# 100Base-T VME Board Installation Instructions

Document Number 108-0148-001

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**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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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This equipment has been tested to and is in compliance with the Level A limits per VDE 0871.

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**100BaseT VME Board Installation Instructions**
**Document No. 108-0148-001**

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

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# Introduction

This manual provides instructions on installing the 100Base-T (VME) board upgrade into the CHALLENGE® and Onyx® family of computer systems. This information is intended for Silicon Graphics® system support engineers (SSEs) and other field-certified personnel only.

This document is organized as follows:

Chapter 1 "General Product Information" provides an overview of the 100Base-T upgrade.

Chapter 2 "Installation" provides guidelines on how to properly install the upgrade kit parts and accessories into a system and how to configure them.

## Reference Information

The following documents provide an expanded information base that may be useful for filling in details on topics that are not covered in this guide.

### Technical Manuals

An electronic version of most of the hardware technical documents may be found by remote copying the files from the following location:

comrade.engr.sgi.com:/usr/people/guest/docdist/

### Technical Publications Library Web Site

To access the whole library of Silicon Graphics documentation (including end-user, developer, field service, networking, and system administration manuals) check the following site:

http://techpubs.engr.sgi.com

### Patch and Release Note Information

For pertinent patch information, see the Global Customer Service (GCS) or the SGI Technical Support (Oasis) Web pages at the following sites:

- http://bits.csd.sgi.com/digest/patches/
- http://morpheus.corp/oasis.html

  **Note:** This Web site also contains release note information.

### New Product Information (NPI)

New Product Information (NPI) files contain information about newly released products. such as part numbers, product dependencies, compatibility issues, and related documentation.

An NPI is generated by the Global Customer Service (GCS) group when a new version of a product is released. For a listing of NPIs and any related information, see the following Web location:

http://bits.csd.sgi.com/cgi-bin/build_npi_html.sh

## Your Feedback

The service publications group at Silicon Graphics is interested in your comments on this manual. Send any feedback regarding content, technical errors, or needed additions to *techpubs@sgi.com*. Be sure to include the title and part number of the document in your e-mail.

## Safety Information

Be sure to read the following information before you begin installation.

**Warning:** **Installation of these upgrades requires specific training and technical knowledge. These instructions are provided for use by Silicon Graphics system support engineers (SSEs) or other Silicon Graphics trained personnel only. This equipment utilizes electrical power internally that is hazardous if the equipment is improperly disassembled.**

**Caution:** This equipment is extremely sensitive and susceptible to damage caused by electrostatic discharge (ESD). ESD is an electrical discharge caused by the build-up of electrostatic potential on clothing and other materials. You must use proper ESD preventive measures and observe these precautions:

- Connect a ground strap to your wrist when connecting and disconnecting peripherals.

- Be sure that you and all of the electrical equipment that you handle during this installation are at a ground potential of zero to avoid damage from ESD.
- Keep the boards or drives in the antistatic bags provided. Remove a board from its antistatic bag only when you are properly grounded with a ground strap, and only when you are working on the board or installing it.
- Do not use an ohmmeter on a board.

## Typographical Conventions

These type conventions and symbols are used throughout this manual:

| | |
|---|---|
| *Italics* | Variables |
| `Screen type` | Screen displays |

*Chapter 1*

# General Product Information

The 100Base-T fast Ethernet (VME) board provides up to 100 Mbps transfer rate between systems. The board has a 6U form factor and is installed in a 9U carrier (see Figure 1-1). The 100Base-T board supports two independent PCI Mezzanine Cards (PMC). Each mezzanine card supports one autosensing 10/100Base-TX interface. Signals are brought to an RJ45 jack and connector plate which mount on the system I/O panel.

Compared with previous 10 Mbps Ethernet versions, the 100Base-T board produces a tenfold increase in the speed of the packets over the media system. However, the other important aspects of the Ethernet system including the frame format, the amount of data a frame may carry, and the media access control mechanism, are all unchanged.

**Note:** There are two versions of the 100Base-T board: a VMEbus board and a GIO bus board. The GIO bus board version installs into Indy® systems. This manual documents the VME board version.

## 1.1 100 Mbps Media Systems

There are three media varieties specified for transmitting 100-Mbps Ethernet signals that meet IEEE approval:

- 100Base-T4
- 100Base-TX
- 100BaseFX

**Note:** This upgrade uses the 100Base-TX implementation.

The IEEE identifiers include three pieces of information. The first item, “100”, stands for the media speed of 100-Mbps. The “BASE” stands for “baseband,” which is a type of signaling. Baseband signaling simply means that Ethernet signals are the only signals carried over the media system. The third part of the identifier provides an indication of the segment type.

The “T4” segment type is a twisted-pair segment that uses four pairs of telephone-grade twisted-pair wire. The “TX” segment type is a twisted-pair segment that uses two pairs of wires and is based on the data grade twisted-pair physical medium standard developed by ANSI. The “FX” segment type is a fiber optic link segment that uses two strands of fiber cable and is based on the fiber optic physical medium standard developed by ANSI.

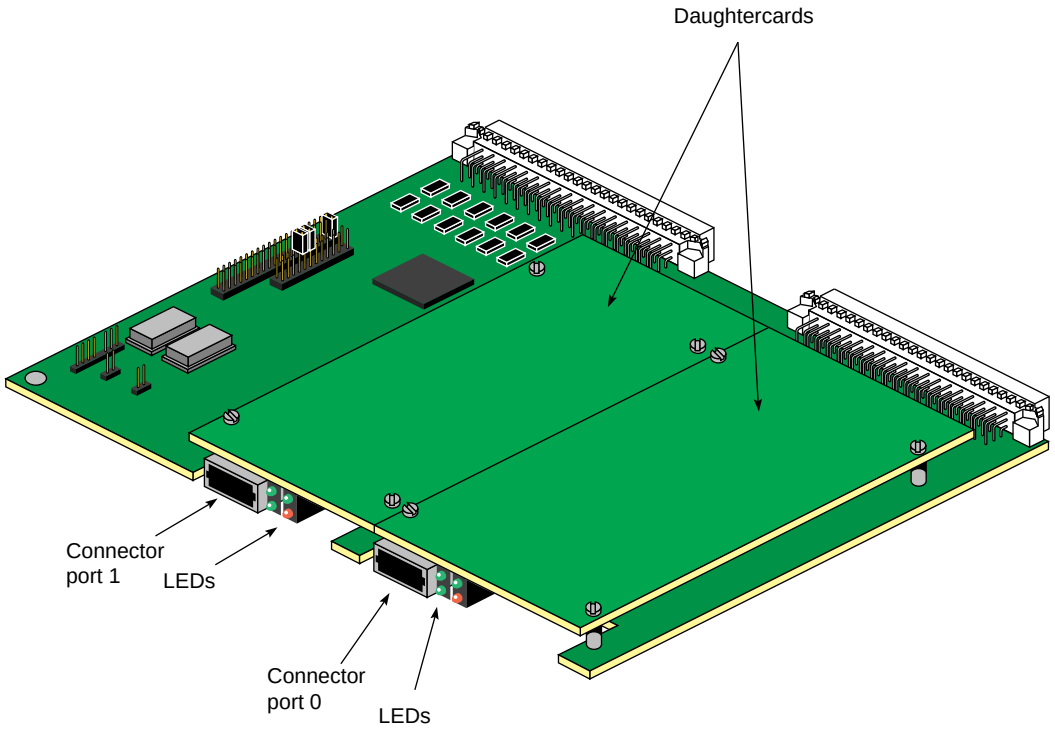


**Figure 1-1** 100Base-T Board

**Note:** The 100Base-TX (100Base-T) system operates over two pairs of wires, one pair for receive data signals and the other pair for transmit data signals.

## 1.2 Supported Platforms

The following systems support the 100Base-T VME board.

- CHALLENGE L or XL
- POWER CHALLENGE™ L or XL
- Onyx deskside or rackmount systems
- POWER Onyx™ deskside or rackmount systems

**Note:** There is no support for alternate media interfaces, such as 100Base-T4, 100BaseFX and 100Base-VGAnyLan. There is also no support for an external MAC interface or Media Independent Interface (MII).

## 1.3 Required Software

The 100Base-T upgrade requires IRIX™ 5.3, 6.2 or later for operation. The driver software is provided on a separate CD that ships with the upgrade.

*Chapter 2*

# Installation

This chapter describes how to install the 100Base-T board upgrade into the CHALLENGE and POWER CHALLENGE L (deskside) and XL (rackmount) systems and also the Onyx and POWER Onyx deskside and rackmount systems.

Installation consists of the following major steps:

- verifying the kit contents
- checking the jumper settings on the board
- installing the 100Base-T board into a system
- jumpering the backplane (if a VME slot or slots are skipped)
- connecting the board to the I/O panel
- installing software
- verifying installation

**Note:** Since the 100Base-T board has an autosensing 10/100 Mpbs Base-TX interface, it can operate (receive and transmit) with 10-Mbps Ethernet boards.

## 2.1 Safety Precautions

This section provides important guidelines to follow during installation.

**Warning:** **Installation of these upgrades requires specific training and technical knowledge. These instructions have been provided for use only by Silicon Graphics' system support engineers (SSEs) or other Silicon Graphics-trained personnel. This equipment utilizes electrical power internally that is hazardous if the equipment is improperly disassembled.**

**Caution:** This equipment is extremely sensitive and susceptible to damage caused by electrostatic discharge (ESD). ESD is an electrical discharge (spark) caused by the build-up of electrostatic potential on clothing and other materials. You must use proper ESD preventive measures and observe these precautions:

- Connect a ground strap to your wrist when connecting/disconnecting peripherals.
- Be sure that you and all the electrical equipment that you handle during this installation are at ground potential to avoid damage from ESD.

- Keep the boards or drives in the antistatic bags provided. Remove a board from its antistatic bag only when you are properly grounded with a ground strap, and only when you are working on the board or installing it.
- Do not use an ohmmeter on a board.

## 2.2 Kit Contents

Table 2-1 shows the major components of the 100Base-T upgrade (C8-100BT).

**Table 2-1** 100Base-T Upgrade Contents

| Item | P/N |
|---|---|
| Two-port 100 Base-T VME faster Ethernet board | 013-1616-001 |
| VME 100Base-T 6U assembly | 013-1618-001 |
| Adapter extender 6U-9U | 040-1316-001 |
| PCA VME 100Base-T motherboard | 030-0979-001 |
| PCA PMC VME 100Base-T | 030-0980-001 |
| Driver software | SC4-FASTENET-1.0 |
| Cable assembly 100Base-T 6U-bulkhead | 018-0551-001 |
| VME 100Base-T bulkhead assembly | 013-1617-001 |

## 2.3 Verifying the Jumper Settings

The 100Base-T board should already be configured with the correct jumper settings (see Table 2-2 and Figure 2-1). However, you should double check the settings as outlined in this section.

**Table 2-2** 100Base-T Jumper Settings

| Jumpers | Function | Setting |
|---|---|---|
| J1 | Board reset switch (for manufacturing debug only) | None |
| J2 | PCI bus reset switch (for manufacturing debug only) | None |
| J3 (Not present) | Not applicable | None |
| J4 | In system programming header | None |
| J5 | Power-on option | None |
| J6 | Power-on option | None |

**Table 2-2 (continued)** 100Base-T Jumper Settings

| Jumpers | Function | Setting |
|---|---|---|
| J7 | Power-on option | None |
| J8 | Board addressing | See Figure 2-1 and Note |

**Note:** The 100Base-T board comes with the default setting for board 0.

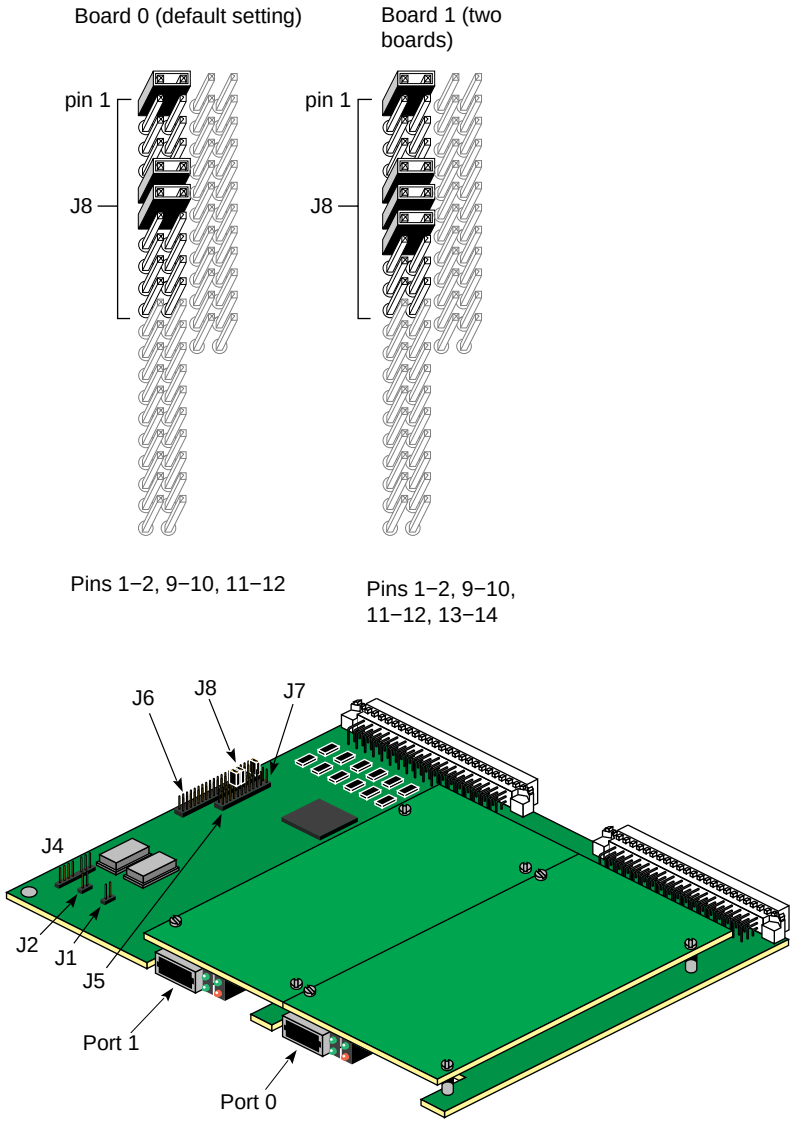


**Figure 2-1** Jumper Settings for Board Address Number

## 2.4 Installing the 100Base-T Board

See Figure 2-2 through Figure 2-4 and follow these instructions to install the 100Base-T board into the CHALLENGE and POWER CHALLENGE L (deskside) and XL (rackmount) systems and also the Onyx and POWER Onyx deskside and rackmount systems.

Depending upon the system type and the number of available VME slots, you can install up to two 100Base-T boards (four Ethernet interfaces).

**Note:** If you have a rackmount system with the third cardcage option and multiple VMEbuses, it recommended that a single, two port board be configured per VMEbus. This should help improve overall system throughput, given the high data rate capability of the 100Base-T option. In addition, the bus should have no other high speed peripheral interfaces.

**Caution:** The components are extremely sensitive to ESD (electrostatic discharge). Use proper antistatic procedures while handling all components.

1. Prior to your arrival, have the customer back up the system. Power off the system using a command such as the following:

   ```
   shutdown -y -g0
   ```

2. Remove all cables from the I/O door, then open up the door.
3. Select the appropriate board number address for the 100Base-T board, by changing the jumper settings (see Table 2-2 and Figure 2-1) for more information.

   **Caution:** If you are installing more than one 100Base-T board, ensure that each board is assigned a different board number address. See Table 2-2 and Figure 2-1.

   **Note:** If you are installing only one board, the 100Base-T board should already be correctly configured as board number 0. Depending on the number of available VME slots, a system can support up to two 100Base-T boards.

4. Pick an available VME board slot (refer to Figure 2-3, Figure 2-4, and Table 2-3). When installing VME boards, use the leftmost available slot first and continue installing boards to the right without skipping any slots. This sequence is required since the backplane loops the signals from the left slot to the next slot to the right. Any skipped or open slot interrupts the signal flow to subsequent slots.

   **Caution:** Even if you are using a VME slot located farthest to left, it is a good idea to check the backplane for possible jumpers from a previous installation. If backplane jumpers for this slot are installed, remove them.

   **Note:** If you need to skip a VME slot, remember to install backplane jumpers in the appropriate location. See Section 2.5, “Jumpering a Skipped VME Slot,” for more details.

**Table 2-3** VME Slot Positions for CHALLENGE and Onyx Systems

| System Chassis | VME Slot Positions |
|---|---|
| CHALLENGE L (deskside) | 7 through 11 |

**Table 2-3** VME Slot Positions for CHALLENGE and Onyx Systems

| System Chassis | VME Slot Positions |
|---|---|
| CHALLENGE XL (rackmount) | Cardcage 1 (N/A)<br>Cardcage 2 (17 through 21)<br>Cardcage 3 (2 through 21) |
| Onyx deskside | 5 through 7 |
| Onyx rackmount | Cardcage 2 (N/A)<br>Cardcage 2 (13 through 15)<br>Cardcage 3 (2 through 4 and 13 through 15) |

5. Install the board into the VME slot. You should hear and feel the board snap into the board ejectors and backplane connectors. The board is now seated in the backplane.
6. Resecure the board lock bars across the top and bottom of the boards in the cardcage as applicable.
7. Next, remove a spare I/O plate from the I/O connector panel for each channel on the board.

   **Caution:** If you have a deskside system with RealityEngine graphics or Extreme graphics (AB4 or AB5), *do not* use the I/O plate positions on the connector panel that are called out in Figure 2-2.

8. Attach the 100Base-T bulkhead to the I/O panel.
9. Attach the cable assembly to the port 0 or port 1 connector on the board.
10. Reattach any I/O cables that have been removed.
11. With the I/O door still open, power on the system and watch the LEDs on the front panel of the 100Base-T board(s) to see if they are on.
12. Close the I/O door.

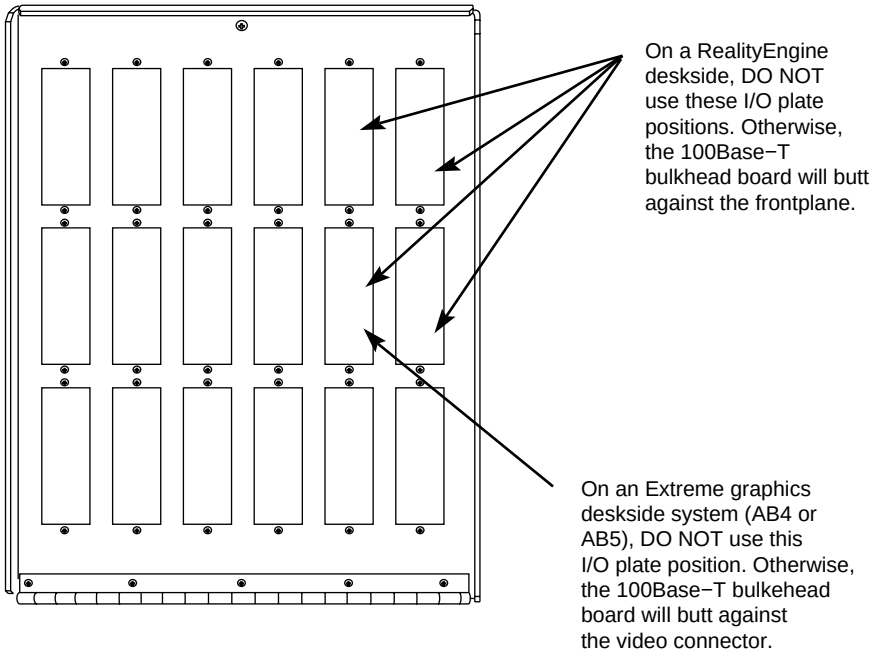


**Figure 2-2** Deskside I/O Connector Plate Problem Spots

**Caution:** There are I/O connector plate positions on certain deskside configurations that cannot be used for the 100Base-T bulkhead as shown in Figure 2-2.

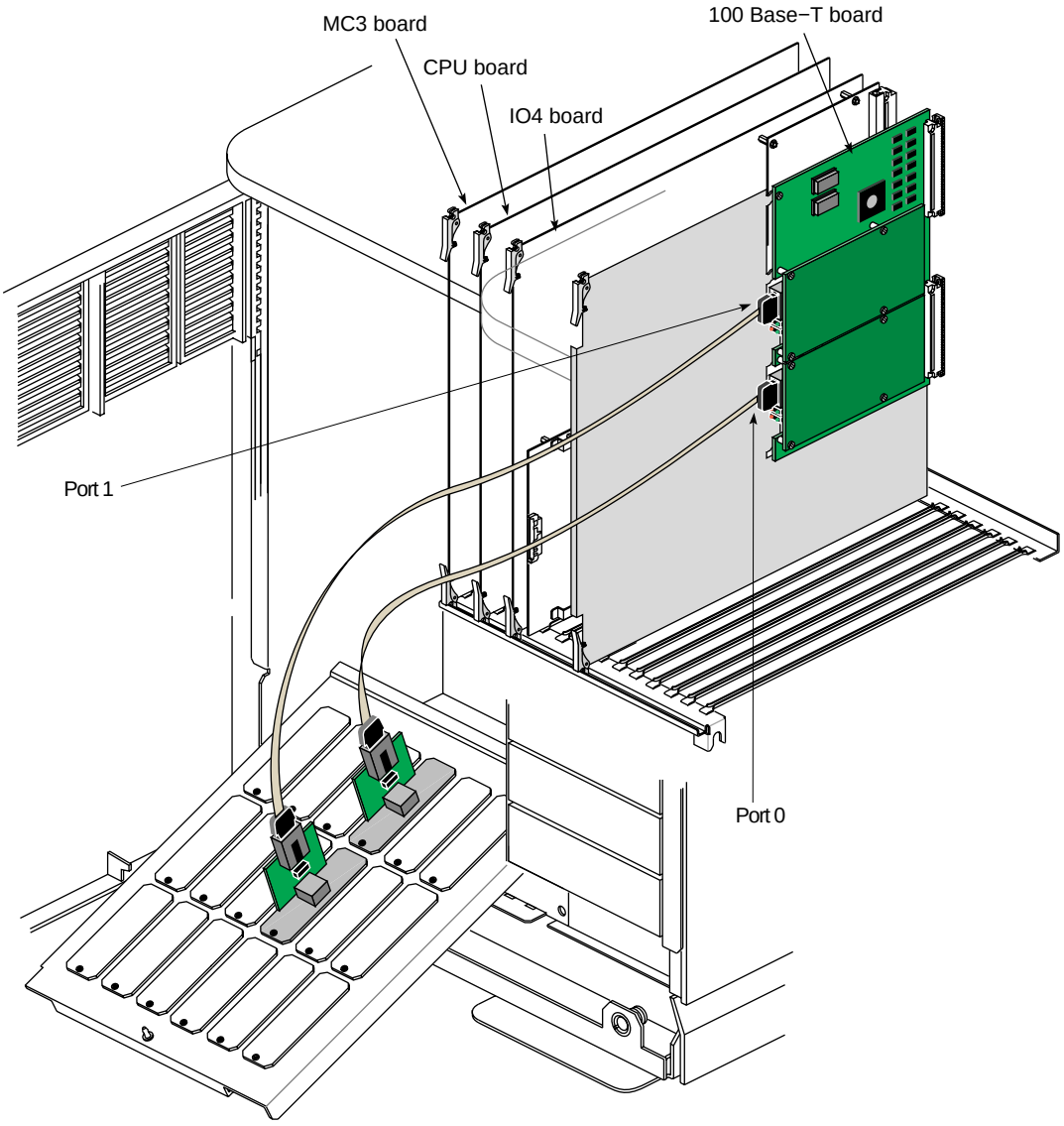


**Figure 2-3** Deskside Installation

**Caution:** If you have a deskside system with RealityEngine graphics or Extreme graphics (AB4 or AB5), *do not* use the I/O plate positions on the connector panel that are called out in Figure 2-2.

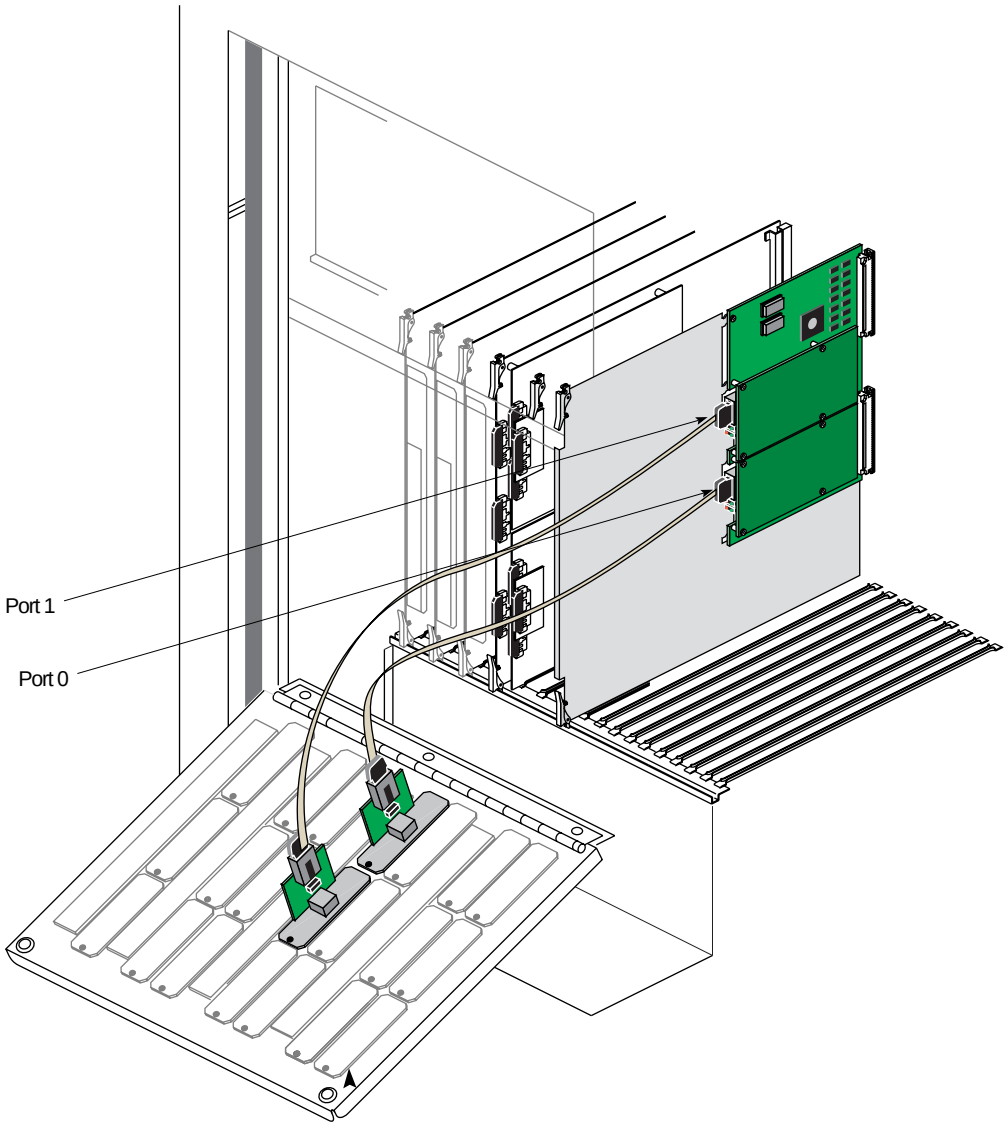


**Figure 2-4** Rackmount Installation

## 2.5 Jumpering a Skipped VME Slot

VME boards should be installed left to right, starting with the first available slot on the left. However, skipping a slot is occasionally required to fit oversized VME boards or improve air flow. A slot can be skipped if jumper blocks are placed on the appropriate VME jumper block pins (or headers) located on the rear of the backplane (see Figure 2-5).

**Note:** If you install the VME boards in order (from left to right) without skipping, starting with the VME slot farthest to the left, then no jumpering is required.

The general guideline is to insert jumpers into the jumper banks corresponding to the VME slot number that you are skipping. For example, if you are skipping the first VME slot, you need to insert jumpers into jumper bank 1. See the following additional examples:

- If you are skipping the first VME slot (for example, slot 7 in a CHALLENGE L system) to use the next VME slot, you must place five jumpers in the jumper bank, designated as slot 1 (see Figure 2-5).
- If you are skipping the first two VME slots and wish to use the third VME slot, you must place jumpers in jumper banks 1 and 2.
- If you wish to skip over VME slots, for example, from the first VME slot to the third VME slot, you must place jumpers in bank 2.

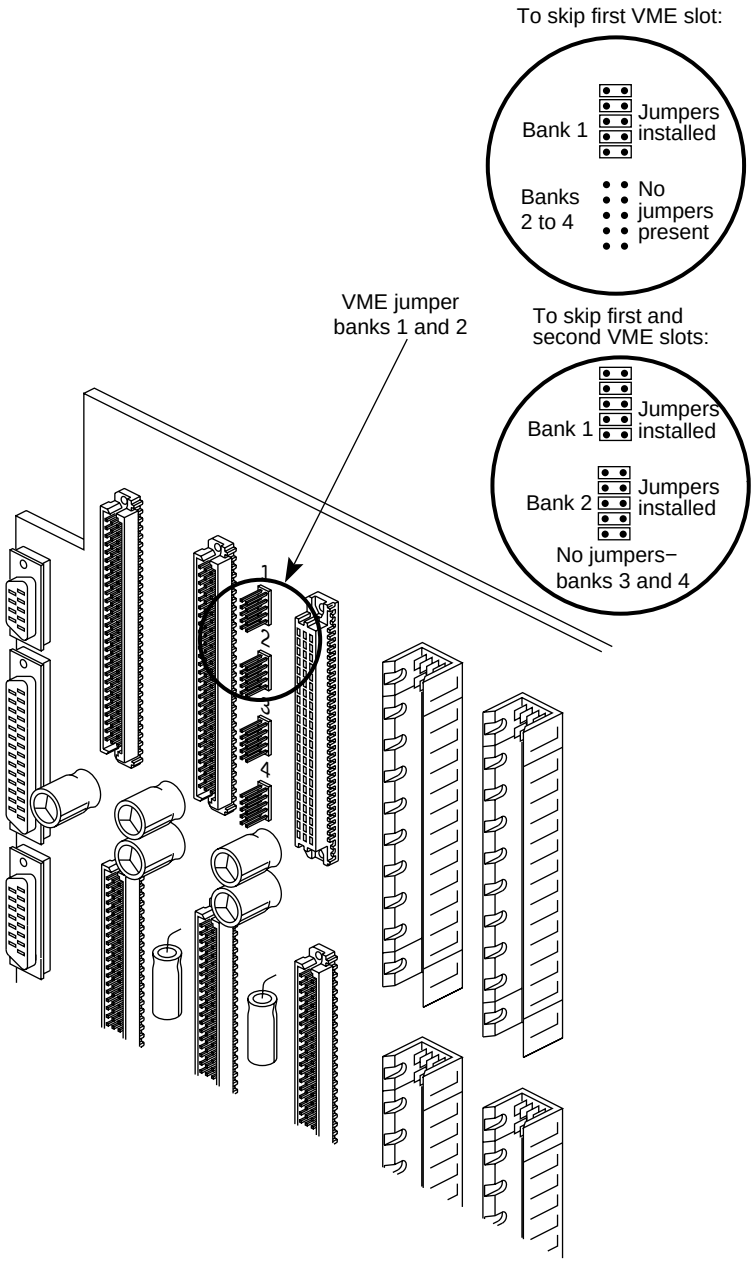


**Figure 2-5** Installing VME Jumper Blocks on Rackmount (XL) Backplane (Example Only)

## 2.6 Installing and Reconfiguring the 100Base-T Board Software

Follow these instructions to install and reconfigure the 100Base-T board software:

**Note:** The 100Base-T board requires IRIX version 5.3 or 6.2 or later for proper support.

1. Power-on the system, open up a shell, and become superuser.
2. Insert the 100Base-T CD-ROM and use *inst* to install the software. For example,

   **`inst -f /CDROM/dist/if_vfe`**
3. Rebuild the kernel by entering the following command at the shell prompt as superuser:

   **`autoconfig -v`**

   This command announces the presence or absence of all optional boards in the system as follows:

   `exprobe spaced if_vfe adapter` *n*
   `if_vfe, adapter` *n* `exprobe space`

   The variable *n* indicates the VMEbus or adapter number.
4. Reboot and reconfigure the system.

## 2.7 Verifying Hardware Installation

After powering on the system, here is what you see at boot time (without showconfig set).

If only board 0 is installed:

```
IP-6200 100Base-TX EtherNet Ver 1.0 (0612A00) - A16[0x6000],
A32[0x19500000]
```

board 1 gives:

```
IP-6200 100Base-TX EtherNet Ver 1.0 (0612A00) - A16[0x7000],
A32[0x19600000]
```

**Note:** The variable `(0612A00)`may different in your bootup display.

The *hinv* command will *not* recognize the 100Base-T board(s) even if the 100Base-T software driver has been installed and configured.