 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 in a vertical position. During subsequent steps, it is important to maintain this vertical position because this helps prevent the non-inert material (expeller gases) from being expelled.

   Caution: Tipping or shaking the can while spraying can result in damage to the compression connector from the product's expeller gases.
4. Place or hold the XIO board so that the rounded edge of the compression connector faces up. Note that the rounded edge is completely closed, so that air cannot flow into the connector, whereas the squared edge has an opening.

   Caution: Spraying into the squared (open) edge of the connector can destroy it.
5. Position the XIO board at an angle to the can, with the tip of the can's applicator is 1 to 2 inches away from the topmost row of pads (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.

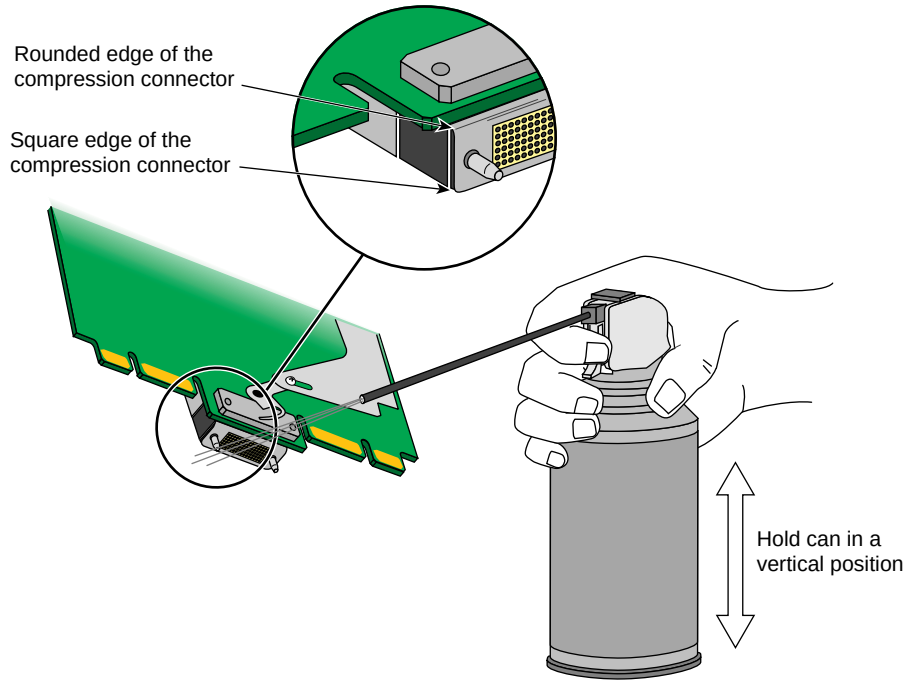


Figure 1-3 Position for Compressed Air Can When Cleaning Compression Connector

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 and switch to a new can 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.

1.2 Overview of ATM-OC3c 4Port XIO Board

This section describes the IRIS ATM-OC3c 4Port XIO board.

1.2.1 Block Diagram of ATM-OC3c XIO Board

The IRIS ATM-OC3c XIO Board can be logically divided into five sections: the section for interfacing to the system (including the compression connector and the Bridge Chip) and four ATM data flow and interface sections, one for each port. Figure 1-4 illustrates these five sections and the logical paths taken by the data for each port. Figure 1-5 identifies the placement of components on the board.

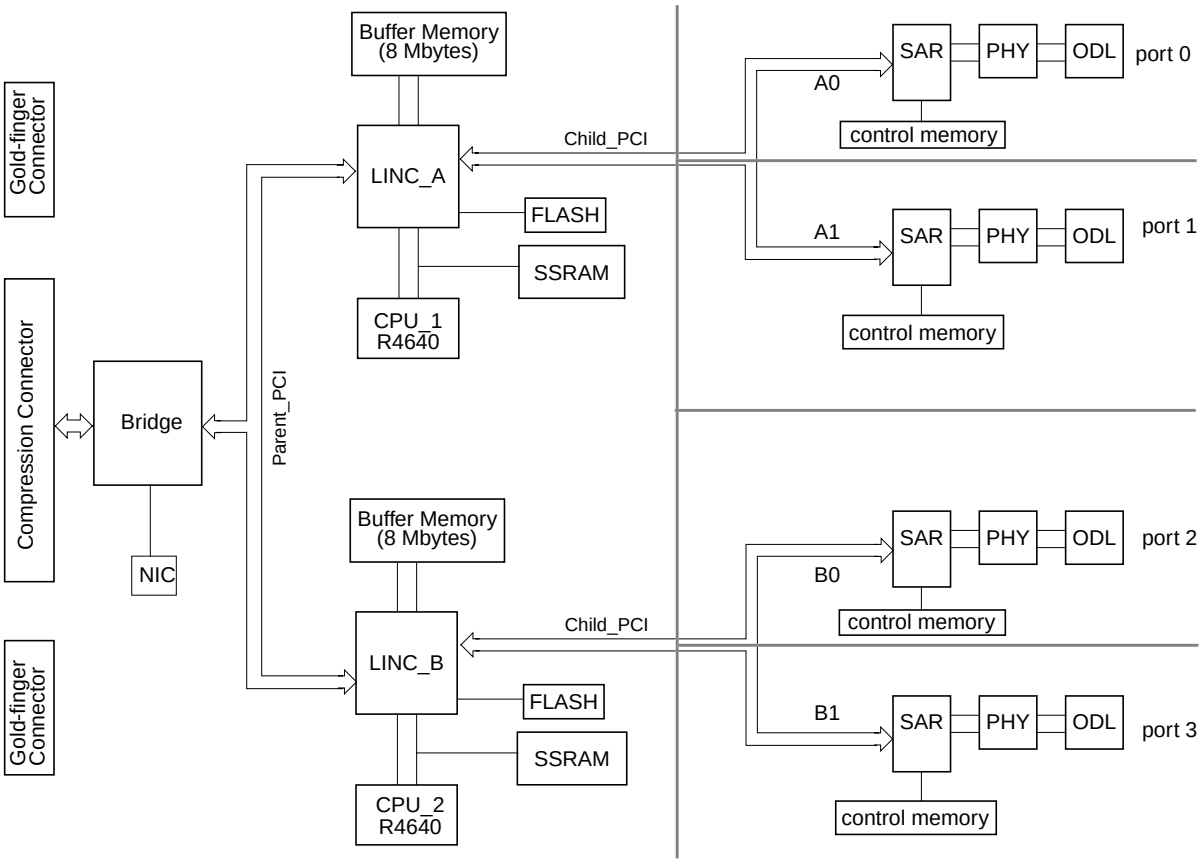


Figure 1-4 Block Diagram of IRIS ATM-OC3c 4Port XIO Board

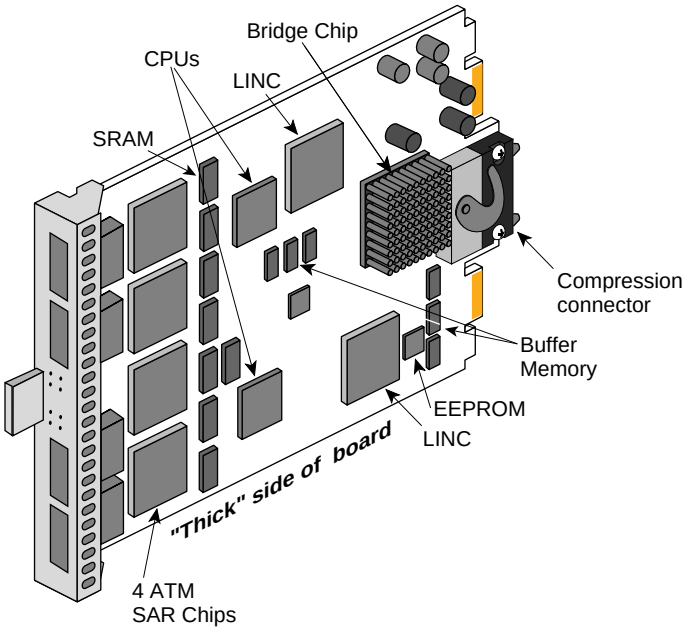


Figure 1-5 Components on IRIS ATM-OC3c XIO Board

1.2.2 Electrostatic Discharge

The IRIS ATM-OC3c XIO board is extremely 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 the IRIS ATM-OC3c 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 surface (for example, the antistatic bag in which the board is shipped or an antistatic mat).
- 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.

Follow these board-specific ESD preventive measures:

- Avoid touching the SRAM and CPU components on this board. They are highly sensitive to damage from ESD.
- Do not use an ohmmeter on this board.

1.2.3 Site Cabling

This section covers the description, the care, and the cleaning of external cables for the IRIS ATM-OC3c 4Port XIO board.

1.2.3.1 Cable Requirements

For each ATM port, the IRIS ATM-OC3c board provides one dual-SC receptacle on the board's I/O panel plate. To activate ATM functionality for a port, the port must be connected to an ATM switch, to an ATM-OC3c endpoint (host), or must have a loopback device installed.* This board uses long wavelength optics (1300 nm) and supports multimode cable of either 50 micron core or 62.5 micron core in lengths from 5 centimeters to 2000 meters, depending on the specific details of the installation. The site's connectors, splices, cabling, and installation of the cabling must conform to the physical layer specification for ATM over SONET-STS3c, as described in the *ATM User-Network Interface Specification*, version 3.0 or 3.1, section "Physical Layer for 155 Mbps Interface." Table 1-1 summarizes the optical specifications for the board. Figure 1-6 illustrates the data direction used in the board's dual-SC receptacle.

Table 1-1 Specifications for Optics on IRIS ATM-OC3c 4Port XIO Board

Item	Value[a]
Optical wavelength used by board components	1300 nm
Range for board's transmit power when ODL is coupled to 62.5/125 micron fiber	minimum = 19 dBm maximum = 14 dBm
Range of acceptable input power for board's receiver	minimum = 30 dBm maximum = 14 dBm

a. When these specifications are met, operation is usually possible with 2000 meter lengths of 62.5 micron multimode fiber providing dispersion bandwidth of at least 310 MHz-km.

* For direct attachment to an ATM host (no switch in between) or for loopback operation, the board must be configured to use its own clock as the clock source for transmission. See the *atmconfig* reference (man) page.

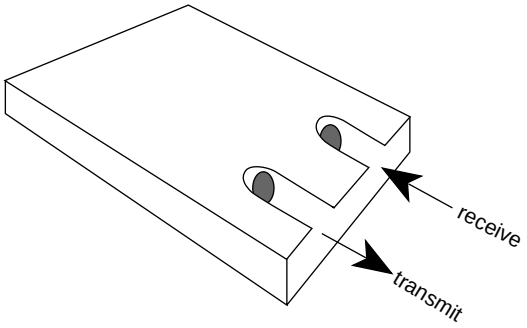


Figure 1-6 Data Direction Used in Dual-SC Receptacles on IRIS ATM-OC3c XIO Board

External fiber-optic cables, in various lengths, for the ports on the IRIS ATM-OC3c 4Port XIO board can be ordered directly from Silicon Graphics, using the part numbers listed below. These cable assemblies are terminated with dual-SC connectors on both ends. Have the customer contact their local sales representative. Alternatively, cables can be purchased from any reputable fiber-optic cable vendor.

Part Number	Assembly	Description
018-0656-001	X-F-OPT-3M	3-Meter Fiber Optic Cable Assembly
018-0656-101	X-F-OPT-10M	10-Meter Fiber Optic Cable Assembly
018-0656-201	X-F-OPT-25M	25-Meter Fiber Optic Cable Assembly
018-0656-301	X-F-OPT-100M	100-Meter Fiber Optic Cable Assembly
018-0656-401	X-F-OPT-300M	300-Meter Fiber Optic Cable Assembly

1.2.3.2 Cable Care and Cleaning

When handling or cleaning fiber-optic cables, follow these guidelines:

- Do not bend fiber-optic cable into any shape that involves a radius less than 4 inches. The material can fracture or break.
- Do not step on, strike, or drop anything onto fiber-optic cables. The material inside can fracture or break.

- Do not expose the cable ends to pollutants, such as dust, lint, grease, or liquids that leave residue (for example, rubbing alcohol). Performance of the fiber-optic cable degrades seriously due to pollutants.
  - Do not touch the fiber-optic material that is exposed at the ends of cables with fingers, paper tissues, cloth that can leave lint, or anything abrasive.
  - Do not leave cable ends or panel-plate receptacles uncapped or unattached.
  - Do not try to clean fiber-optic material except as described below.
  - Do not blow on the fiber-optic material with anything except dry, compressed inert gas.
- To clean a fiber-optic cable, gently rub the tip of the fiber-optic material at each end of the cable with a soft, lint-free cloth that has been moistened with reagent grade isopropyl alcohol (isopropanol 92%), then let the tip dry completely.

  Note: Do not use prepared cleaning compounds, such as tape-head cleaner or denatured (rubbing) alcohol.

  To dry the liquid from fiber-optic material, you can fan ambient air over the end of the cable or blow it with a can of dry, compressed inert gas (for example, 100% pure nitrogen).

  Note: Do not blow on the fibers with your mouth.

1.2.3.3 Cable Verification

If you suspect that a fiber-optic cable is faulty, you need special equipment (for example, an optical time domain reflectometer [OTDR]) to accurately measure whether the optical signal that passes through a section of optical fiber is strong enough and clear enough to be interpreted accurately by the receiver.

1.2.4 Maximum Number of IRIS ATM-OC3c 4Port XIO Boards

The maximum number of IRIS ATM-OC3c 4Port XIO boards that can be installed into the different chassis and systems is summarized in Table 1-2.

Table 1-2 Maximum Number of IRIS ATM-OC3c 4Port XIO Boards That Can Be Installed

Chassis Type	Boards per Chassis	Per Fabric of 2 or More Interconnected Chassis
Origin2000 Deskside:		interconnection is not supported
220 V	6 boards (24 ports)	
110 V	3 boards (12 ports)	
Onyx2 Deskside	3 boards (12 ports)	interconnection is not supported
Origin2000 Rackmount	6 boards (24 ports)	6 boards (24 ports)
Onyx2 Rackmount	6 boards (24 ports)	6 board (24 ports)

Note: A “fabric” is two or more modules that are interconnected with CrayLink Interconnect cables.

1.2.5 Power Requirements

Table 1-3 Power Requirements for IRIS ATM-OC3c 4Port XIO Board

Average	39.4 watts of power
Maximum	5 volts at 4.9 amps, 3.5 volts at 5.3 amps

1.2.6 Panel Plate and LED Behavior

The panel plate has four labeled ATM ports, as illustrated in Figure 1-7. Sticky labels can be placed on the panel to indicate the IP-over-ATM network interfaces that have been assigned to each port.

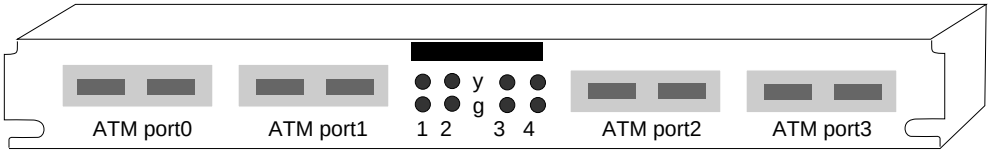


Figure 1-7 Panel Plate and LEDs for IRIS ATM-OC3c 4Port XIO Board

The LEDs are labeled by numerals under and letters in the middle of the LEDs: **y** (yellow), **g** (green), **1**, **2**, **3**, and **4**. The behavior of the LEDs is controlled by firmware in the R4640 processors. There are 3 conditions that generate LED behavior:

- Normal operation after power-on: The yellow (error code) LEDs are all off and the green ones are steadily on indicating that no loss-of-signal is occurring. The behavior of each LED during normal operation is described in Table 1-4. Figure 1-8 illustrates normal LED behavior.
- Errors after power-on: Any yellow LED is on or blinking or a green LED is off. Table 1-5 describes the LED behavior during error operation. In this condition, the LEDs work in pairs (one green and one yellow) to communicate information about a single port:
  y1 and **g1** report for ATM Port 0
  y2 and **g2** report for ATM Port 1
  y3 and **g3** report for ATM Port 2
  y4 and **g4** report for ATM Port 3
- Power-on or reset: During power-on or reset, the LEDs work in groups of four: **y1**, **y2**, **g1** and **g2** display codes from CPU_1 (which controls board logic for ports 0 and 1), while **y3**, **y4**, **g3**, and **g4** display codes from the CPU_2 (which controls ports 2 and 3). Table 1-6 and Table 1-7 describe the LED behavior during power-on or reset.

  Note: Table 1-6 and Table 1-7 describe the same information. The only difference is the orientation of the panel plate, which depends on the board's installation.

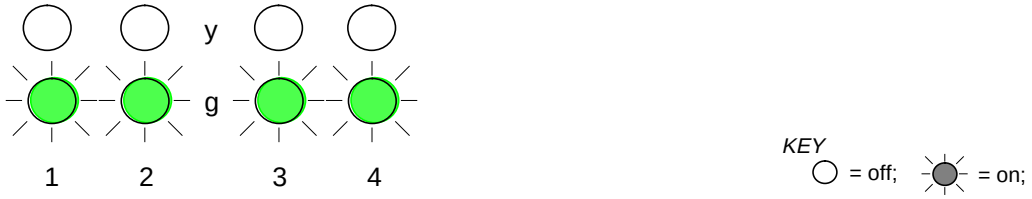


Figure 1-8 LED Behavior During Normal Operation

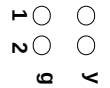
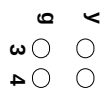
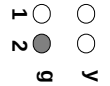
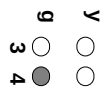
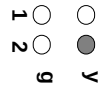
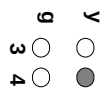
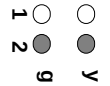
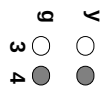
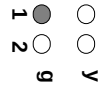
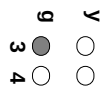
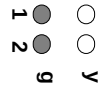
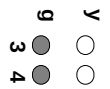
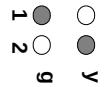
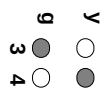
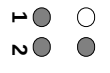
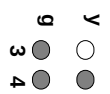
Table 1-4 Normal Operation LED Behavior for IRIS ATM-OC3c 4Port XIO Board

LED	Normal Behavior	Description
Green	ON	Signal Detect: When a green LED is on, the port associated with that LED is functional and is receiving correct section-level framing (that is, no loss-of-signal) on its incoming fiber or, when the board is operating in internal loopback, from the source. LED **g1** reports **port0** LED **g2** reports **port1** LED **g3** reports **port2** LED **g4** reports **port3**
Yellow	OFF	Error: These LEDs turn on only when there is a problem with the IRIS ATM-OC3c XIO board. See Table 1-5. LED **y1** reports **port0** LED **y2** reports **port1** LED **y3** reports **port2** LED **y4** reports **port3**

Table 1-5 After Power-On Error LED Behavior for IRIS ATM-OC3c 4Port XIO Board

Port's Green LED	Port's Yellow LED	Description
off	off	The problem is probably one of the following: the port is in the PRE-INIT or DOWN state (use *atmconfig* to bring it to the UP state), the connection at the I/O panel plate or at the other end of the cable link is loose or broken, the fiber-optic cable tip is dirty, the cable's core is shattered or broken, or the system at the other end of the port's cable is dysfunctional.
off	on	Indicates a SONET alarm has been received on the incoming fiber for this port.
on	on	Indicates dysfunctional board logic or components for the associated port.

Table 1-6 Power-on (Boot Code) LED Behavior: Green LEDs on Left

Pattern for CPU_1	Description	Pattern for CPU_2
	All off. LINC chip is being reset, which turns the LEDs off.	
	The power-on code has entered the reset vector and is initializing the LINC.	
	Power-on code is configuring the Buffer Memory (SDRAM).	
	Power-on code is initializing the cache memory.	
	Power-on code is testing the Buffer Memory (SDRAM).	
	Power-on code is testing the SSRAM.	
	Power-on code has completed all memory tests.	
	Error: the power-on code did not find any operational firmware to run. It is spin-looping, waiting for a communication from the host operating system.	

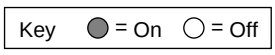
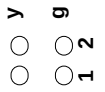
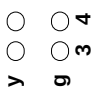
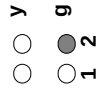
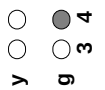
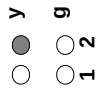
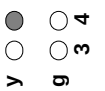
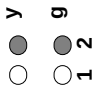
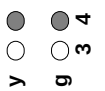
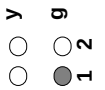
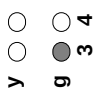
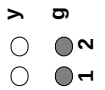
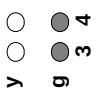
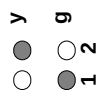
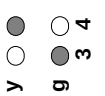
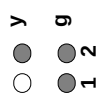
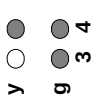


Table 1-7 Power-on (Boot Code) LED Behavior: Yellow LEDs on Left

Pattern for CPU_1	Description	Pattern for CPU_2
	All OFF. LINC chip is being reset which turns the LEDs off.	
	The power-on code has entered the reset vector and is initializing the LINC.	
	Power-on code is configuring the Buffer Memory (SDRAM).	
	Power-on code is initializing the cache memory.	
	Power-on code is testing the Buffer Memory (SDRAM).	
	Power-on code is testing the SSRAM.	
	Power-on code has completed all memory tests.	
	Error: the power-on code did not find any operational firmware to run. It is spin-looping, waiting for a communication from the host operating system.	

Key ● = On ○ = Off

Chapter 2

Installation Instructions for Origin2000 Deskside Chassis

This chapter describes the steps for installing an IRIS ATM-OC3c 4Port XIO board into an Origin2000 Deskside chassis.

2.1 Verify All Parts Are Available

Before starting the installation, open the IRIS ATM-OC3c 4Port XIO Board box and verify that all the components are included. Table 2-1 lists the components.

Table 2-1 Component List for IRIS ATM-OC3c XIO Board for Origin2000 Deskside

Item	Quantity
IRIS ATM-OC3c XIO Board in antistatic bag	1
IRIS ATM software on CD-ROM	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.

   Caution: The IRIS ATM-OC3c XIO board has components that are very sensitive to static electricity. This caution is real; it is not just a standard precaution.
3. Know how to safely handle fiber-optic cable, as described in "Cable Care and Cleaning" in Chapter 1.

2.3 Install and Configure IRIS ATM Software

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

1. Verify that the IRIS ATM software is installed:

   ```
   % versions atm
   I   atm   05/31/96   ATM Software, version
   ```

   If the IRIS ATM software is not installed or if the displayed *version* is earlier than 2.2, install it from the CD (or other source).

2. Follow the instructions in Chapter 2 of the *IRIS ATM Configuration Guide* to configure (a) the IRIS ATM software (driver and daemons), and optionally, (b) the IP network interfaces for IRIS ATM (*atm#*).

   Note: To configure the ATM driver and daemons, you need to understand how IRIS ATM ports are assigned numbers during bootup. See the reference page for *ioconfig*. If you are unsure about the number assignment, you can install the hardware first, power on the system, use *hinv* to display the assigned numbers, then do the configuration.

   To configure IP-over-ATM network interfaces (*atm0*, *atm1*, and so on), you need to understand how the numbered interfaces are assigned during bootup. See the reference page for *ioconfig* or the section entitled "How ATM Ports Are Assigned to Interfaces" in the *IRIS ATM Configuration Guide* (that is shipped as an online document with the IRIS ATM product).

2.4 Make System Safe

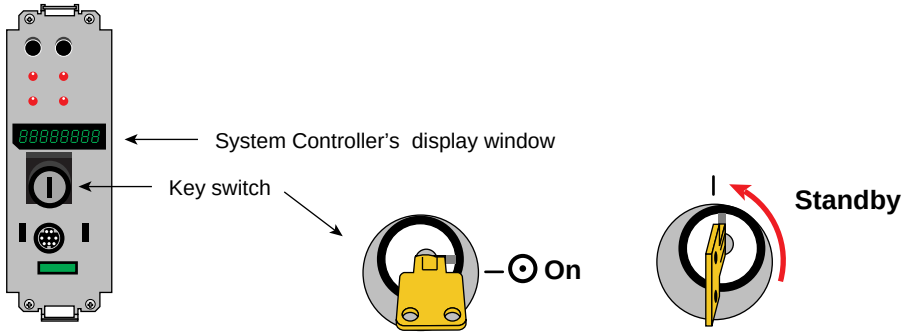
Before starting the installation, follow the instructions in this section to make the system and its surroundings physically safe for you.

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

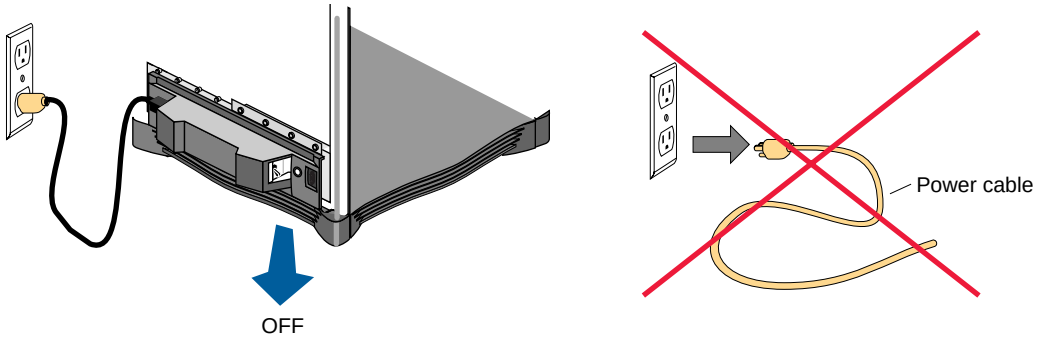
1. Shutdown the software:

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

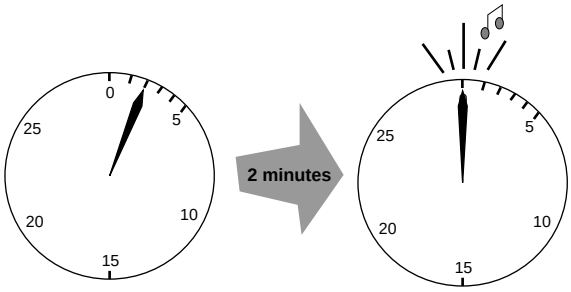
2. When the message appears indicating that it is safe to power off the system, turn the key switch on the System Controller to the STANDBY position.



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



4. 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 and prepare an appropriate XIO slot 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 1-2 in Chapter 1 of the *Origin2000 Deskside Owner's Guide* and the *Origin2000 and Onyx2 Deskside and Rackmount Installation Instructions* provides information that can help you determine which of the slots are activated and which can be used.

   Note: In general, if an Origin2000 Deskside chassis 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*, all 12 XIO slots are available.

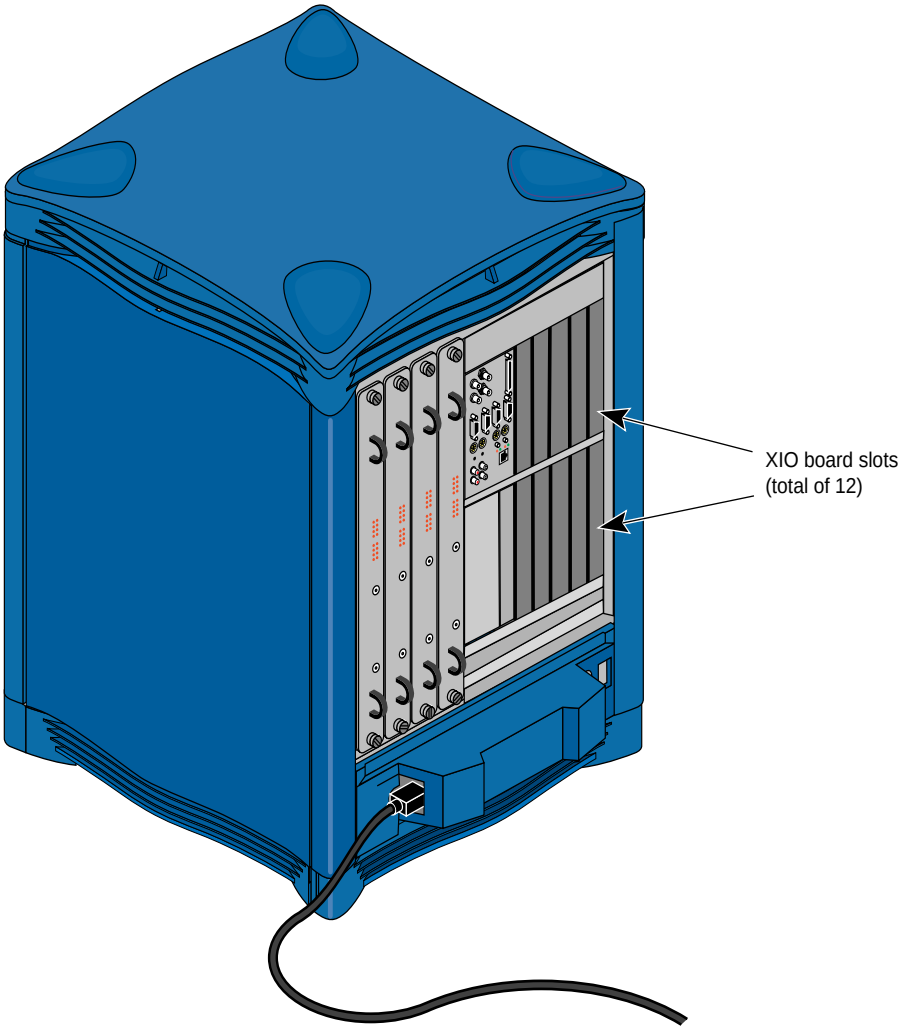


Figure 2-1 Rear of Origin2000 Deskside Chassis

2. Select a slot for the IRIS ATM-OC3c XIO board.

   The IRIS ATM-OC3c 4Port XIO board can be installed into any of the XIO slots (illustrated in Figure 2-2), including slots 1 and 2 that are designed to accommodate the BaseIO and Internal PCI Adapter options.

   In selecting a slot for the IRIS ATM-OC3c 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.

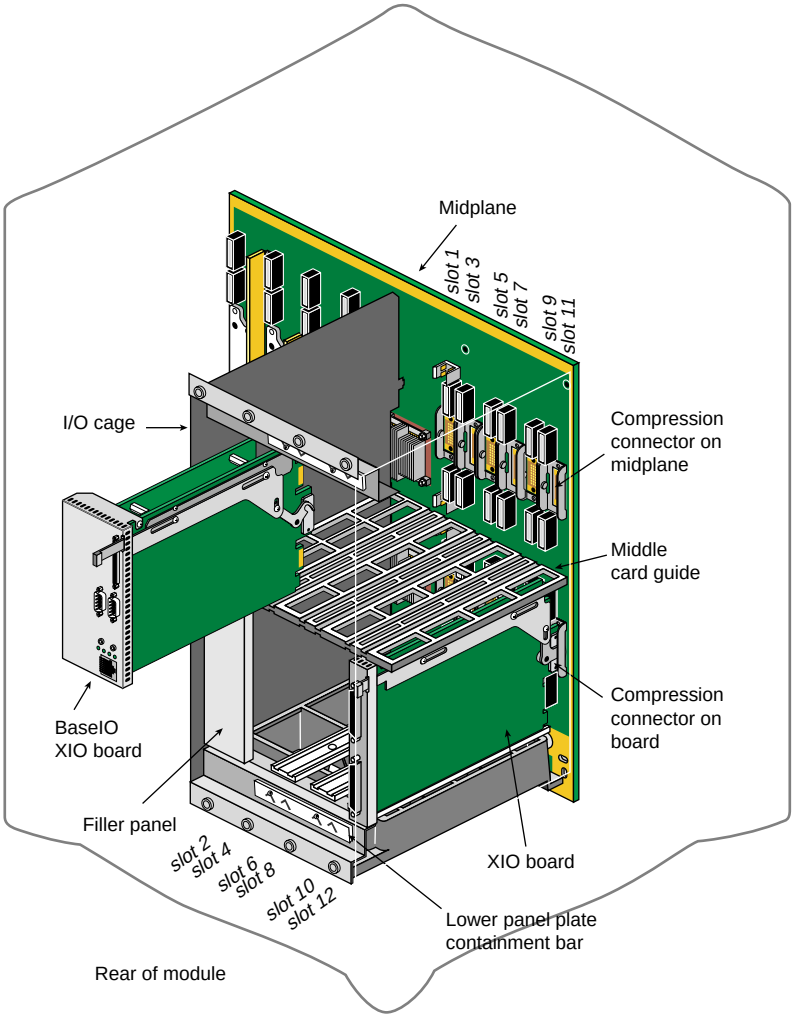


Figure 2-2 I/O Items in the Origin2000 Deskside Chassis

3. Ground yourself.

   Caution: Failure to ground yourself may result in irreparable damage to or malfunction of the IRIS ATM-OC3c XIO 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 diagonally away (up or down) from the panel plates. You must slide the bar over some rivets. The bar snaps 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 IRIS ATM-OC3c 4Port XIO Board."

2.6 Install IRIS ATM-OC3c 4Port XIO Board

This section describes how to install the IRIS ATM-OC3c board into its XIO slot. You should still be grounded.

Caution: Exposure to electrostatic discharge may irreparably damage the IRIS ATM-OC3c XIO board.

1. Remove the board from its antistatic 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 2-3. Save this cap. You will need it to cover the compression connector if you remove the board for any reason.

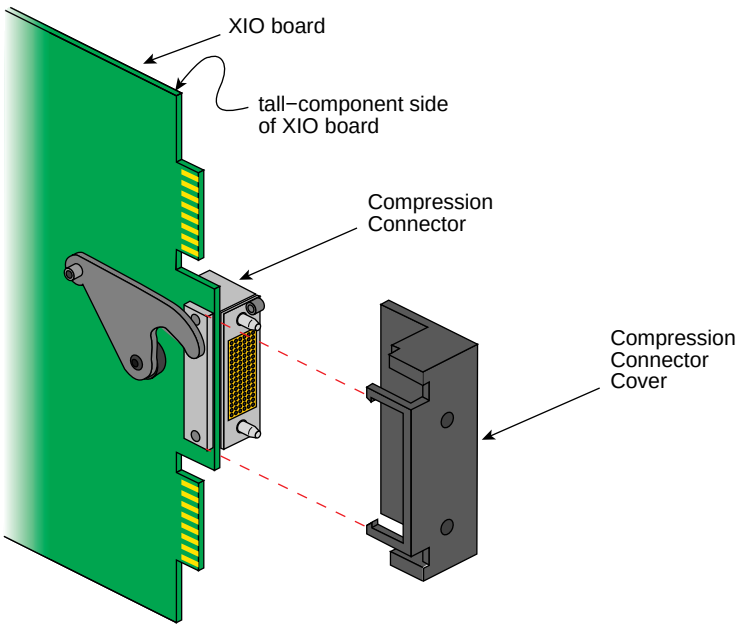


Figure 2-3 Removing the Protective Cap From the Compression Connector

3. Identify the tall-component side of the IRIS ATM-OC3c XIO board. The tall-component side has the compression connector and the dual-SC receptacles.
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:
   port 3 (on the panel plate) is at the top and the tall-component side of the board is to your left, as illustrated in Figure 2-4.

   For slots 3, 4, 7, 8, 11, and 12:
   port 0 (on the panel plate) is at the top and the tall-component side of the board is to your right, as illustrated in Figure 2-4.

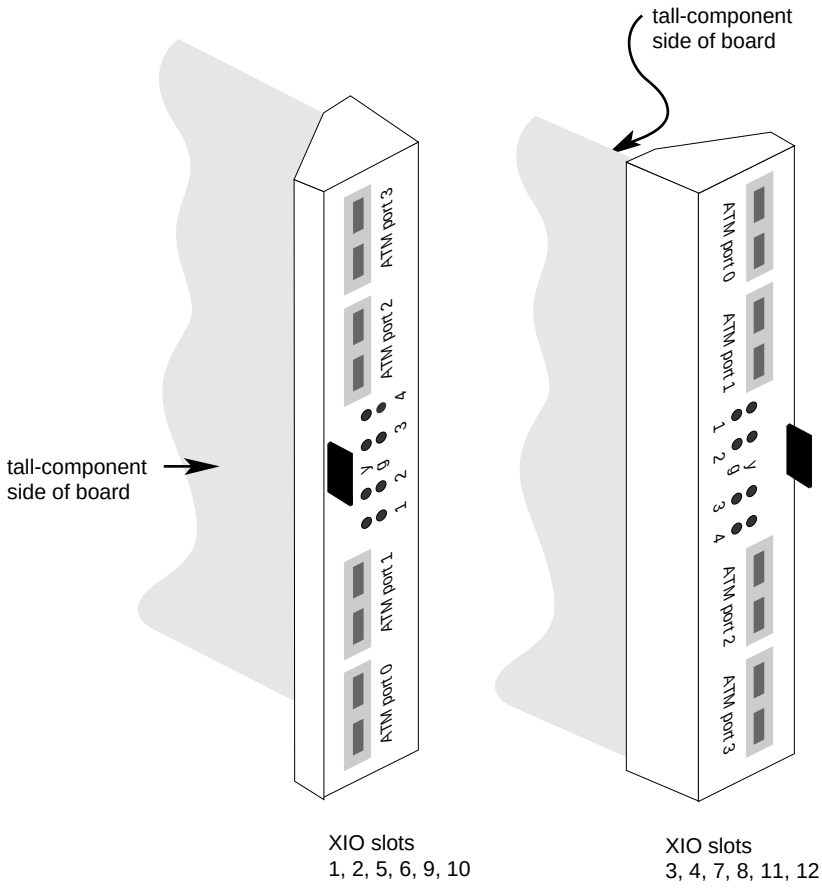


Figure 2-4 Proper Orientation for XIO Boards in Origin2000 Deskside Slots

5. Pull the actuator handle to open the compression connector hooks.
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.
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 ATM Cables."

2.7 Attach ATM Cables

This section describes the attachment of external ATM cables.

1. For each IRIS ATM port, locate the site's ATM/SONET fiber-optic cable for the connection.

   Note: This external cable is supplied by the customer. External cables and all cabling for the site's ATM switch fabric must conform to the ATM-OC3c specification. See "Site Cabling" in Chapter 1 for complete details.

2. Optional: Put labels on the panel plate and cables.
3. Remove the protective cap from the cable's connector.

   Note: Do not touch the fiber-optic material.

4. Clean and dry the tip of each fiber within the cable's connector, following the instructions in "Cable Care and Cleaning" in Chapter 1, by gently rubbing the tip with a soft, lint-free cloth that has been moistened with reagent grade isopropyl alcohol. If you do not have the proper equipment, skip this step.

   Note: Do not use prepared cleaning compounds, such as tape-head cleaner or denatured (rubbing) alcohol.

5. Remove (pull out) the protective plugs from the board's receptacle.
6. Attach the external ATM cable to the IRIS ATM port.

   Orient the cable's connector with the dual-SC receptacle on the board's panel plate. The receptacle is keyed to ensure proper orientation. Insert the connector until the two parts snap together.

7. Proceed to "Finish."

2.8 Finish

When the board is installed and connected, follow these instructions to start operation:

1. Flip the power switch ON.
2. Restart the system by turning the key on the System Controller to ON.
3. Log in.
4. If you have not installed and configured the IRIS ATM software, do so now by following the instructions in the *IRIS ATM Configuration Guide*. The IRIS ATM connection cannot function until the software has been configured.

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

5. Verify that the board's LEDs indicate normal operation, as illustrated by Figure 1-8.
6. Verify that the board has been located by the operating system during the bootup, with either of the following commands:

   ```
   % hinv -mvv | grep ATM
   QUAD_ATM Board:   barcode ######    part 030-0948-00# rev #
   ATM XIO 4 port OC-3c: module #, slot io#, unit # (ports: #-#)
   ```

   ```
   % find /hw/module -name atm
   /hw/module/#/slot/io#/quad_atm/pci/0/atm
   ```

   where the # after module and slot should correctly identify the chassis and XIO slot into which you installed the board.

7. Verify that the board is operational by following the verification tests described in Chapter 2 of the *IRIS ATM Configuration Guide*.

Chapter 3

Installation Instructions for Onyx2 Deskside Chassis

This chapter describes the steps for installing an IRIS ATM-OC3c 4Port XIO board into an Onyx2 Deskside chassis.

3.1 Verify All Parts Are Available

Before starting the installation, open the IRIS ATM-OC3c 4Port XIO Board box and verify that all the components are included. Table 3-1 lists the components.

Table 3-1 Component List for IRIS ATM-OC3c XIO Board for Onyx2 Deskside

Item	Quantity
IRIS ATM-OC3c 4Port XIO Board in antistatic bag	1
IRIS ATM software on CD-ROM	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.

   Caution: The IRIS ATM-OC3c 4Port XIO board has components that are very sensitive to static electricity. This caution is real; it is not just a standard precaution.
3. Know how to safely handle fiber-optic cable, as described in "Cable Care and Cleaning" in Chapter 1.

3.3 Install and Configure IRIS ATM Software

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

1. Verify that the IRIS ATM software is installed:

   ```
   % versions atm
   I   atm   05/31/96   ATM Software, version
   ```

   If the IRIS ATM software is not installed or if the displayed *version* is earlier than 2.2, install it from the CD (or other source).

2. Follow the instructions in Chapter 2 of the *IRIS ATM Configuration Guide* to configure (a) the IRIS ATM software (driver and daemons), and optionally, (b) the IP network interfaces for IRIS ATM (*atm#*).

   Note: To configure the ATM driver and daemons, you need to understand how IRIS ATM ports are assigned numbers during bootup. See the reference page for *ioconfig*. If you are unsure about the number assignment, you can install the hardware first, power on the system, use *hinv* to display the assigned numbers, then do the configuration.

   To configure IP-over-ATM network interfaces (*atm0*, *atm1*, and so on), you need to understand how the numbered interfaces are assigned during bootup. See the reference page for *ioconfig* or the section entitled "How ATM Ports Are Assigned to Interfaces" in the *IRIS ATM Configuration Guide* (that is shipped as an online document with the IRIS ATM product).

3.4 Make System Safe

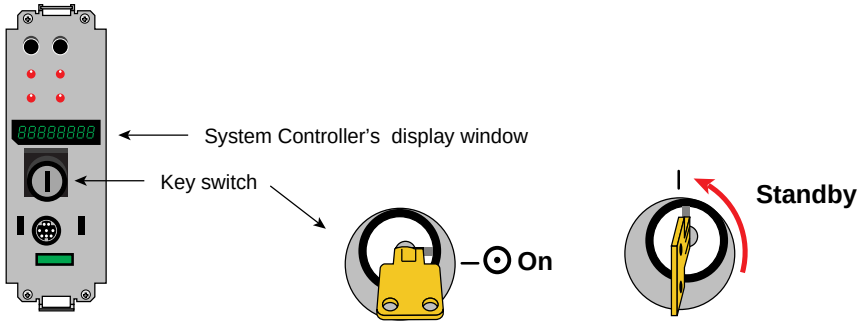
Before starting the installation, follow the instructions in this section to make the system and its surroundings physically safe for you.

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

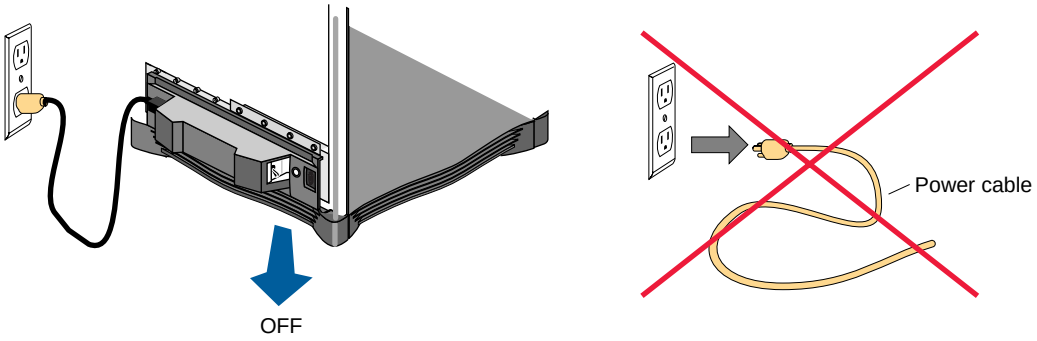
1. Shutdown the software:

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

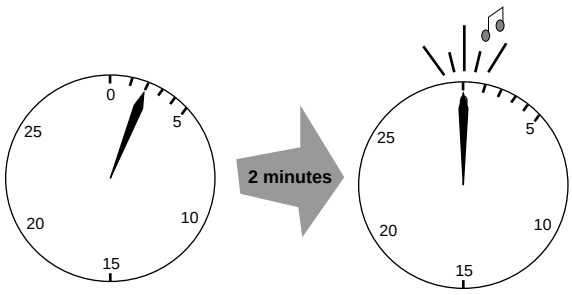
2. When the message appears indicating that it is safe to power off the system, turn the key switch on the System Controller to the STANDBY position.



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



4. 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 and prepare an appropriate XIO slot for the installation.

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

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

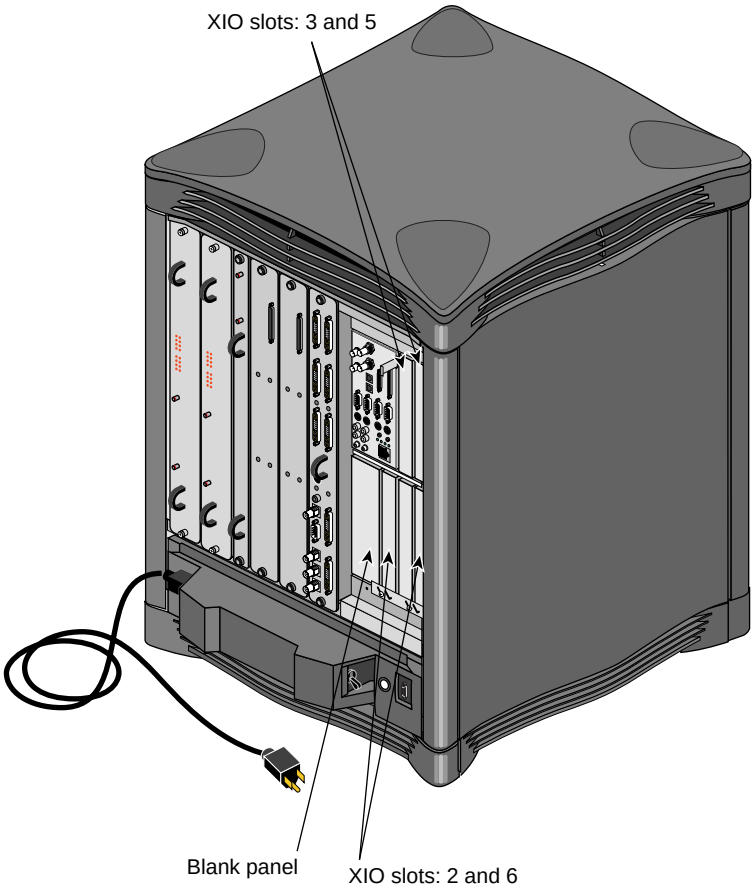


Figure 3-1 Rear of Onyx2 Deskside Chassis

2. Select a slot for the IRIS ATM-OC3c XIO board.

   The IRIS ATM-OC3c 4Port XIO board can be installed into XIO slot 2, 3, 5, or 6 (illustrated in Figure 3-2). Slot 2 can accommodate either the IRIS ATM-OC3c board or the Internal PCI Adapter (box) option.

   Note: Slot 4 cannot be used for the IRIS ATM-OC3c 4Port 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.

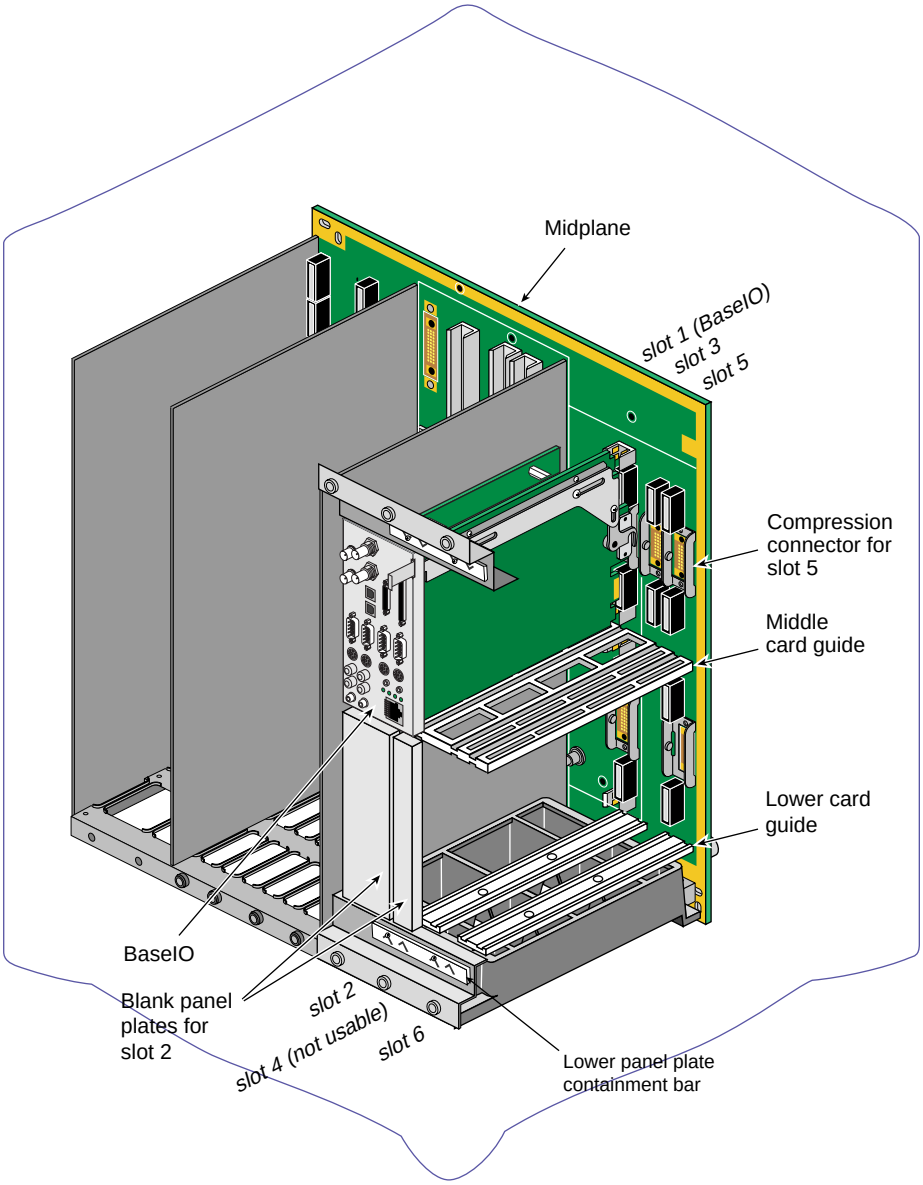


Figure 3-2 XIO Items in Onyx2 Deskside Chassis

3. Ground yourself.

   Caution: Failure to ground yourself may result in irreparable damage to or malfunction of the IRIS ATM-OC3c 4Port 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 diagonally away (up or down) from the panel plates. You must slide the bar over some rivets. The bar snaps 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 IRIS ATM-OC3c 4Port XIO Board.”

3.6 Install IRIS ATM-OC3c 4Port XIO Board

This section describes how to install the IRIS ATM-OC3c 4Port board into its XIO slot. You should still be grounded.

Caution: Exposure to electrostatic discharge may irreparably damage the IRIS ATM-OC3c XIO board.

1. Remove the board from its antistatic 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.

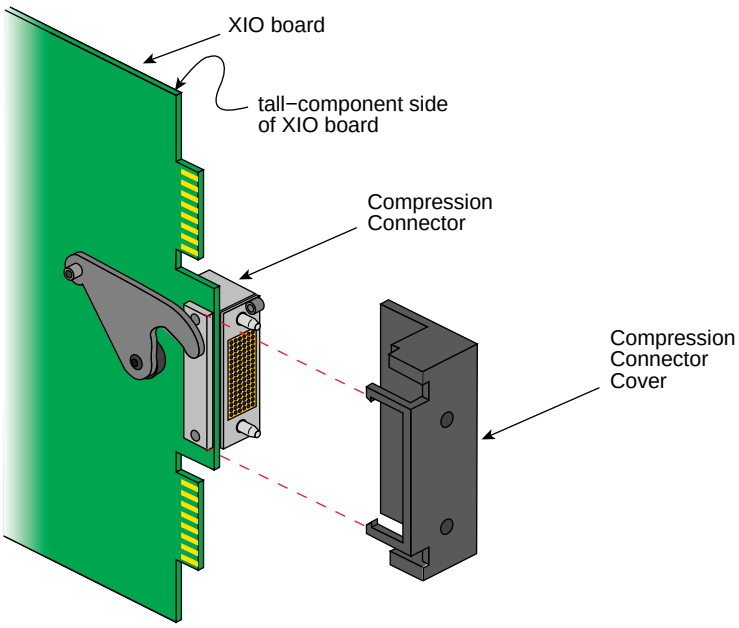


Figure 3-3 Removing the Protective Cap From the Compression Connector

3. Identify the tall-component side of the IRIS ATM-OC3c XIO board. The tall-component side has the compression connector and the dual-SC 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:
port 3 (on the panel plate) is at the top and the tall-component side is to your left.

For slot 3:
port 0 (on the panel plate) is at the top and the tall-component side is to your right.

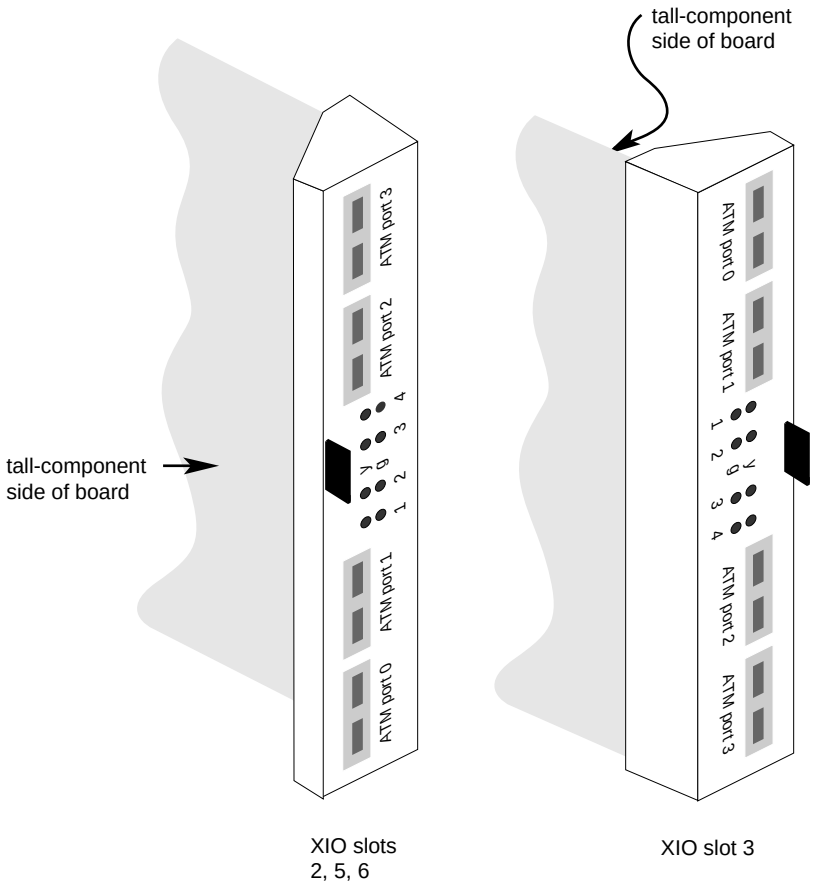


Figure 3-4 Proper Orientation for XIO Boards in Onyx2 Deskside Slots

5. Pull the actuator handle to open the compression connector hooks.
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.
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 ATM Cables."

3.7 Attach ATM Cables

This section describes the attachment of external ATM cables.

1. For each port, locate the site's fiber-optic cable for this ATM connection.

   Note: This external cable is supplied by the customer. External cables and all cabling for the site's ATM switch fabric must conform to the ATM specification. See "Site Cabling" in Chapter 1 for complete details.

2. Optional: Put labels on the panel plate and cables.
3. Remove the protective cap from the cable's connector.

   Note: Do not touch the fiber-optic material.

4. Clean and dry the tip of each fiber within the cable's connector, following the instructions in "Cable Care and Cleaning" in Chapter 1, by gently rubbing the tip with a soft, lint-free cloth that has been moistened with reagent grade isopropyl alcohol. If you do not have the proper equipment, skip this step.

   Note: Do not use prepared cleaning compounds, such as tape-head cleaner or denatured (rubbing) alcohol.

5. Remove (pull out) the protective plugs from the board's receptacle.
6. Attach the external ATM cable to the IRIS ATM port.

   Orient the cable's connector with the dual-SC receptacle on the board's panel plate. The receptacle is keyed to ensure proper orientation. Insert the connector until the two parts snap together.

7. Proceed to "Finish."

3.8 Finish

When the board is installed and connected, follow these instructions to start operation:

1. Flip the power switch ON.
2. Restart the system by turning the key in the System Controller to ON.
3. Log in.
4. If you have not installed and configured the IRIS ATM software, do so now by following the instructions in the *IRIS ATM Configuration Guide*. The IRIS ATM connection cannot function until the software has been configured.

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

5. Verify that the board's LEDs indicate normal operation, as illustrated by Figure 1-8.
6. Verify that the board has been located by the operating system during the bootup, with either of the following commands:

   ```
   % hinv -mvv | grep ATM
   QUAD_ATM Board:  barcode ######   part 030-0948-00# rev #
   ATM XIO 4 port OC-3c: module #, slot io#, unit # (ports: #-#)
   ```

   ```
   % find /hw/module -name atm
   /hw/module/#/slot/io#/quad_atm/pci/0/atm
   ```

   where the # after module and slot should correctly identify the chassis and XIO slot into which you installed the board.

7. Verify that the board is operational by following the verification tests described in Chapter 2 of the *IRIS ATM Configuration Guide*.

Chapter 4

Installation Instructions for Origin2000 and Onyx2 Rackmount Chassis

This chapter describes the steps for installing an IRIS ATM-OC3c 4Port XIO board into an Origin2000 or Onyx2 Rackmount chassis.

4.1 Verify All Parts Are Available

Before starting the installation, open the IRIS ATM-OC3c 4Port XIO Board box and verify that all the components are included. Table 4-1 lists the components.

Table 4-1 Component List for IRIS ATM-OC3c XIO Board for Origin2000 or Onyx2 Rackmount

Item	Quantity
IRIS ATM-OC3c 4Port XIO Board in antistatic bag	1
IRIS ATM software on CD-ROM	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.

   Caution: The IRIS ATM-OC3c XIO board has components that are very sensitive to static electricity. This caution is real; it is not just a standard precaution.
3. Know how to safely handle fiber-optic cable, as described in "Cable Care and Cleaning" in Chapter 1.

4.3 Install and Configure IRIS ATM Software

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

1. Verify that the IRIS ATM software is installed:

   ```
   % versions atm
   I   atm   05/31/96   ATM Software, version
   ```

   If the IRIS ATM software is not installed or if the displayed *version* is earlier than 2.2, install it from the CD (or other source).

2. Follow the instructions in Chapter 2 of the *IRIS ATM Configuration Guide* to configure (a) the IRIS ATM software (driver and daemons), and optionally, (b) the IP network interface for IRIS ATM (*atm#*).

   Note: To configure the ATM driver and daemons, you need to understand how IRIS ATM ports are assigned numbers during bootup. See the reference page for *ioconfig*. If you are unsure about the number assignment, you can install the hardware first, power on the system, use *hinv* to display the assigned numbers, then do the configuration.

   To configure IP-over-ATM network interfaces (*atm0*, *atm1*, and so on), you need to understand how the numbered interfaces are assigned during bootup. See the reference page for *ioconfig* or the section entitled "How ATM Ports Are Assigned to Interfaces" in the *IRIS ATM Configuration Guide* (an online document included with the IRIS ATM software).

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 IRIS ATM-OC3c 4Port XIO Board

Description of Rule	Restriction
XIO slots that are physically compatible for installation of an IRIS ATM-OC3c XIO board	All slots (that is, slots 1-12 in each module[a])
Absolute maximum number of IRIS ATM-OC3c XIO boards in one interconnected system of shared memory	16
Absolute maximum number of IRIS ATM-OC3c XIO boards in one Origin2000 Rackmount chassis	12
Absolute maximum number of IRIS ATM-OC3c XIO boards in one Onyx2 Rackmount chassis	6

Table 4-2 (continued) Rackmount Slot Selection Rules for the IRIS ATM-OC3c 4Port XIO Board

Description of Rule	Restriction
Absolute maximum number of IRIS ATM-OC3c XIO boards in one module of a rackmounted system	6
Recommended maximum number of IRIS ATM-OC3c XIO boards in slots 1-6 or in slots 7-12	3

a. Each Origin2000 Rackmount system contains two modules (one upper and one lower) both of which provide XIO slots. Each Onyx2 Rackmount system has one module 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 module (that is, the upper or the lower) you are going to work on.

   Note: In an Onyx2 Rackmount chassis, the graphics module cannot accommodate any XIO boards; only the processor module has XIO slots.

3. Determine which XIO slots in the selected chassis are usable. Figure 4-1 illustrates the XIO slots in a processor module.

   Depending on the number of Node boards, the number 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* provides information that can help you determine which of the slots are activated and which can be used.

   Note: In general, if a processor 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 the module 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 IRIS ATM-OC3c XIO board.

   The IRIS ATM-OC3c XIO board can be installed into any of the XIO slots (illustrated in Figure 4-1), including slots 1 and 2 that are designed to accommodate the BaseIO and Internal PCI Adapter options.

   In selecting a slot for the IRIS ATM-OC3c 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.

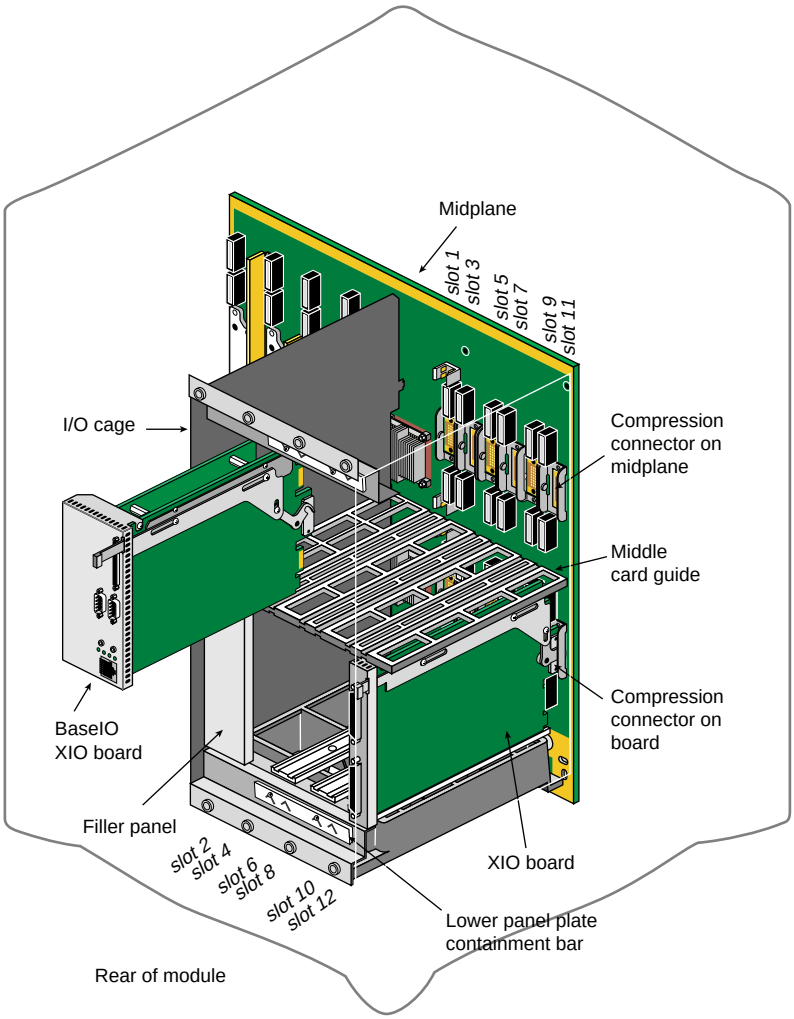


Figure 4-1 I/O Items in One Processor Module of an Origin2000 or Onyx2 Rackmount Chassis

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.**

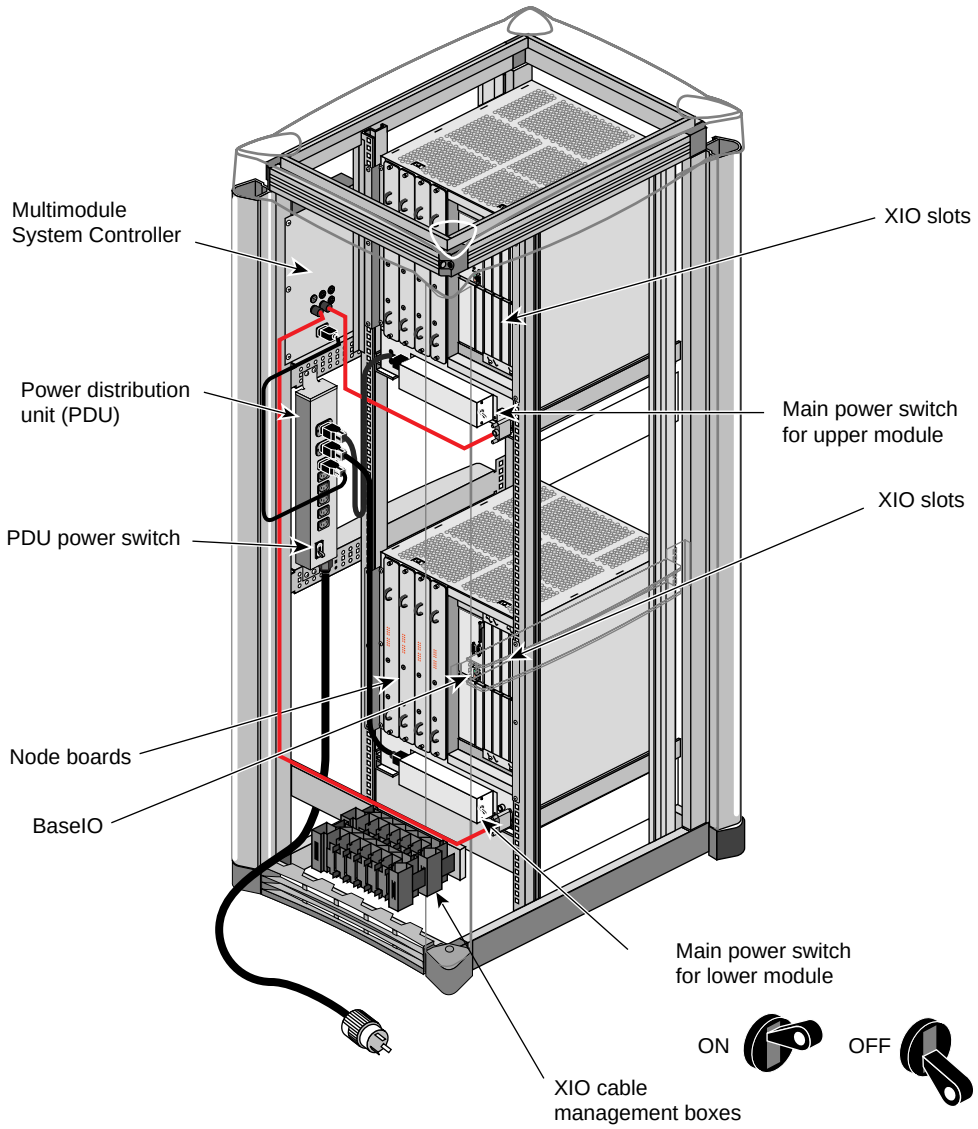


Figure 4-2 Rear of an Origin2000 Rackmount Chassis

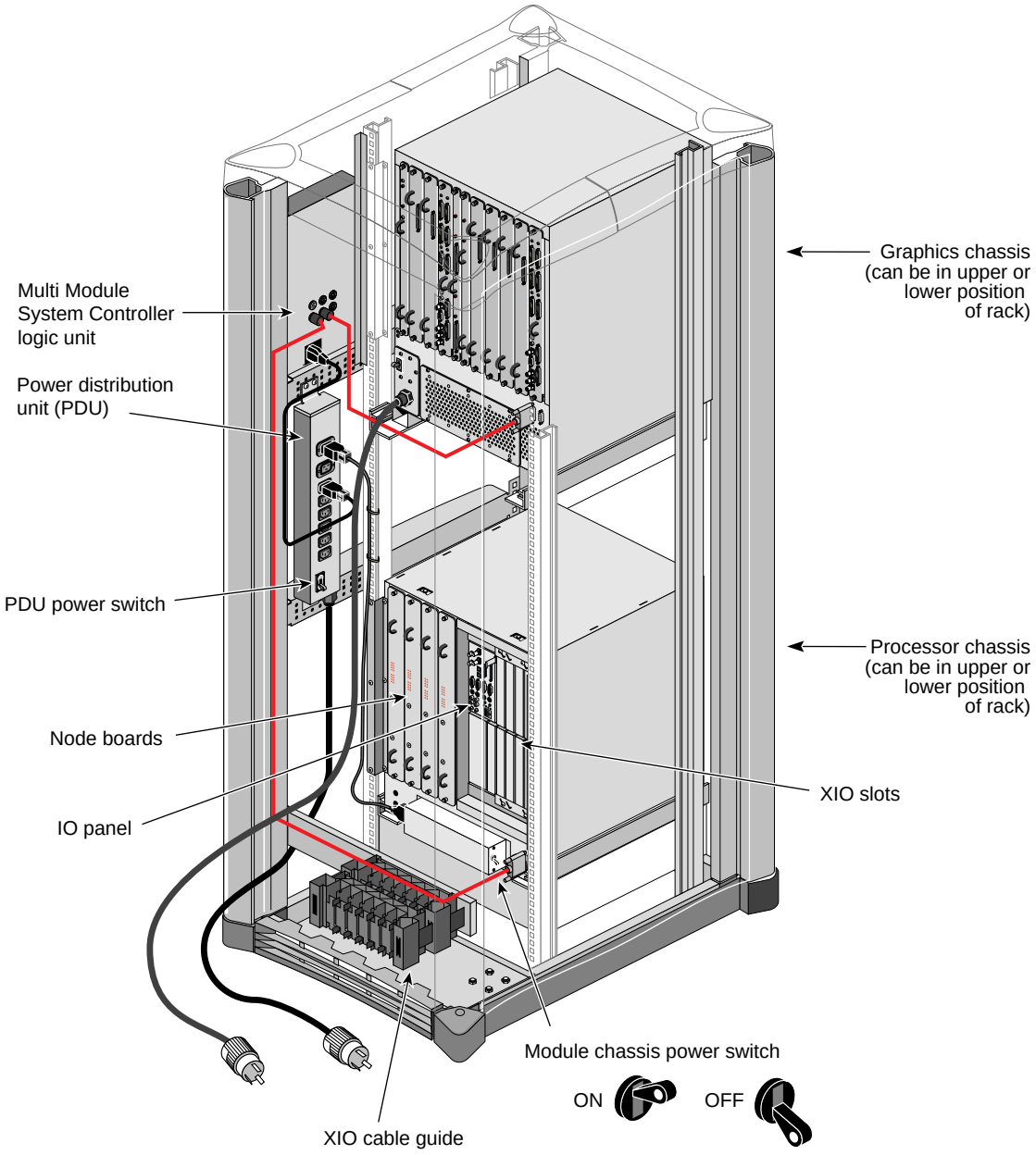


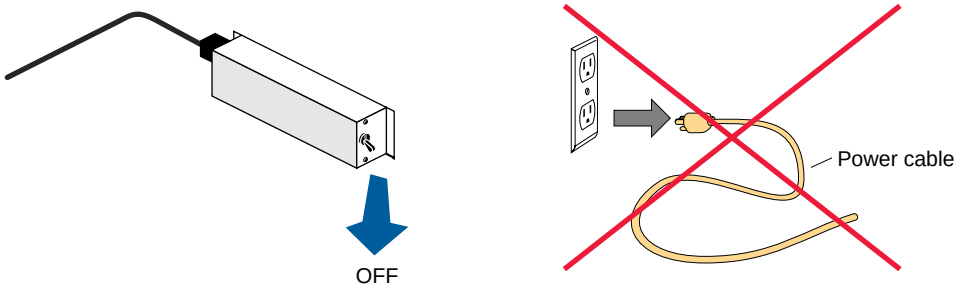
Figure 4-3 Rear of an Onyx2 Rackmount Chassis

1. Shutdown the software for the system:

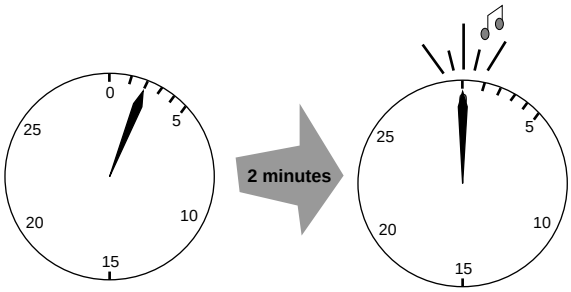
```
% su
Password: the_password
# /etc/halt
```

2. 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 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). Do not disconnect the power plug.



3. 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.**

4. 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.
5. Use 4-6 turns to loosen each of the bar's screws.
6. Pop the bar outwards (pull towards you), then slide it diagonally away (up or down) from the panel plates. You must slide the bar over some rivets. The bar snaps into a holding position so that it stays out of the way.
7. 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.
8. Proceed to the next section, "Install IRIS ATM-OC3c 4Port XIO Board."

4.6 Install IRIS ATM-OC3c 4Port XIO Board

This section describes how to install the IRIS ATM-OC3c board into its XIO slot.

1. Ground yourself.

   Caution: Failure to ground yourself may result in irreparable damage to or malfunction of the IRIS ATM-OC3c XIO board.

2. Remove the board from its antistatic bag and place it on your antistatic work surface.
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.

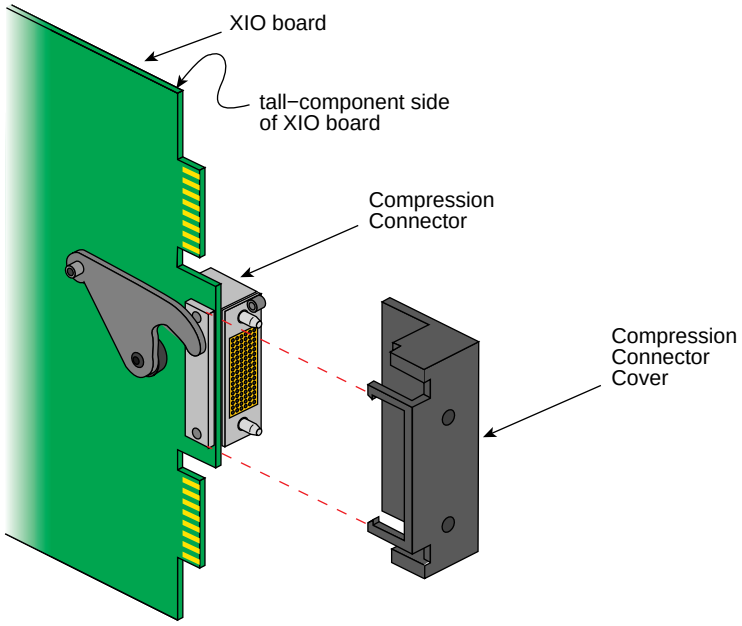


Figure 4-4 Removing the Protective Cap From the Compression Connector

4. Identify the tall-component side of the IRIS ATM-OC3c XIO board. The tall-component side has the compression connector and the dual-SC 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:
   port 3 (on the panel plate) is at the top and the tall-component side of the board is to your left, as illustrated in Figure 4-5.

   For slots 3, 4, 7, 8, 11, and 12:
   port 0 (on the panel plate) is at the top and the tall-component side of the board is to your right, as illustrated in Figure 4-5.

6. Pull the actuator handle to open the compression connector hooks.

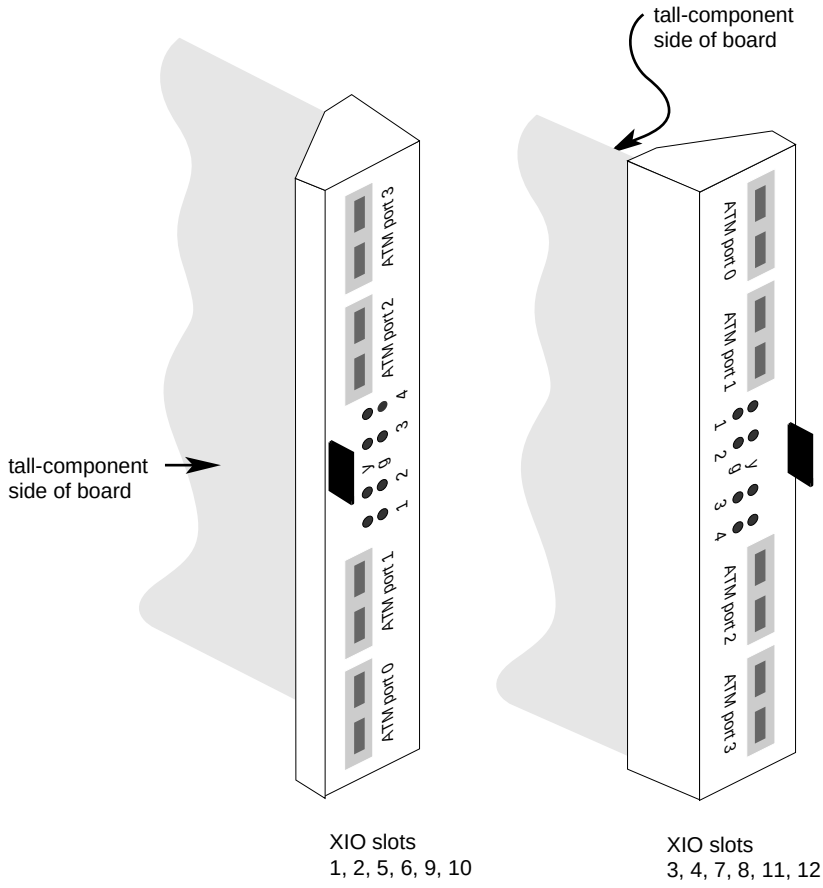


Figure 4-5 Proper Orientation for XIO Boards in Slots

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 ATM Cables."

4.7 Attach ATM Cables

This section describes the attachment and placement of external ATM 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.

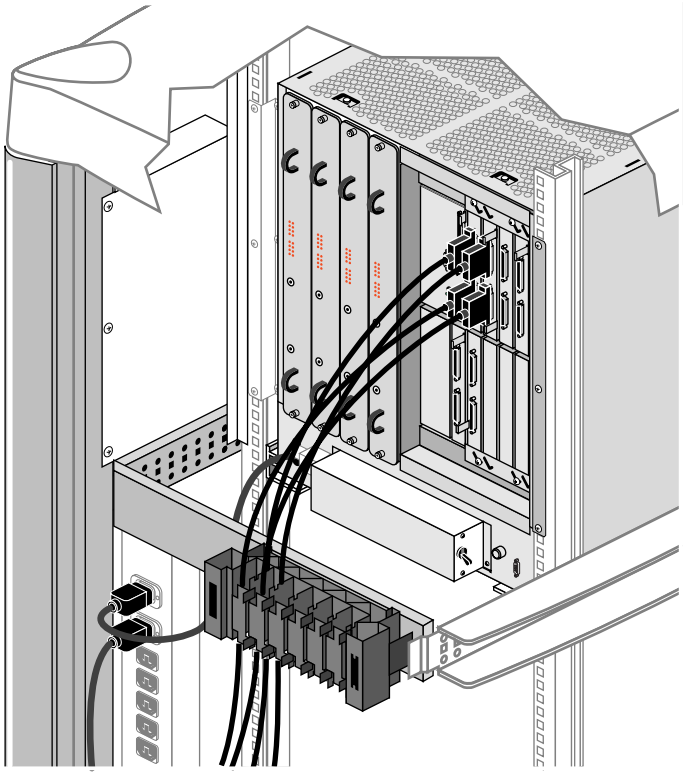


Figure 4-6 XIO Cable Management Box

1. Locate the site's ATM/SONET fiber-optic cable for this connection.

   Note: This external cable is supplied by the customer. External cables and all cabling for the site's ATM switch fabric must conform to the ATM specification. See "Site Cabling" in Chapter 1 for complete details.

2. Optional: Put labels on the panel plate and cables.

3. Remove the protective cap from the cable's connector.

   Note: Do not touch the fiber-optic material.

4. Clean and dry the tip of each fiber within the cable's connector, following the instructions in "Cable Care and Cleaning" in Chapter 1, by gently rubbing the tip with a soft, lint-free cloth that has been moistened with reagent grade isopropyl alcohol (isopropanol 92%). If you do not have the proper equipment, skip this step.

   Note: Do not use prepared cleaning compounds, such as tape-head cleaner or denatured (rubbing) alcohol.

5. Remove (pull out) the protective plugs from the board's receptacle.
6. Attach the external ATM cable to the IRIS ATM port.

   Orient the cable's connector with the dual-SC receptacle on the board's panel plate. The receptacle is keyed to ensure proper orientation. Insert the connector until the 2 parts snap together.
7. 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.

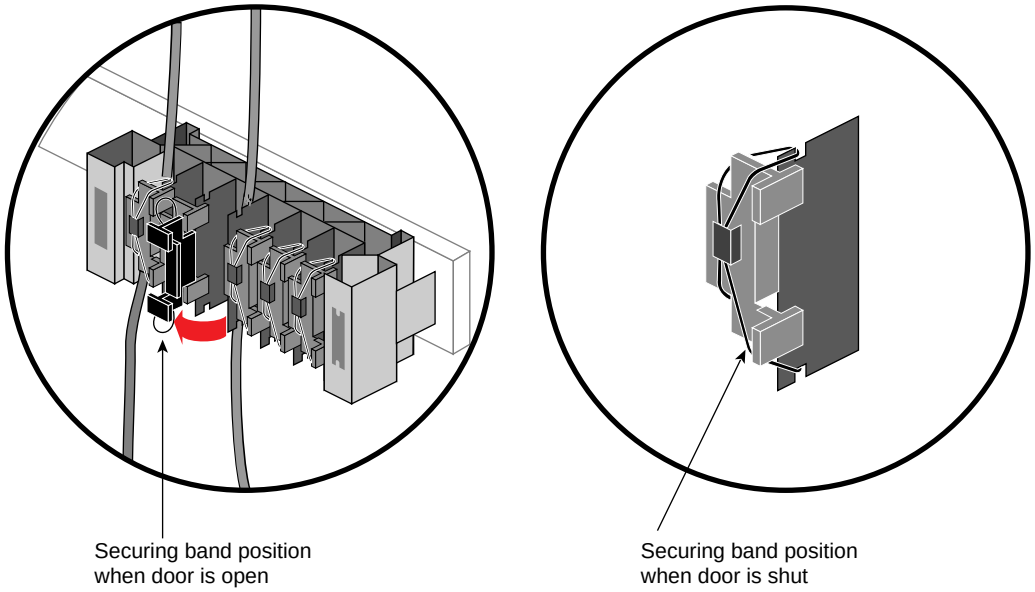


Figure 4-7 Door Operation for XIO Cable Management Box

   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.)
8. 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.
9. Proceed to "Finish."

4.8 Finish

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

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. Log in.
3. If you have not installed and configured the IRIS ATM software, do so now by following the instructions in the *IRIS ATM Configuration Guide*. The IRIS ATM connection cannot function until the software has been configured.

   Note: After you finish configuring the software, you must reboot the system (or run the *autoconfig* command) to build a new operating system (kernel) that includes the new driver. Then, you must again reboot the system to start running this new operating system.
4. Verify that the board's LEDs indicate normal operation, as illustrated by Figure 1-8.
5. Verify that the board has been located by the operating system during the bootup, with either of the following commands:

   ```
   % hinv -mvv | grep ATM
   QUAD_ATM Board:  barcode ######   part 030-0948-00# rev #
   ATM XIO 4 port OC-3c: module #, slot io#, unit # (ports: #-#)
   ```

   ```
   % find /hw/module -name atm
   /hw/module/#/slot/io#/quad_atm/pci/0/atm
   ```

   where the # after module and slot should correctly identify the chassis and XIO slot into which you installed the board.
6. Verify that the connection is operational by following the verification tests described in Chapter 2 of the *IRIS ATM Configuration Guide.*