

**Silicon Graphics® Octane® and Octane2™
VPro™ Graphics Upgrade Kit
Installation Guide**

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Silicon Graphics® Octane® and Octane2™ VPro™ Graphics Upgrade Kit Installation
Guide

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Silicon Graphics® Octane® and Octane2™ VPro™ Graphics Upgrade Kit Installation Guide

Welcome to VPro graphics, an SGI technology!

This guide shows you how to perform a VPro graphics upgrade on your Octane or Octane2 workstation.

Caution: To install VPro V10 or V12 graphics in an Octane or Octane2 workstation, you must begin the upgrade process by checking for the required frontplane xbow (version 1.4 or later), as described on page 2. To install VPro V6, V8, V10, or V12 graphics in an Octane workstation with an XIO Quad-Module installed (no current VPro graphics), you must also check for the required power supply and base version of IRIX (6.5 or later), as described on page 4. If your workstation currently has a properly installed VPro graphics board, this ensures that you have the correct power supply and are running the correct base version of IRIX.

This guide covers the following topics:

- “Checking Your Shipment” on page 2
- “Checking the Frontplane Xbow (for VPro V10 and V12 Upgrades)” on page 2
- “Checking the Power Supply and Operating System (for Octane Workstations with Quad-Modules Installed)” on page 4
- “Upgrading the Operating System and Flashing the PROM” on page 6
- “Preparing Your Workstation” on page 7
- “Removing an XIO Quad-Module (For Octane Workstations without VPro Graphics)” on page 11
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- “Verifying the Option Board Installation” on page 27
- “Pinout Assignments for VPro Graphics Board I/O Ports” on page 27

Checking Your Shipment

The following items are included with this shipment:

- IRIX Upgrade CDs
- IRIX patch CD (for V10 and V12 Upgrades)
- Wrist strap
- Reversible Phillips screwdriver
- VPro Graphics XIO Tri-Module with VPro V6, V8, V10, or V12 graphics board

Checking the Frontplane Xbow (for VPro V10 and V12 Upgrades)

Note: If you are installing a VPro V6 or V8 graphics board, skip this section.

To install a VPro V10 or V12 graphics board, your workstation must have frontplane xbow 1.4 or later. If your system is running IRIX 6.5.9 or earlier, verify this information as follows:

1. Shut down your system.
2. Restart your system.
3. While the system is booting, press the **Esc** key.
The PROM menu appears.
4. Choose **Enter Command monitor** in the PROM menu.
The Command line interface screen appears.

5. Enter **system**.

Xbow(rev 1.4 or later) should appear under Chips/NICs.

If Xbow(rev 1.4) appears, continue with the installation instructions

If Xbow(rev 1.3 or earlier) appears, you cannot install a VPro V10 or V12 graphics board. Call you SGI Sales representative for upgrade information

If your system is running IRIX 6.5.10 or later, you can also verify this information as follows:

1. Open a Unix shell.
2. Enter **hinv** to display the hardware inventory list.

Xbow ASIC: Revision 1.4 should appear in the list.

If Xbow ASIC: Revision 1.4 appears, continue with the installation instructions.

If Xbow ASIC: Revision 1.3 or earlier appears, you cannot install a VPro V10 or V12 graphics board. Call you SGI Sales representative for upgrade information.

Checking the Power Supply and Operating System (for Octane Workstations with Quad-Modules Installed)

If you have an Octane workstation with a Quad-Module installed, this means it does not have a VPro graphics board installed. For such systems, you must check for the required power supply and the correct base operating system.

Note: If your workstation currently has a VPro graphics board installed, skip this section, and go to “Upgrading the Operating System and Flashing the PROM” on page 6.

1. Check your power supply by entering `hinv -m` in a command line window.

The hardware inventory list appears, as shown in the example in Figure 1.

```

xwsh
# hinv -m
      PM10 Board: barcode GLZ833      part 030-1355-001 rev A
      IP30 Board: barcode JZK613      part 030-1467-001 rev C
      PWR.SPPLY.ER Board: barcode AAE9020639 part 060-0035-001 rev A
      FP1 Board: barcode EFV053       part 030-0891-003 rev A
      GM10 Board: barcode DJF469      part 030-0930-003 rev L

1 300 MHz IP30 Processor
CPU: MIPS R12000 Processor Chip Revision: 2.2
FPU: MIPS R12010 Floating Point Chip Revision: 0.0
Main memory size: 320 Mbytes
Instruction cache size: 32 Kbytes
Data cache size: 32 Kbytes
Secondary unified instruction/data cache size: 2 Mbytes
Integral SCSI controller 0: Version QL1040B (rev. 2), single ended
  Disk drive: unit 1 on SCSI controller 0
Integral SCSI controller 1: Version QL1040B (rev. 2), single ended
IOC3 serial port: tty1
IOC3 serial port: tty2
IOC3 parallel port: plp1
Graphics board: S1
Integral Fast Ethernet: ef0, version 1, pci 2
Iris Audio Processor: version RAD revision 12.0, number 1

```

Figure 1 Hardware Inventory List

2. Verify the following information in the third line of the hardware inventory list:

The part number for `PWR.SPPLY.ER` must be: `060-0035-00x`, where `x = 1` or higher, as shown in the example in Figure 1.

Note: If the above part number is not displayed for `PWR.SPPLY.ER`, you cannot install VPro graphics. To purchase the correct power supply, contact your authorized SGI sales representative. To install a new power supply, follow the instructions included with the power supply, or in Chapter 3 of your *Octane Workstation Owner's Guide*, then continue with step 3.

3. Check the version of your operating system by entering `uname -R` below the hardware inventory list, and verify the following information:

The version of IRIX displayed below `uname -R` must be: 6.5 6.5x or higher, where $x = m$ for Maintenance stream or f for Feature stream.

Note: If your workstation is not running IRIX 6.5 or higher, you cannot proceed with the VPro graphics installation. To purchase the correct operating system, contact your authorized SGI sales representative.

```

xwsh
# hinv -m
      PM10 Board: barcode GLZ833      part 030-1355-001 rev A
      IP30 Board: barcode JZK613      part 030-1467-001 rev C
      PWR.SPPLY.ER Board: barcode AAE9020639 part 060-0035-001 rev A
      FP1 Board: barcode EFV053       part 030-0091-003 rev A
      GM10 Board: barcode DJF469      part 030-0938-003 rev L
1 300 MHZ IP30 Processor
CPU: MIPS R12000 Processor Chip Revision: 2.2
FPU: MIPS R12010 Floating Point Chip Revision: 0.0
Main memory size: 320 Mbytes
Instruction cache size: 32 Kbytes
Data cache size: 32 Kbytes
Secondary unified instruction/data cache size: 2 Mbytes
Integral SCSI controller 0: Version QL1040B (rev. 2), single ended
Disk drive: unit 1 on SCSI controller 0
Integral SCSI controller 1: Version QL1040B (rev. 2), single ended
IOC3 serial port: tty1
IOC3 serial port: tty2
IOC3 parallel port: p1p1
Graphics board: SI
Integral Fast Ethernet: ef0, version 1, pci 2
Iris Audio Processor: version RAD revision 12.0, number 1
#
# uname -R
6.5 6.5.4m

```

Installed version of IRIX →

Figure 2 Displaying the Installed Version of IRIX

Upgrading the Operating System and Flashing the PROM

To install VPro graphics, your workstation must have IRIX 6.5.10 or later installed. VPro V6 and V8 boards require PROM revision 4.0 or later. VPro V10 and V12 boards require PROM revision 4.5 or later. If you have the correct power supply and IRIX 6.5 or later is installed, you can upgrade your operating system and flash the PROM by using the IRIX Upgrade CDs.

To install IRIX 6.5.10 or later, and flash the PROM, follow the software installation instructions included with the IRIX Upgrade CDs.

Verifying the Operating System Installation

Verify the installation of IRIX 6.5.10 or later as follows:

In a command line window, enter `uname -R`.

Verifying the PROM Revision

Verify the PROM revision as follows:

1. While the system is booting, press the **Esc** key.

The PROM menu appears.

2. Choose **Enter Command monitor** in the PROM menu.

The Command line interface screen appears.

3. Enter `version` and verify the following:

`SGI version 6.5 Rev 4.5 IP30`, where 4.5 or later is the correct PROM revision for V10 and V12 boards (V6 or V8 boards are compatible with PROM revision 4.0 or later).

You can also verify your PROM revision by typing `flash -v` in a UNIX shell.

Installing the IRIX Patch for V10 and V12 Boards

Note: If you are installing a V6 or V8 board, skip this section.

After you upgrade your operating system and flash the PROM, restart your system, and then use the provided IRIX patch CD to install the required software patch. Follow the installation instructions in the release notes included with the IRIX patch CD, and then reboot your system.

Preparing Your Workstation

1. Open the cover and push the power button (see A in Figure 3) to power off your workstation.
2. Unplug the power cable (B).
3. Press the monitor power switch (C) to power off your monitor.

Wait 5 minutes before removing the XIO Quad-module or XIO Tri-Module.

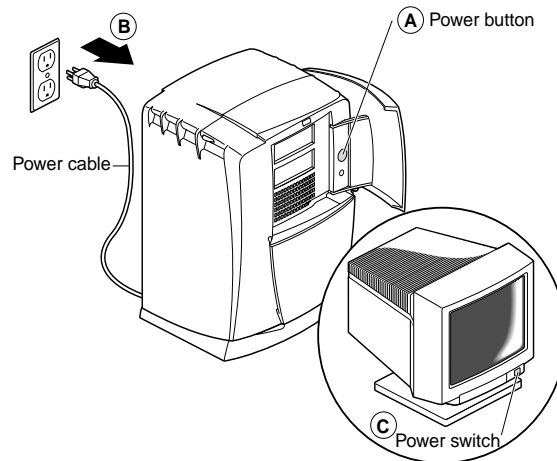


Figure 3 Powering Off the Workstation



Warning: The heat sinks on the XIO boards get very hot. Wait 5 minutes after powering off the workstation before you remove the XIO Quad-Module or XIO Tri-Module. Test before touching any of the XIO boards.

4. Remove all the cables from the XIO Quad-Module or XIO Tri-Module (only one is shown in Figure 4), then attach the wrist strap, as described in the next section.

For illustration purposes, the XIO Quad-Module is shown with the optional PCI module installed.

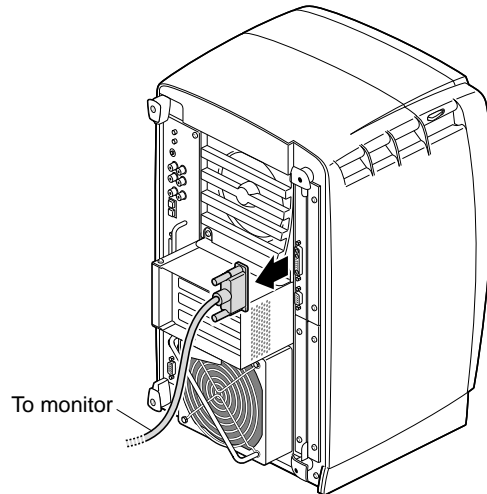


Figure 4 Removing the Monitor Cable

Attaching the Wrist Strap

Caution: The components inside the workstation are extremely sensitive to static electricity; you must wear the wrist strap while replacing parts inside the workstation.

To attach the wrist strap, follow these steps:

1. Unroll the first two folds of the band (see A in Figure 5).
2. Wrap the exposed adhesive side firmly around your wrist (B), unroll the rest of the band, and then peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to any exposed electrical ground, such as a metal part of the workstation (C).

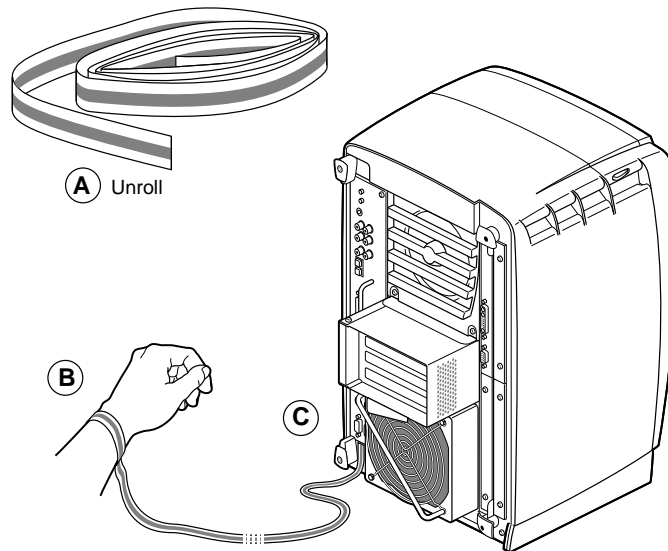


Figure 5 Attaching the Wrist Strap

Compression Connector Caution

Caution: The compression connectors on all XIO graphics boards and most option boards are very delicate and easily damaged. Do not touch or bump the gold bristled pad (see Figure 6). The connectors are on the side opposite the handles. Do not grab the back of the XIO module when you remove it, or the compression connectors may be damaged.

Always place a cap on all compression connectors after removing XIO boards. Caps are included with your workstation. Remove all caps from the compression connectors before installing XIO boards in your workstation.

Before you remove the XIO Quad-Module or XIO Tri-Module, read “Care and Cleaning of the Compression Connector in the appendix section of your *Octane or Octane2 Workstation Owner’s Guide*”

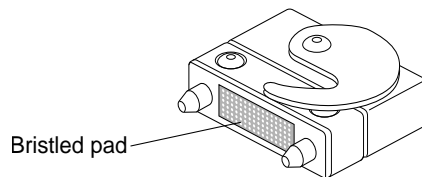


Figure 6 Identifying the Compression Connector

Removing an XIO Quad-Module (For Octane Workstations without VPro Graphics)

Note: If you are upgrading a workstation with VPro graphics currently installed, skip this section. Go to “About the XIO Tri-Module and XIO Boards” on page 15.

Octane workstations that do not have VPro graphics have a Quad-Module installed. Before you can install the XIO Tri-Module with VPro graphics, you must remove your Octane workstation’s XIO Quad-Module. Prepare your workstation as follows:

After you power off your workstation and attach the wrist strap, wait 5 minutes for the heat sinks to cool, then follow these steps to remove the XIO Quad-Module:

1. Use the provided Phillips reversible screwdriver to loosen the two captive screws in the XIO Quad-Module handles until the screws are disconnected from the chassis, as shown in Figure 7.

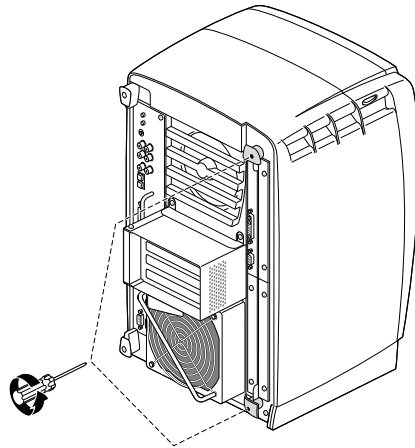


Figure 7 Loosening the XIO Module Screws



Warning: The heat sinks on the XIO boards get very hot. Wait 5 minutes after powering off the workstation before you remove the XIO module. Test before touching any of the XIO boards.

2. Grasp the handles and pull them until the XIO Quad-Module protrudes about an inch from the chassis, as shown in Figure 8.

The handles and XIO Quad-Module move out about 1 inch before the I/O panels move.

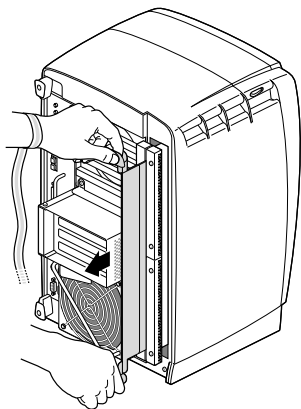


Figure 8 Releasing the XIO Quad-Module

3. Grasp the XIO Quad-Module along its length, and support the base of the module as you remove it from the chassis, as shown in Figure 9. Then place a cap on the compression connector, and store the XIO Quad-Module in an antistatic bag. Skip the next section and go to “About the XIO Tri-Module and XIO Boards” on page 15.

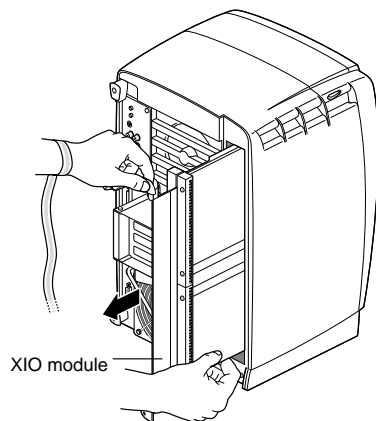


Figure 9 Removing the XIO Quad-Module

Removing an XIO Tri-Module (For Workstations with a VPro Graphics Board Installed)

If your workstation has a VPro graphics board installed and you are upgrading to a VPro V8, V10, or V12 board, remove the old Tri-Module as follows:

Note: If you removed a Quad-Module from an Octane Workstation (as explained earlier in this guide), skip this section and go to “About the XIO Tri-Module and XIO Boards” on page 15.”

Before removing the XIO Tri-Module, you must power off your workstation, wait 5 minutes to allow the heat sinks to cool, and attach the wrist strap.

1. Loosen the two captive screws in the XIO Tri-Module sliding handles with the supplied Phillips screwdriver, as shown in Figure 10, until the screws are disconnected from the chassis.

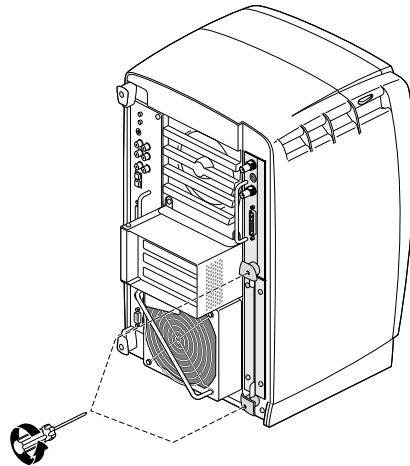


Figure 10 Loosening the XIO Tri-Module Screws



Warning: The heat sinks on the XIO boards get very hot. Wait 5 minutes after powering off your workstation before you remove the XIO Tri-Module. Test before touching any of the XIO boards.

2. Grasp the sliding handles and pull them until the sliding portion of the XIO Tri-Module protrudes about an inch from the chassis, as shown in Figure 11.

The sliding handles and XIO Tri-Module move out about one inch before the I/O panels move.

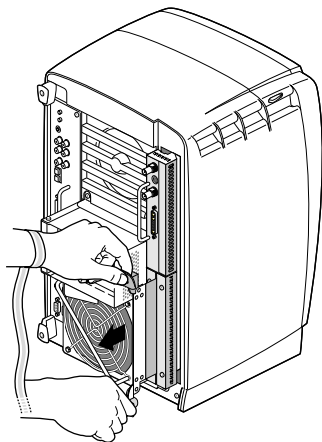


Figure 11 Releasing the XIO Tri-Module

3. Grasp the XIO Tri-Module by the immovable handle, and support the base of the module as you remove it from the chassis, as shown in Figure 12.

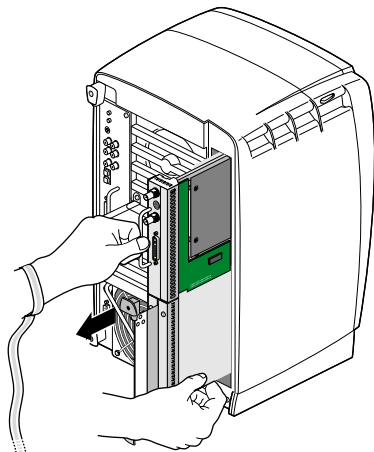


Figure 12 Removing the XIO Tri-Module

4. Place a cap on the VPro graphics board compression connector.
Spare caps are included with your workstation.
5. Place the old XIO Tri-Module in an empty antistatic bag.

About the XIO Tri-Module and XIO Boards

The XIO Tri-Module is a tray-like holding mechanism for VPro graphics and XIO option boards. You can connect up to three option boards to the XIO Tri-Module using slots A/B, C, and D. The VPro graphics board occupies slot A/B. Option boards or blank panels occupy slots B, C, and D.

- The VPro graphics board must occupy slot A/B (slot B is a daughterboard slot).
- You can install option boards in slots B, C, and D.
- Protective blank panels must be placed in unused slots.
- If you lose a screw that holds a single-layer option board or blank panel to the XIO Tri-Module, use M3 x 8 mm size screws. To hold option boards with attached daughterboards to the XIO Tri-Module, use the screw size listed in your option board manual.
- The VPro graphics I/O panel must be placed at the top as you insert the XIO Tri-Module, or damage can occur due to overheating.

Removing the XIO Tri-Module from Its Packaging

For all VPro graphics upgrades, follow these steps:

1. Remove the new XIO Tri-Module from its antistatic bag.
2. Place the antistatic bag on a flat surface, such as your desk.
3. Place the XIO Tri-Module on the antistatic bag.

When the XIO Tri-Module is out of the chassis, the sliding handles must protrude, as shown in Figure 13. If they do not protrude, pull them out about an inch.

A label identifies each XIO slot, (D and A on one side, C and B on the other). Slot B is a daughterboard slot that is located on the other side of the VPro graphics board.

4. Remove the cap from the compression connector, as shown in Figure 13.

Note: Do not push on the sliding handles. Later, when you reinsert the XIO Tri-Module, the sliding handles must protrude.

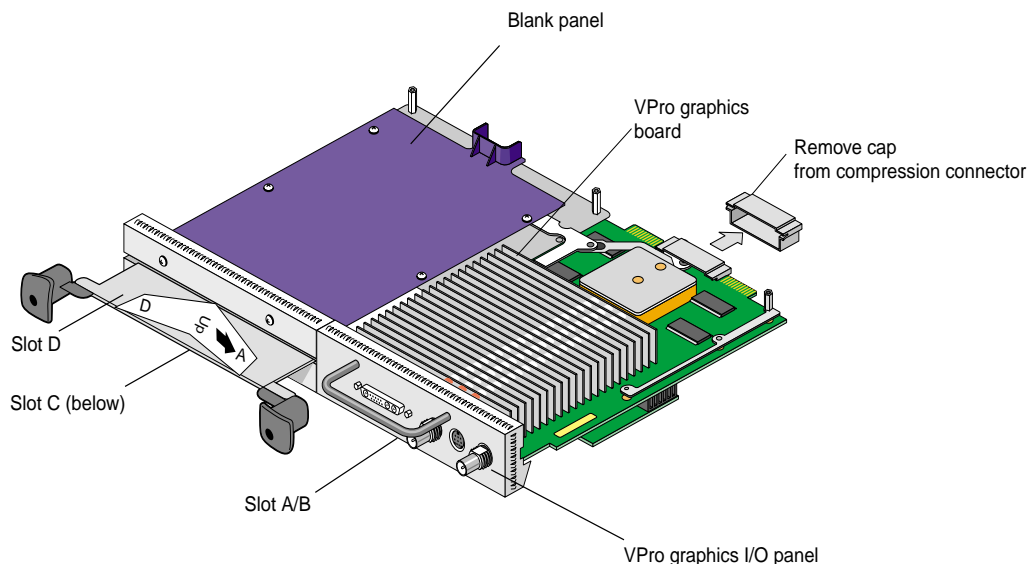


Figure 13 XIO Tri-Module

Installing the XIO Tri-Module

For all VPro graphics upgrades, follow these steps to install the appropriate VPro graphics board:

Caution: Install the XIO Tri-Module with the VPro graphics I/O panel aligned with the top of the workstation, as shown in Figure 14. The board can be damaged if aligned with the bottom of the workstation.

1. Make sure the cap is removed from the VPro graphics board's compression connector:
2. Slide the XIO Tri-Module into the guides on the top and bottom of the workstation.
3. Before you insert the XIO Tri-Module, make sure the sliding handles protrude in a locked position from the I/O panels, as shown in Figure 14.

If the sliding handles are flush with the I/O panels, the XIO Tri-Module will stop during insertion. Pull out the sliding handles until the sliding portion of the XIO Tri-Module looks like Figure 14.

4. Grasp the immovable handle with one hand while supporting the XIO Tri-Module with the other, and slide the module into the chassis.

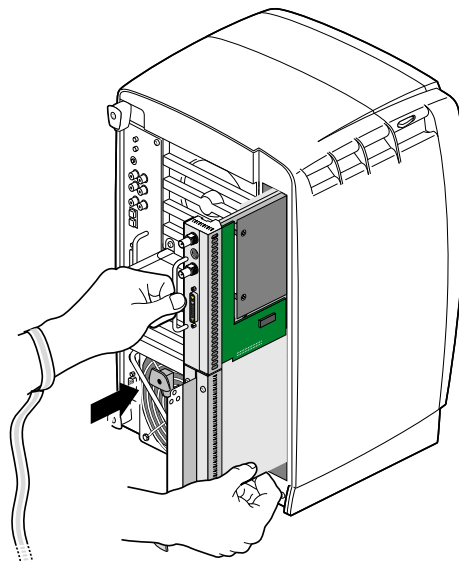


Figure 14 Inserting the XIO Tri-Module

5. Use the immovable handle to push the XIO Tri-Module into a locked position.
The I/O panels are nearly flush with the workstation when properly inserted, but there is a slight variation in the depth of the boards.
6. Push the sliding handles until the sliding portion of the module is flush with the workstation.
7. Tighten the captive screws in the sliding handles, as shown in Figure 15.
8. Remove the wrist strap.

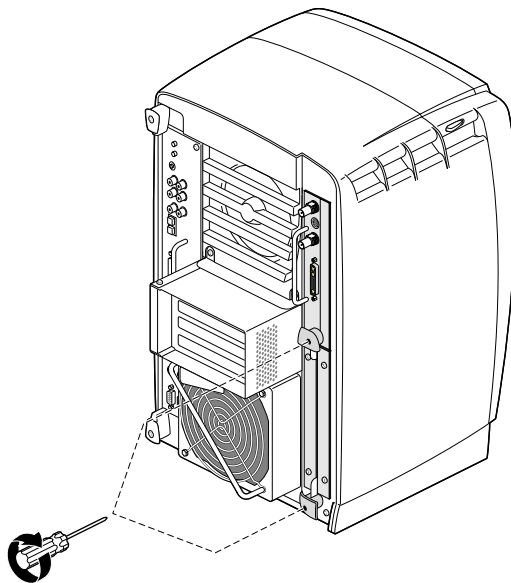


Figure 15 Tightening the XIO Tri-Module Captive Screws

9. Reconnect the monitor cable (see Figure 16) and all XIO cables to the XIO Tri-Module.
10. Connect any new cables to the XIO Tri-Module.

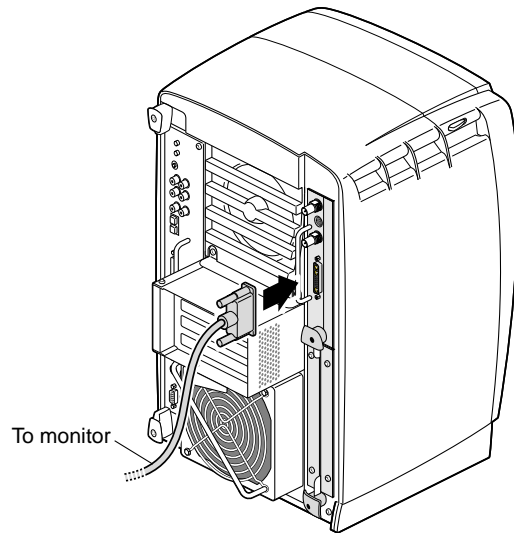


Figure 16 Reconnecting the Monitor Cable

The XIO Tri-Module installation is complete!

Figure 17 shows a workstation with an XIO Tri-Module installed. Each VPro graphics board I/O port is identified in the figure.

Now go to “Powering On the Workstation” on page 20.

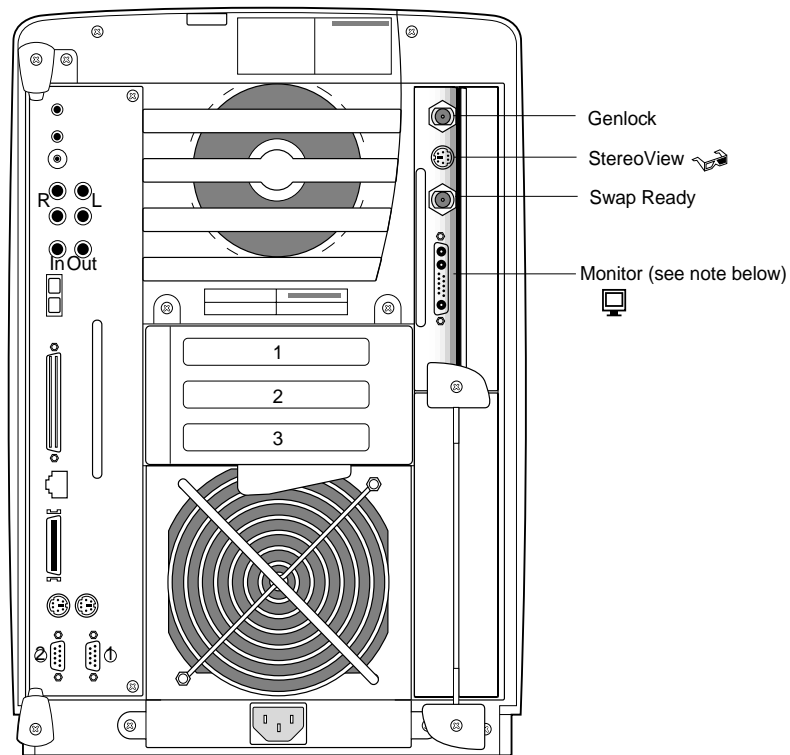


Figure 17 XIO Tri-Module with VPro Graphics I/O Ports

Note: VPro V10 and VPro V12 support more scan rates than VPro V6 and VPro V8.

Powering On the Workstation

1. Plug the power cable (see A in Figure 18) into an electrical outlet.
2. Press the power button (B) on the front of your workstation.
3. Press the monitor power switch (C) to power on your monitor.

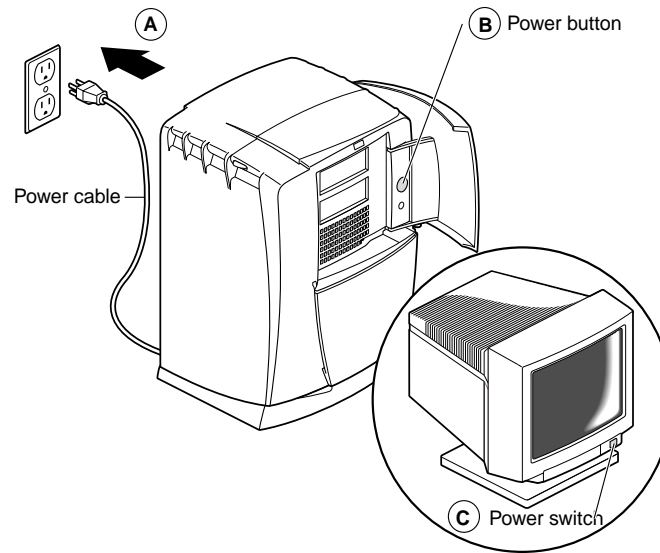


Figure 18 Powering On the Workstation

Verifying the VPro Graphics Installation

You can verify your VPro graphics board installation as follows:

1. From the Toolchest > Desktop, open a UNIX shell.
2. At the prompt, type: `hinv`.
3. Look for a line similar to this:
`graphics board: V6, V8, V10, or V12.`
4. If your system does not recognize the VPro graphics board, repeat the installation procedure.
5. If your system does not recognize the VPro graphics board after repeating the installation procedure, see the “Troubleshooting,” section in your *Octane or Octane2 Workstation Owner’s Guide*.
6. If your system does not recognize the VPro graphics board after following the troubleshooting procedures, contact your authorized SGI service representative.

Installing an XIO Option Board

Before installing an option board in slot C or D, you must power off your workstation, wait 5 minutes, attach the wrist strap, and remove the XIO Tri-Module, as described earlier in this guide. The VPro graphics board is always installed in slot A/B, as shown in Figure 19. Slot B is a daughterboard slot that is located on the other side of the VPro graphics board.

Note: For instructions on installing a daughterboard in slot B, see your daughterboard installation guide.

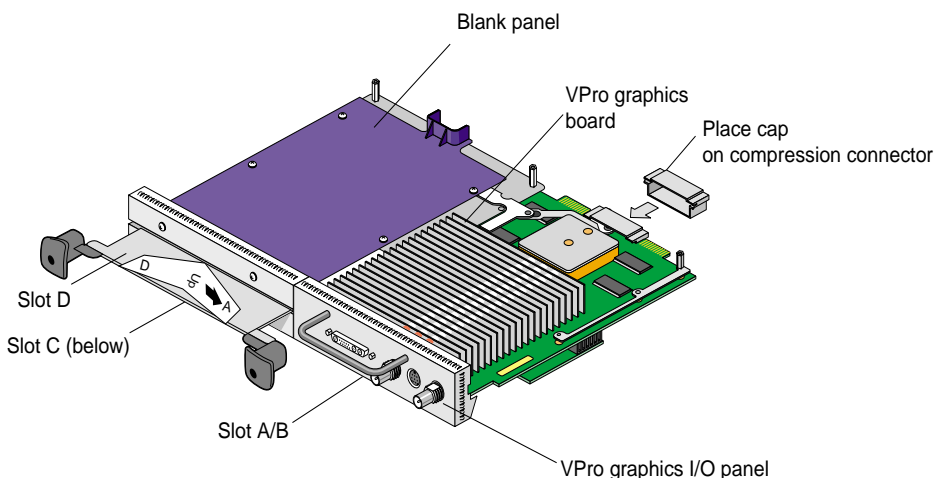


Figure 19 Identifying the Slots Used by an XIO Option Board



Warning: The heat sinks on the XIO boards get very hot. Wait 5 minutes after powering off your workstation before removing the XIO Tri-Module. Test before touching any of the XIO boards.

Note: Before you remove an option board, place a cap on the XIO compression connector (as shown in Figure 20) to prevent accidental damage when removing the board.

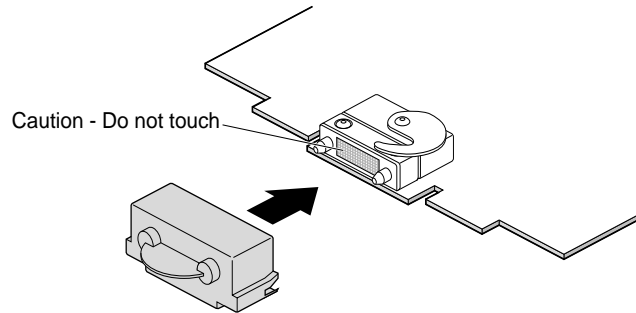


Figure 20 Placing the Cap on the XIO Compression Connector

Removing an XIO Option Board or Blank Panel

Before you install an option board in slot C or D, you *must* remove the protective blank panel or the option board currently installed in that slot. To remove an option board or a blank panel, follow these steps:

1. Using the supplied Phillips reversible screwdriver, remove the screws from the option board or blank panel occupying the desired slot, as shown in Figure 21.

Note: The following illustrations show you how to remove a blank panel.

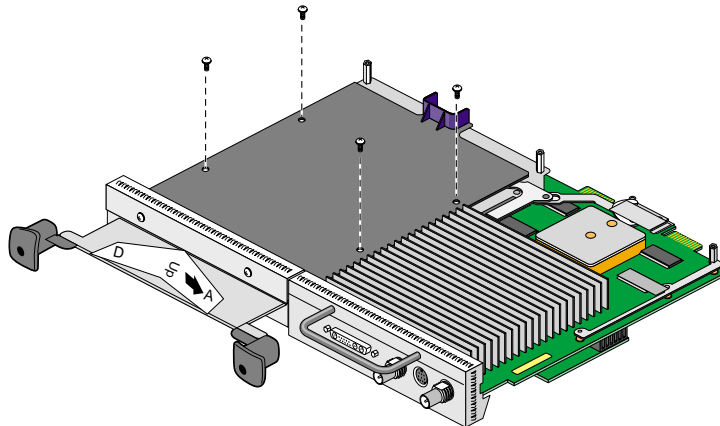


Figure 21 Removing the Screws from the Blank Panel

2. Grasp the blank panel or option board on the front and on the side of the board that has no connectors, and lift it, as shown in Figure 22.

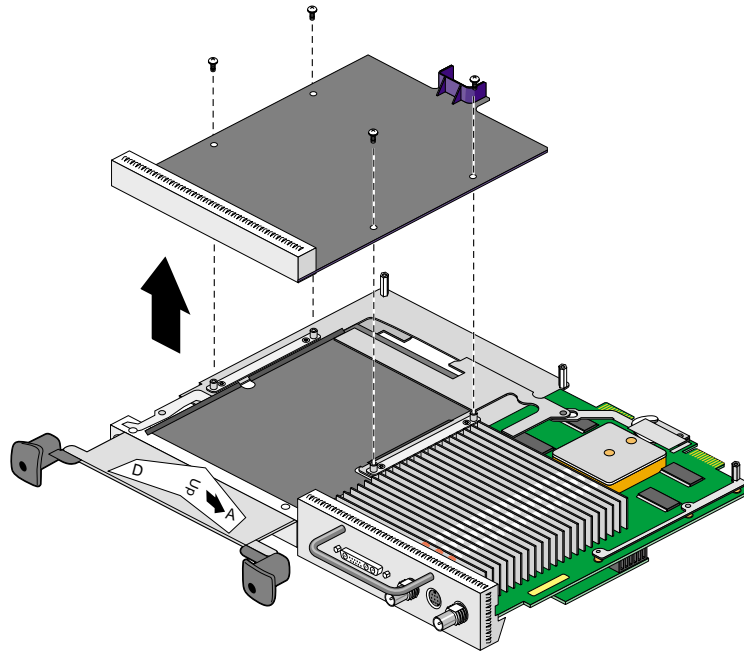


Figure 22 Removing the Blank Panel

3. With the same side facing up, place the blank panel or option board on a clean, antistatic surface.

Note: If you removed an option board, store it in an antistatic bag. If you removed a blank panel, store it in a safe place. In the future, if you remove an option board, you need to replace it with another option board or a blank panel.

To reinstall a blank panel, follow the same instructions for installing an option board, as described in the next section.

Installing the New XIO Option Board

Note: For complete instructions on installing your option board, refer to your option board installation manual.

1. Place the option board on the standoffs.

Some option boards must be placed in designated slots. Always check your option board installation manual for information about board placement or other pertinent information.

2. Install the screws (as shown in Figure 23), tightening the board to the standoffs.

Make sure all the slots are filled, with the VPro graphics board, and either an option board, or blank panel. The system does not cool properly if any of the slots is empty.

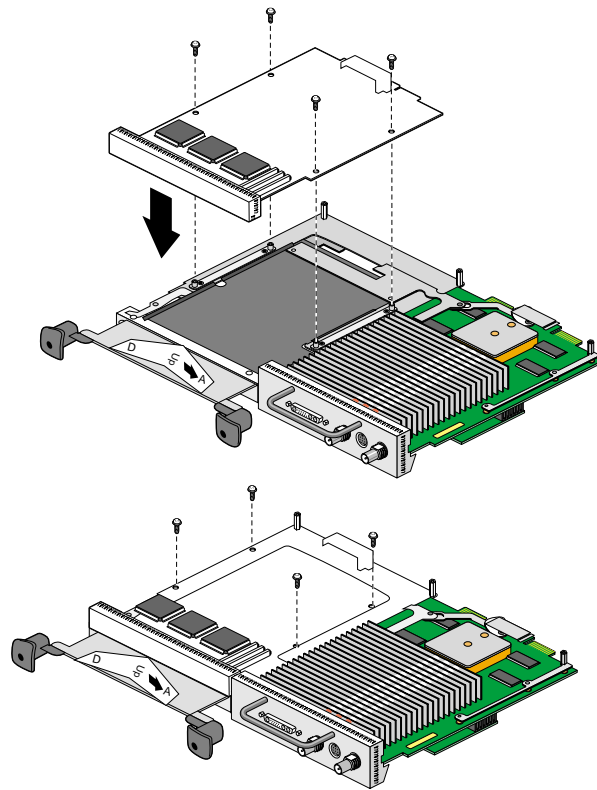


Figure 23 Installing the Screws

3. Remove the cap from the XIO compression connectors.
Keep the caps to protect the compression connector if you remove any XIO board.

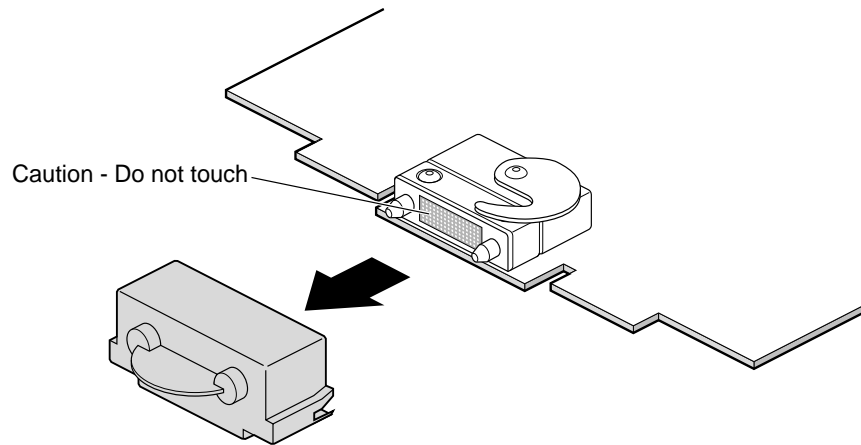


Figure 24 Removing the Cap from the Option Board Compression Connector

4. Reinstall the XIO Tri-Module, as described in “Installing the XIO Tri-Module” on page 17, then power on your workstation, as described in “Powering On the Workstation” on page 20.

Verifying the Option Board Installation

You can verify your option board installation by using the *hinv* command.

To verify that the system recognizes the option board, follow these steps:

1. Open a UNIX shell.
2. At the prompt, type: `hinv`.
3. Look for a line similar to this:

name of option board, module x slot x: revision x

If the system does not recognize your option board, repeat the installation procedure.

4. If the system still does not recognize your option board, refer to the “Troubleshooting” section in your *Octane or Octane2 Owner’s Guide* or your option board manual.
5. If you continue to have problems, contact your authorized SGI service representative.

Pinout Assignments for VPro Graphics Board I/O Ports

Genlock Port

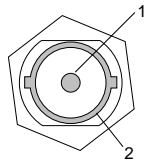


Table 1 shows the cable pinout assignments for the VPro graphics board Genlock port.

Table 1 Genlock Pinout Assignments

Pin	Assignment
1	Genlock input/output video or 3.3V TTL signal levels
2	Signal return ground

StereoView Port

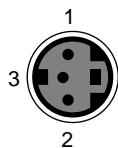


Table 2 shows the cable pinout assignments for the VPro graphics board StereoView port.

Table 2 StereoView Pinout Assignments

Pin	Assignment
1	+12V DC output to StereoView device
2	Ground
3	Stereo left/right Eye signal (1=left, 0=right) (STEREO_LEFT)

Swap Ready Port

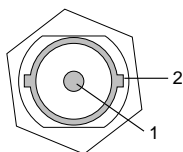


Table 3 shows the cable pinout assignments for the VPro graphics board Swap Ready port.

Table 3 Swap Ready Pinout Assignments

Pin	Assignment
1	Swapbuffer Gang Sync open collector I/O
2	Signal return ground

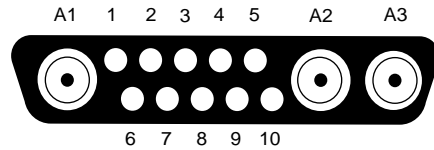
Monitor Port

Table 4 shows the VPro graphics board port pinout assignments for the Octane 20" monitor.

Table 4 20-inch Monitor Pinout Assignments

Pin	Assignment
A1	Red signal, analog
A2	Green signal, analog
A3	Blue signal, analog
1	Monitor ID bit 3, TTL
2	Monitor ID bit 0, TTL
3	Composite Sync (active low), TTL
4	Horizontal Sync (active high), TTL
5	Vertical Sync (active high), TTL
6	Monitor ID bit 1, TTL
7	Monitor ID bit 2, TTL
8	Ground
9	Ground
10	Ground

Note: VPro V10 and VPro V12 support more scan rates than VPro V6 and VPro V8.

Table 5 shows the VPro graphics board port pinout assignments for an Octane DDC- enabled monitor.

Table 5 DDC-Enabled Monitor Pinout Assignments

Pin	Assignment
A1	Red
A2	Green
A3	Blue
1	Data clock (SCL)
2	Bi-directional data (SDA)
3	Composite Sync
4	Horizontal Sync
5	Vertical Sync
6	DDC (+5VInput)
7	DDC ground
8	Chassis ground
9	Chassis ground
10	Chassis ground

Note: VPro V10 and VPro V12 support more scan rates than VPro V6 and VPro V8.