

# XZ Graphics Upgrade for Indy™ Installation Guide

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# Introduction

Congratulations on purchasing the XZ Graphics Upgrade for the Indy™ workstation.

This guide explains how to install the necessary hardware for the Indy XZ Graphics Upgrade in the Indy workstation.

Read this guide once all the way through before you start to work. Then you'll be familiar with the Indy system and the parts you'll be working with. If you find a term you haven't seen before, refer to your system owner's guide. The glossary in the owner's guide contains definitions of many of the terms used in this manual.





## Preparing the Indy Workstation

Before installing the XZ Graphics Upgrade, you must prepare your Indy workstation.

Preparing the workstation consists of:

- shutting down the system and checking the version of the PROM chip from the Command Monitor
- removing the top cover
- removing any existing GIO option boards and the graphics board
- replacing the PROM chip on the system board (if necessary)

## **XZ Graphics Upgrade Package**

Your XZ upgrade package includes all of the following items. If anything is missing, contact your sales representative.

- Z board
- X board
- PROM chip in an antistatic bag
- Chip removal tool to remove the PROM chip
- Bag of screws
- Open-ended wrench to remove standoffs and hexnuts
- Phillips screwdriver
- Antistatic wrist strap
- *XZ Graphics Upgrade for Indy Installation Guide* (this manual)
- Compact disc (CD-ROM)

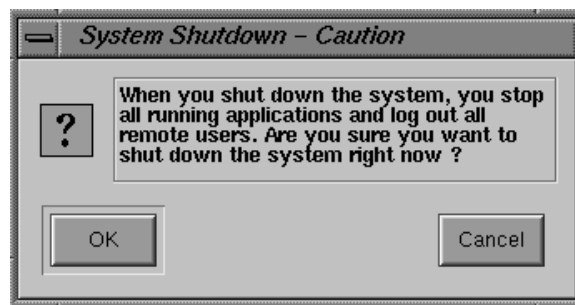
## Checking the Version of the PROM Chip

Before installing the XZ upgrade, you must check the version of your system's PROM chip to determine whether or not to replace the PROM. You do this from the Command Monitor while shutting down your system.

Follow these steps to check your system's PROM version:

1. Shut down the system.
  - Place the cursor over the word "System" in the Toolchest in the upper left corner of your screen.
  - Press and release the left or right mouse button so that you see the menu.
  - Click on "System Shutdown."

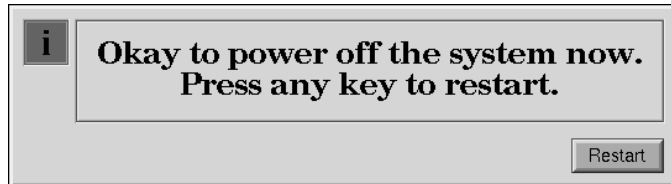
After a few seconds, you see the notifier shown in Figure 1-1.



**Figure 1-1** System Shutdown Notifier

- Click on *OK* to shut down without powering off the system.

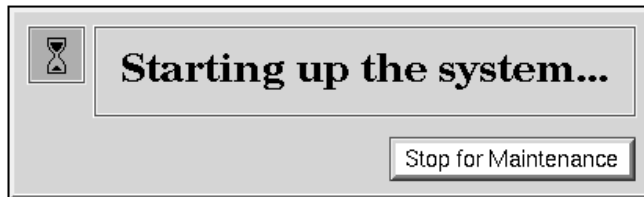
You see the message shown in Figure 1-2.



**Figure 1-2** Okay to Power Off Notifier

- Click on *Restart*.

You see the message shown in Figure 1-3.



**Figure 1-3** Starting Up the System Notifier

- Click on *Stop for Maintenance*. The System Maintenance menu appears.
2. Press **5** on the keyboard or click on the *Enter Command Monitor* icon on the System Maintenance menu.
  3. See what version of the PROM you have. At the **>>** prompt, type:

**version**

Then press **<Enter>**.

You see a line similar to this:

```
PROM Monitor SGI Version 5.0 Rev B5 IP24 Jun 20, 1994 (BE)
```

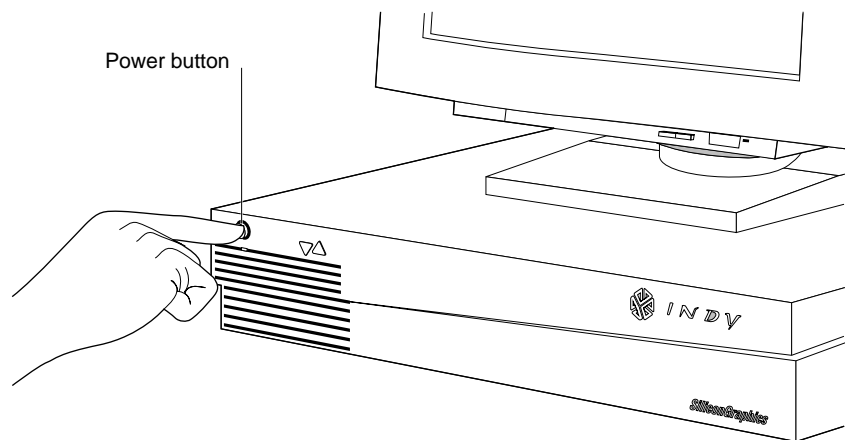
The date, "Jun 20, 1994," tells you the version of the PROM.

4. Write the date of the PROM chip here:
  - If your PROM is dated June 20, 1994 or later, you do not need to replace the PROM chip. When installing the upgrade, skip "Replacing the PROM Chip" on page 14, but complete all the other installation steps.
  - If your PROM is dated before June 20, 1994, you must replace the PROM chip. Complete all the hardware installation steps.
5. After you have checked your PROM version, type **exit** to exit the PROM monitor.

**Caution:** Do not try to install the software at this point. You must first install the XZ graphics boardset before installing the software.

You see the System Maintenance menu again. It is safe to turn off your Indy.

6. Turn off the power by pressing and releasing the power button on the front of the Indy, as shown in Figure 1-4. The system powers off automatically.



**Figure 1-4** Turning Off the Indy Workstation

## Removing the Top Cover

Follow these steps to remove the top cover of your Indy workstation:

**Caution:** Monitors are very heavy. Have someone help you move it.

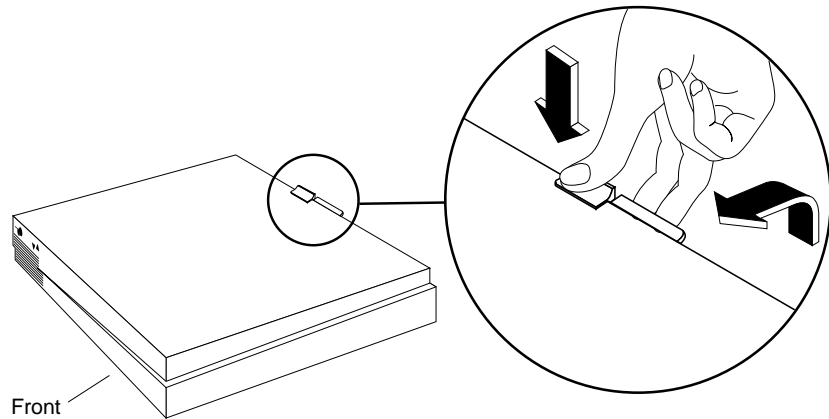
1. If the monitor is on top of the workstation, move it to one side.

**Note:** Before removing any exterior cables, familiarize yourself with their location so that you'll find it easier when reconnecting them later.

2. Disconnect the black power cable and the monitor cable from the back of the Indy workstation.

There are several other cables connected to the rear of the Indy chassis. Disconnecting them is optional, however, if you do, you'll have more room to work with when removing the screws from the back panel.

3. Facing the front of the Indy workstation, place your right thumb on the small lip at the back of the cover, and your second and third fingers under the finger ledge, as shown in Figure 1-5.
4. Snap the cover loose by bracing your thumb against the lip and pushing up the finger ledge with the second and third fingers, followed by a firm push toward the front.
5. Slide the cover forward about one inch and tilt it up to remove it.



**Figure 1-5** Removing the Top Cover From the Indy Workstation

## Attaching the Wrist Strap

Wear the wrist strap to prevent the flow of static electricity, which can damage the components in the Indy workstation.

**Caution:** The components inside the Indy are extremely sensitive to static electricity. Handle all chips and modules carefully, and wear the wrist strap shipped with the upgrade package while replacing parts inside the system.

To attach the wrist strap, follow these steps:

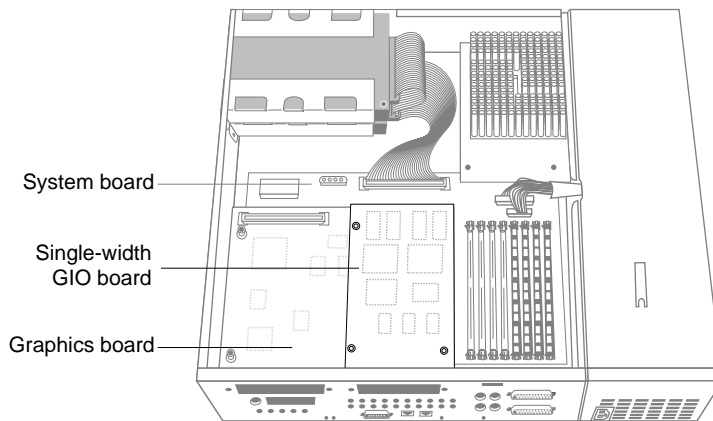
1. Put the wrist strap over your wrist, making sure it is tight against your arm.
2. Attach the alligator clip to a metal part of the Indy chassis.

## Removing the GIO Option Board

To replace the PROM chip or to install the XZ graphics boardset, you must first remove any GIO option boards (if installed) and the graphics board. The XZ boardset uses the slots that would otherwise be available for other GIO option boards.

GIO option boards are located on top of the graphics board and can be single-width, covering half of the graphics board, or double-width, covering the entire graphics board. Figure 1-6 shows a single-width board. If there's a GIO board installed, your system will have three levels of boards: the system board on the bottom, the graphics board in the middle, and the GIO board on top.

To determine if you have a GIO option board installed, look at your system and at Figure 1-6. Then follow the instructions below.



**Figure 1-6** Single-Width GIO Board

---

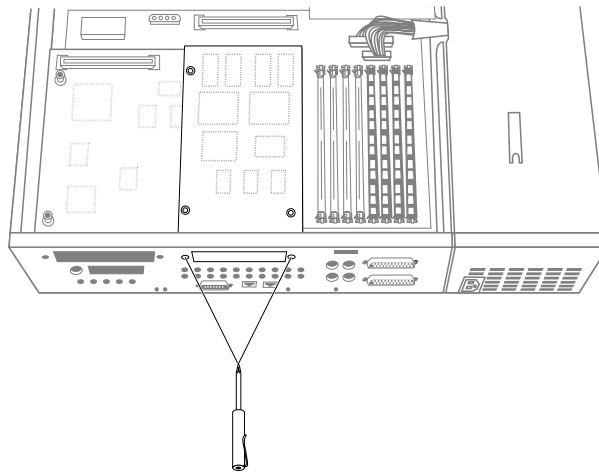
| <b>If your Indy workstation has:</b>    | <b>Then:</b>                                    |
|---|---|
| One or more GIO option boards installed | Continue with these instructions.               |
| No GIO option board installed           | Go to "Removing the Graphics Board" on page 11. |

---



**Note:** These instructions are for a single-width GIO option board. Use the same steps to remove a double-width GIO option board. The only difference is that there are more screws to remove on a double-width board.

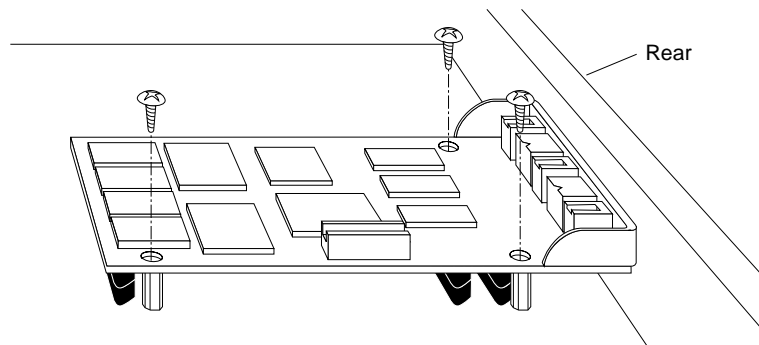
1. If there are external cables connected to the GIO option board's I/O connector on the rear of the workstation, disconnect them.
2. Using the Phillips screwdriver provided with this upgrade kit, remove the two screws from the GIO board connector on the rear of the workstation, as shown in Figure 1-7.



**Figure 1-7** Removing the Screws From the Rear Panel

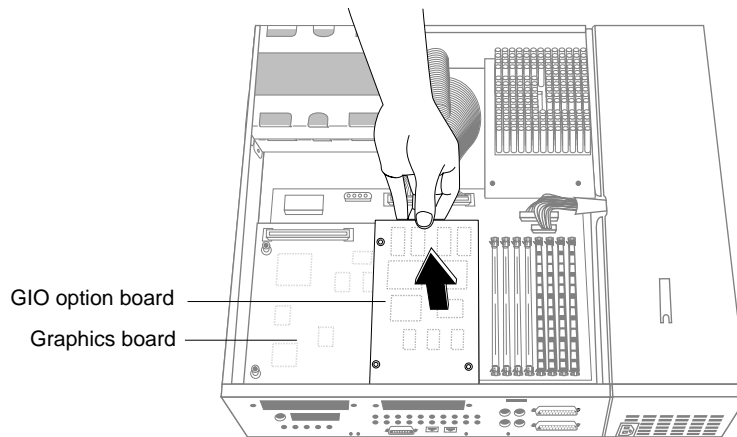
- Using a Phillips screwdriver, remove the three screws that connect the GIO option board to the graphics board, as shown in Figure 1-8.

**Note:** A double-width GIO option board has four screws to remove.



**Figure 1-8** Removing the Screws From the GIO Option Board

- Disconnect the GIO board from the graphics board by grasping the GIO board firmly and pulling it up, as shown in Figure 1-9.



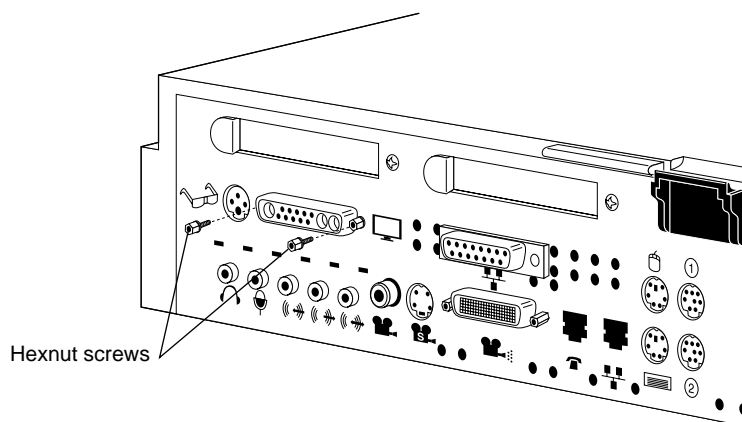
**Figure 1-9** Disconnecting the GIO Option Board

You are now ready to remove the graphics board.

## Removing the Graphics Board

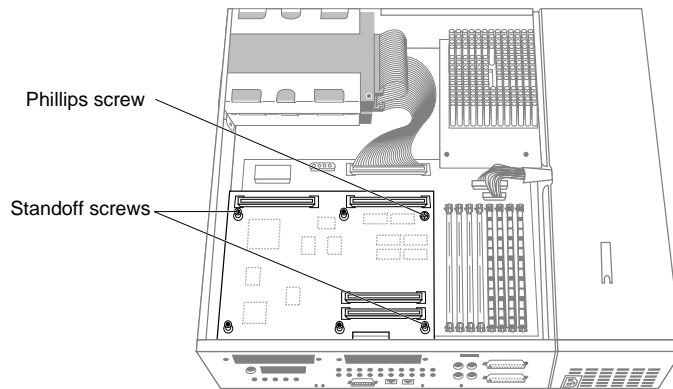
To replace the PROM chip or to install the XZ graphics boardset, you must remove the graphics board. Follow these steps to remove the graphics board:

1. Use the open-ended wrench to unscrew the two hexnut screws on either side of the graphics board's I/O connector located on the rear of the workstation. (See Figure 1-10.) The wrench is provided with this kit.



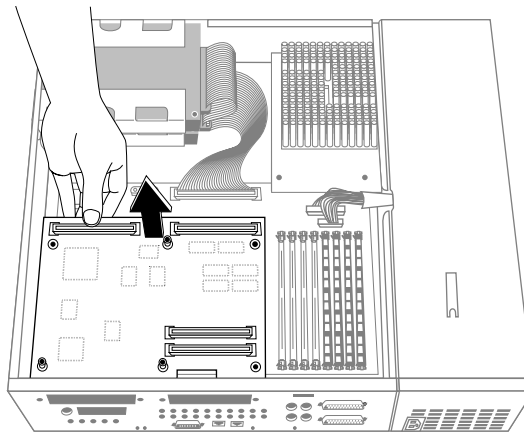
**Figure 1-10** Removing the Hexnut Screws From the Rear Panel

2. Remove the following screws from the graphics board:
  - Use the open-ended wrench to unscrew the two standoff screws (tall, hexagonal posts) from the graphics board. (See Figure 1-11.)
  - Use the Phillips screwdriver to remove one screw from the graphics board.



**Figure 1-11** Removing the Screws From the Graphics Board

3. Disconnect the graphics board from the system board, as shown in Figure 1-12.
  - Grasp the board firmly on the side close to the system disk drive.
  - Pull up to disconnect the two connectors under the board from the sockets on the system board.
  - Lift up the graphics board and remove it.



**Figure 1-12** Disconnecting the Graphics Board

You are now ready to replace the PROM chip or to install the XZ graphics upgrade. Follow the instructions in the table below.

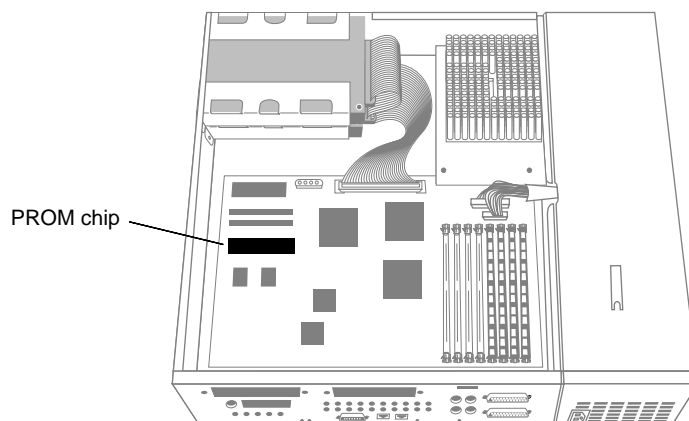
| <b>If:</b>                          | <b>Then:</b>  |
|-------------------------------------|---|
| You are replacing the PROM chip     | Go to "Replacing the PROM Chip" on page 14.             |
| You are not replacing the PROM chip | Go to Chapter 2, "Installing the XZ Graphics Boardset." |

## Replacing the PROM Chip

If your PROM chip is dated before June 20, 1994, follow the steps below to replace it. (You should have already checked the version of your PROM chip before shutting down and opening up the system. See “Checking the Version of the PROM Chip” on page 3.)

Follow these steps to remove and replace the PROM chip.

1. Locate the PROM chip on the system board, as shown in Figure 1-13.



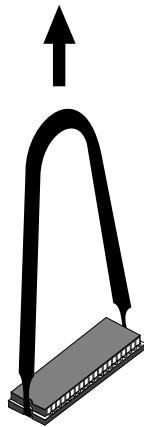
**Figure 1-13** Locating the PROM Chip on the System Board

Before removing the PROM chip, familiarize yourself with it. Note that it has either a semi-circular notch or a small, indented circle at one end. You’ll use this notch or circle to orient the upgrade PROM when you install it.

2. Remove the PROM chip from the system board.

The PROM chip is seated in a socket that is permanently attached to the system board. You remove the chip with a chip removal tool, included in this package. The tool looks like a pair of huge tweezers. When you use the tool, be sure that you insert it under the PROM chip itself, and not under the socket.

- Insert the chip removal tool between the PROM chip and the socket on the board, as shown in Figure 1-14. Work the chip away from the socket in a rocking motion, pulling up on one side of the chip and then on the other side. It may be difficult to loosen.
- Continue the rocking motion until the PROM chip is all the way out of the socket.



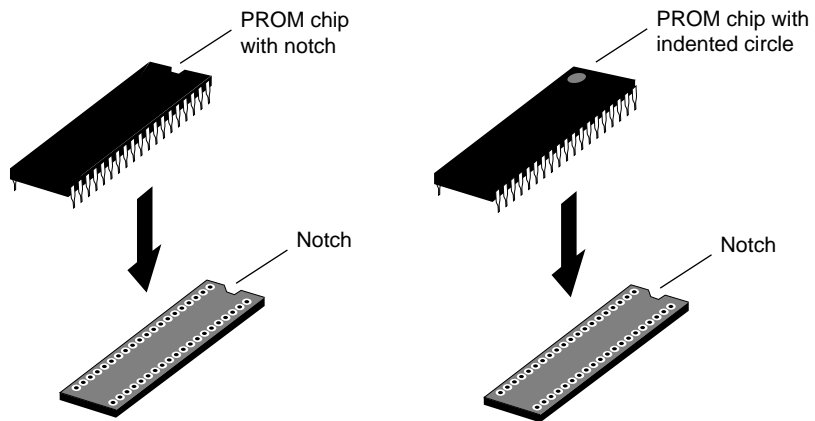
**Figure 1-14** Removing the PROM Chip

3. Install the new PROM chip.

- Grasp the new PROM chip. Orient the PROM above the socket on the system board so the end with the semicircular notch or small, indented circle on the PROM chip lines up with the notch in the socket. (See Figure 1-15.)

**Caution:** Make sure you line up the notch or the small circle on the PROM chip with the notch in the socket. If you install the PROM chip backwards, the system will not power on and you will damage the PROM chip.

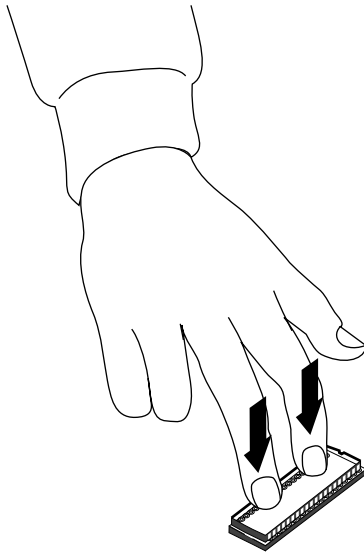
- Line up all of the pins on the PROM with the corresponding holes in the socket.



**Figure 1-15** Lining Up the PROM Chip



4. Once the pins are lined up, press down firmly on the top of the PROM chip until it is seated in the socket, as shown in Figure 1-16.



**Figure 1-16** Pressing the PROM Chip into the Socket

5. Visually check to make sure all the pins on the PROM are inserted correctly in the holes on the socket, and that the PROM is seated all the way.

You are now finished preparing the Indy workstation and are ready to install the XZ graphics boardset.



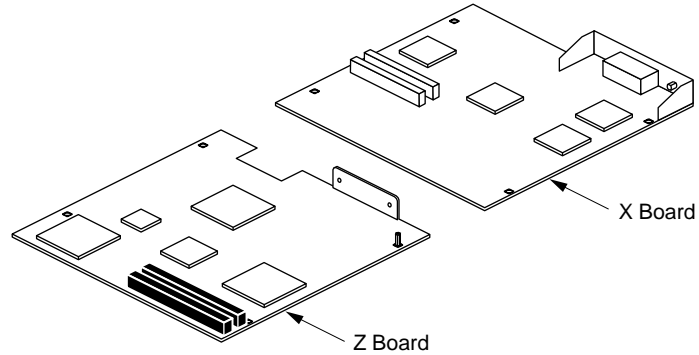
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## Installing the XZ Graphics Boardset

This chapter describes how to install the XZ graphics upgrade, replace the cover, and verify that the Indy system recognizes the upgrade.

If you have not already prepared your system as described in Chapter 1, do so now. Then return to this chapter.

The XZ graphics upgrade consists of two boards, the Z board and the X board, as shown in Figure 2-1. You install the Z board on the Indy system board first, and then install the X board on top of the Z board. Follow the instructions below.



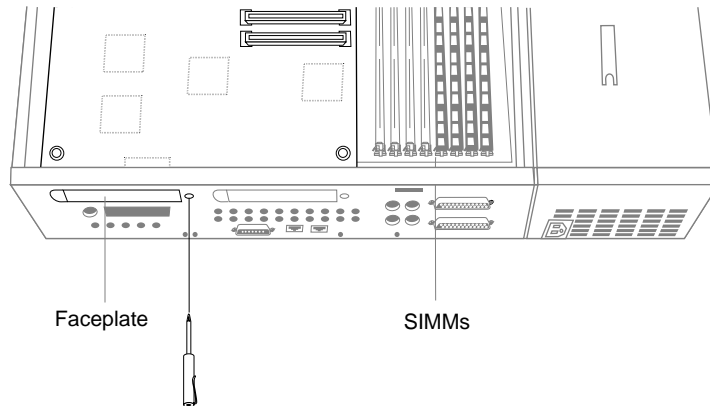
**Figure 2-1** The Z Board and the X Board

## Installing the Z Board

Follow these steps to install the Z board.

1. Identify the Z board. It is the one with a small, round I/O connector on the back panel, and a rectangular cutout at the rear of the board. (See Figure 2-1.)
2. If you have not already done so, attach the wrist strap to prevent the flow of static electricity.
  - Put the wrist strap over your wrist, making sure it is tight against your arm.
  - Attach the alligator clip to a metal part of the Indy chassis, close to where you are working.
3. Check if there is a faceplate covering the GIO option port farthest from the SIMMs, as shown in Figure 2-2.
4. If there is a faceplate covering the port, use a Phillips screwdriver to remove the screw and washer.

Save the faceplate. If you remove the XZ graphics boardset in the future and do not replace it, you should reinstall the faceplate.

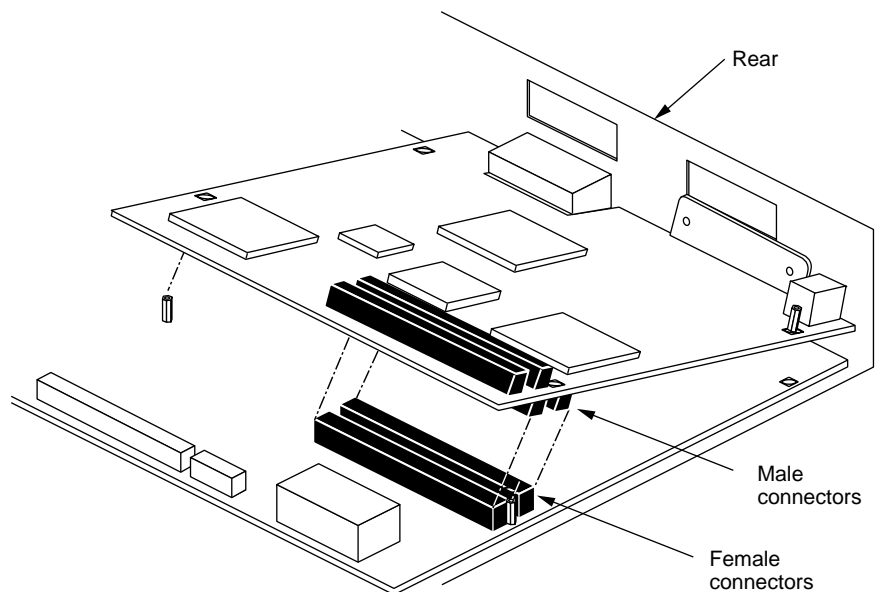


**Figure 2-2** Removing the Faceplate From the GIO Option Port

5. Position the Z board over the system board.
  - Grasp the Z board by the sides, with the two 96-pin male connectors on the underside, as shown in Figure 2-3.
  - Loosely place the Z board on top of the system board so that the two male connectors on the underside of the Z board align with the two female connectors on the system board, as shown in Figure 2-3.

**Caution:** The pins in the male connectors are delicate. Gently wiggle or reposition the Z board to fit the pins of the male connectors into their slots in the female connectors. Do not apply any pressure until the pins fit properly.

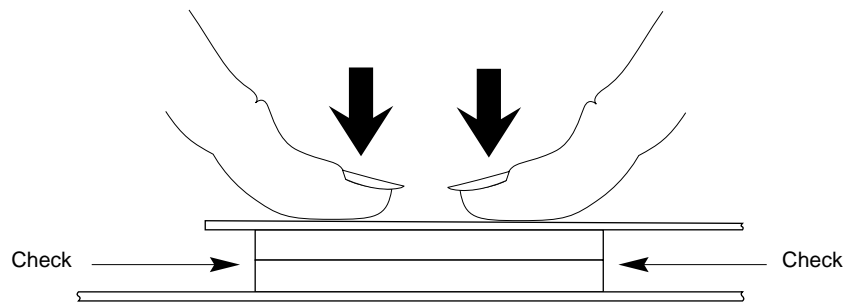
  - Check that each screw hole on the Z board is sitting directly above a matching standoff (tall, hexagonal post) on the system board.



**Figure 2-3** Positioning the Z Board Over the System Board

6. Press to seat the Z board's connectors into the system board's connectors, as shown in Figure 2-4.
  - Place your fingers or thumbs on the Z board above where the connectors are located.
  - Press down gently but firmly until the two connectors fit snugly.

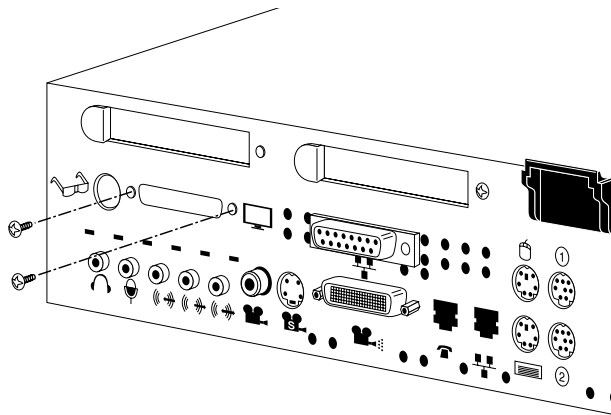
**Caution:** Do not press hard enough to bend the system board.



**Figure 2-4** Seating the Z Board's Connectors

7. Verify that the Z board is properly seated.
  - Look underneath the Z board to see the two 96-pin connectors. Due to the other components on the board, it may be difficult to see the connectors. The male and female connectors must be touching along the entire shared surface, as shown in Figure 2-4. Be sure to check each end of the connector.

8. Insert two screws through the rear of the workstation, as shown in Figure 2-5.
  - Remove two Phillips screws from the plastic bag that comes with this package.
  - Insert and tighten the screws, using the Phillips screwdriver.If the screw holes are not aligned, press the board lightly until the screwholes are aligned.



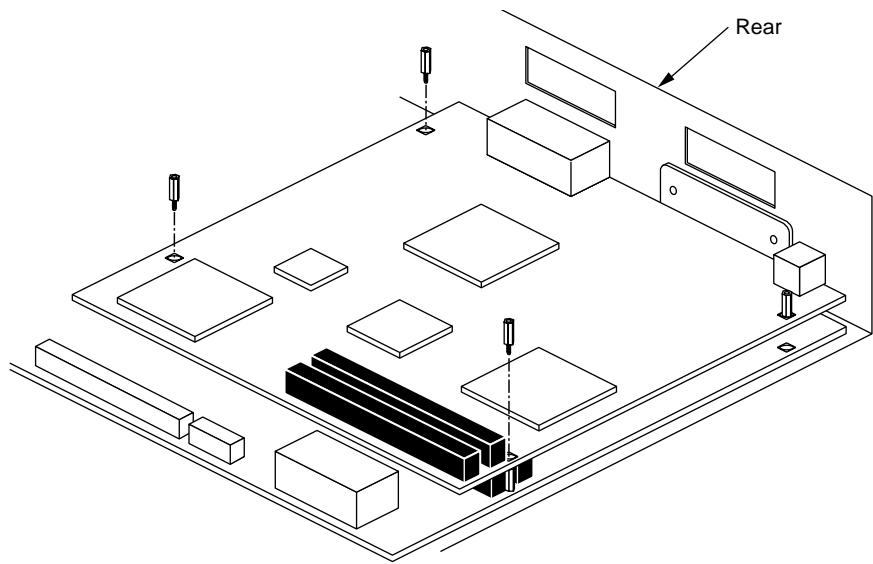
**Figure 2-5** Securing the Z Board to the Rear of the Workstation

9. Secure the Z board with three standoff screws. Standoff screws are tall, hexagonal posts, as shown in Figure 2-6.

- Remove three standoff screws from the plastic bag that comes with this package.
- Using the open-ended wrench, insert and tighten the three standoff screws in the locations shown in Figure 2-7. As you tighten the screws, alternate among them so that the board is fastened evenly.



**Figure 2-6**  
Standoff Screw



**Figure 2-7** Inserting the Standoff Screws on the Z Board

You are now ready to install the X board.



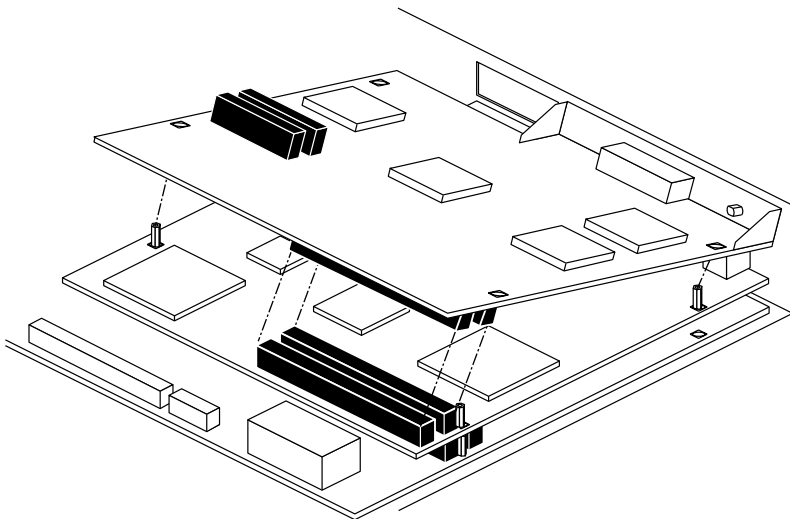
## Installing the X Board

Now you install the X board on top of the Z board. Follow these steps to install the X board.

1. Position the X board over the Z board.
  - Grasp the X board by the sides, with the two 96-pin male connectors on the underside, as shown in Figure 2-8.
  - Lower the X board over the Z board, inserting the board's external I/O connector through the open slot on the rear of the workstation.
  - Loosely place the X board on top of the Z board so that the two male connectors on the underside of the X board align with the two female connectors on the Z board, as shown in Figure 2-8.

**Caution:** The pins in the male connectors are delicate. Gently wiggle or reposition the X board to fit the pins of the male connectors into their slots in the female connectors. Do not apply any pressure until the pins fit properly.

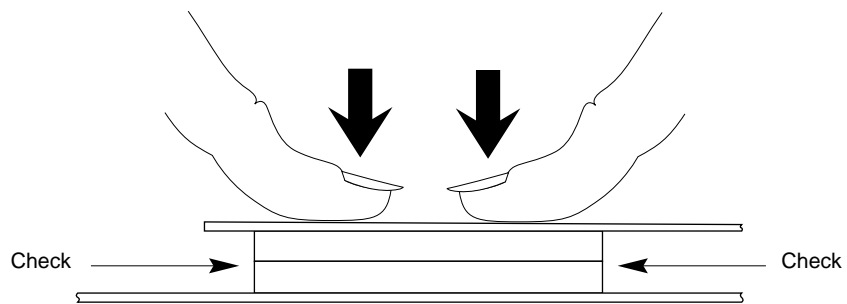
  - Check that each screw hole on the X board is sitting directly above a matching standoff (tall, hexagonal post) on the Z board.



**Figure 2-8** Positioning the X Board Over the Z Board

2. Press to seat the X board's connectors into the Z board's connectors, as shown in Figure 2-9.
  - Place your fingers or thumbs on the X board above where the connectors are located.
  - Press down gently but firmly until the two connectors fit snugly.

**Caution:** Do not press hard enough to bend the lower two boards.

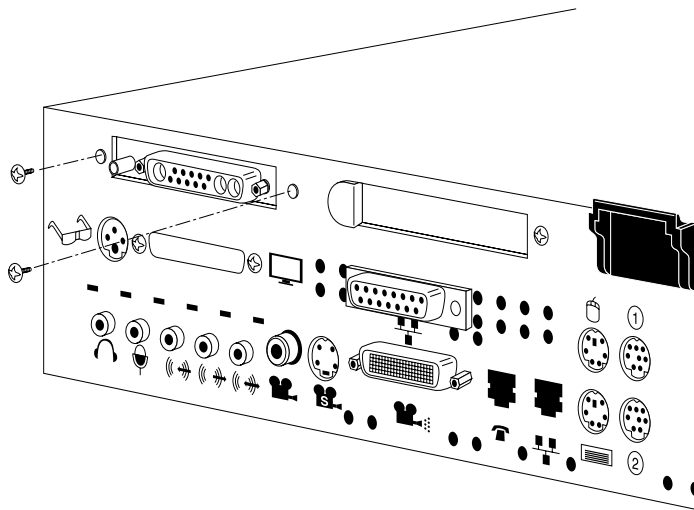


**Figure 2-9** Seating the X Board's Connectors

3. Verify that the X board is properly seated.
  - Look underneath the X board to see the 96-pin connectors. Due to the other components on the board, it may be difficult to see the connectors. The male and female connectors must be touching along the entire shared surface, as shown in Figure 2-9. Be sure to check each end of the connector.

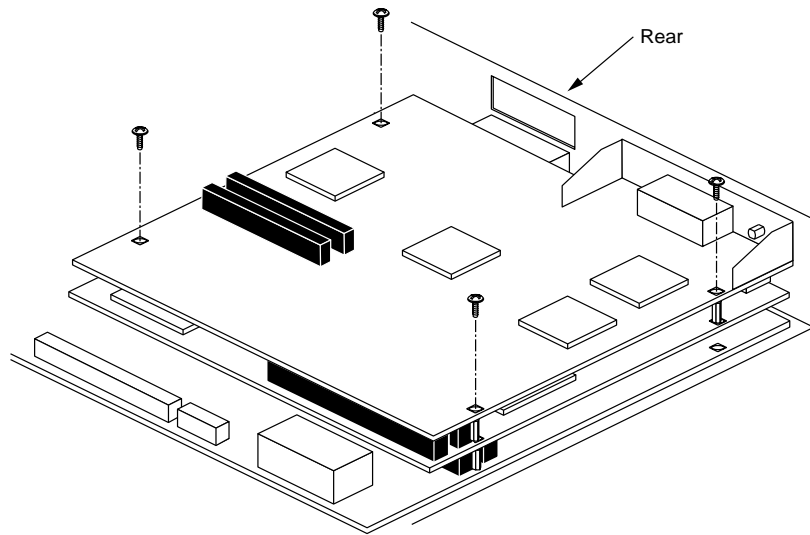
4. Secure the X board to the rear of the workstation.
  - Remove two Phillips screws from the plastic bag that comes with this package.
  - Before attaching the screws to the rear of the workstation, check that the screwholes on *top* of the board are lined up directly above a matching standoff screw on the board below. (See Figure 2-11.)
  - Using the Phillips screwdriver, insert and tighten the two Phillips screws in the locations shown in Figure 2-10.

If the screw holes do not line up, the board may not be seated all the way.



**Figure 2-10** Securing the X Board to the Rear of the Workstation

5. Secure the X board to the Z board as follows.
  - Remove four Phillips screws from the plastic bag that comes with this package.
  - Using the Phillips screwdriver, insert and tighten the four screws in the locations shown in Figure 2-11. As you tighten the screws, alternate among them so that the board is fastened evenly.



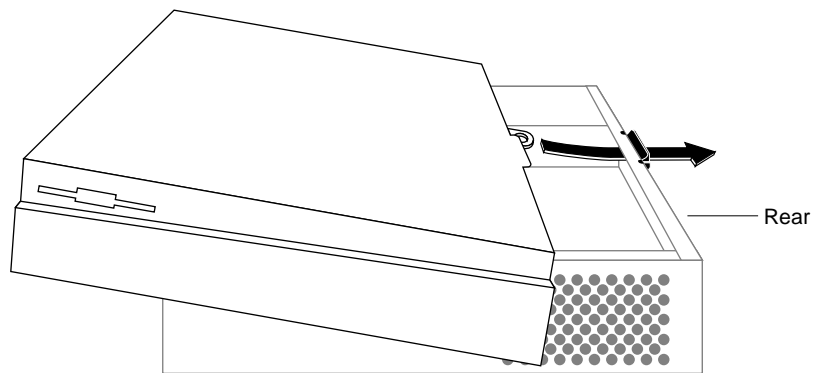
**Figure 2-11** Inserting the Screws on the X Board

You are finished installing the XZ graphics upgrade, and are ready to replace the top cover and connect the exterior cables.

## Replacing the Top Cover and Connecting the Cables

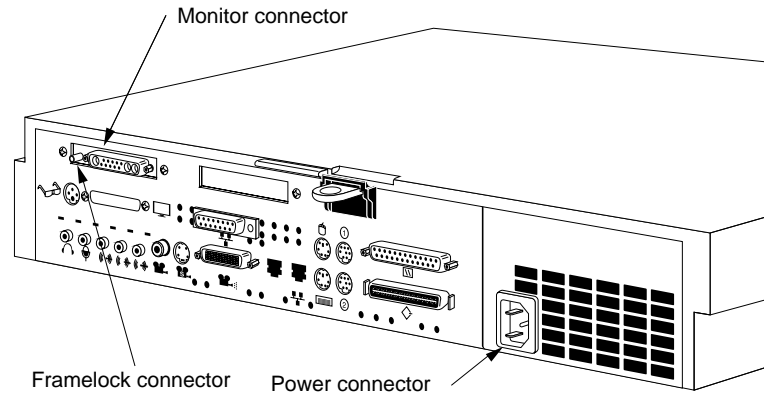
To replace the cover of your Indy workstation, follow these steps:

1. Facing the front of the system, lower the cover a few inches from its fully closed position, as shown in Figure 2-12.
2. Tilt the cover and insert the tab through the slot in the rear of the chassis.
3. Lower the cover and slide it toward the back of the chassis until it snaps into place.



**Figure 2-12** Replacing the Top Cover on the Indy Workstation

4. Connect the power cable, monitor cable, and any other cables you removed earlier, as shown in Figure 2-13.



**Figure 2-13** Connecting the Exterior Cables to the Indy Workstation

### About the Framelock Connector

The Framelock feature synchronizes the vertical refresh rate of the Indy workstation's monitor to an external source such as a camera, video cassette recorder, another monitor, and so on.

To use this feature, connect a composite video signal or a composite sync signal from an external source to the Framelock connector. A mini-BNC adapter cable (Part Number 7160833) is available free of charge from Silicon Graphics. Contact your local sales office for more information on obtaining the cable.

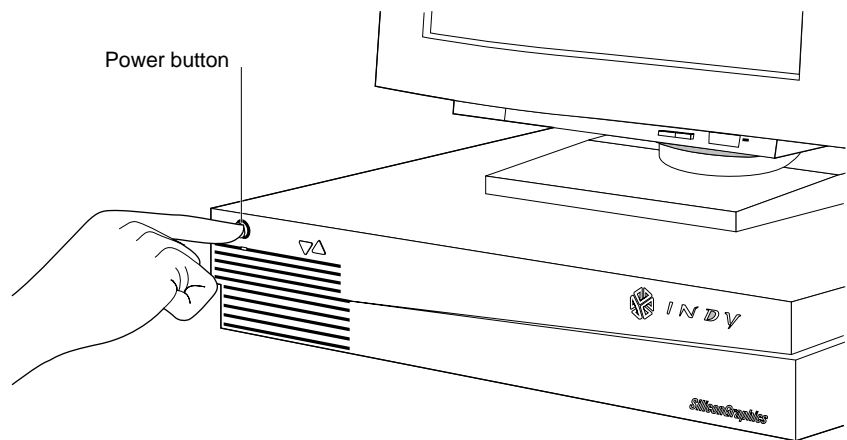
For more information on using the Framelock feature, from a shell window, type `man setmon`.

You are finished installing the hardware and are ready to verify the hardware installation.

## Verifying the XZ Graphics Hardware Installation

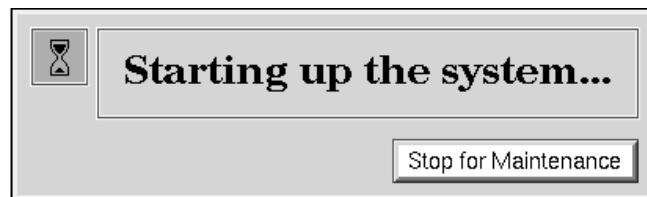
Before installing the software for the XZ graphics upgrade, you should verify that you've installed the hardware correctly. You can do this from the Command Monitor while powering up your system. Follow these steps:

1. Press and release the power button on the front of your Indy workstation, as shown in Figure 2-14.



**Figure 2-14** Turning on the Indy Workstation

2. When you see the following message, click on *Stop for Maintenance*.



**Figure 2-15** Starting Up the System Notifier

The System Maintenance menu appears.

3. Press **5** on the keyboard, or click on the *Enter Command Monitor* icon on the System Maintenance menu.

If the System Maintenance menu is not displayed, the XZ graphics upgrade is not installed correctly. Power down the system, remove the top cover, and check that both the Z board and the X board are seated correctly. Read the instructions again in “Installing the Z Board” on page 20 and “Installing the X Board” on page 25 again to make sure you completed all the steps. Then try this procedure again.

4. At the >> prompt, type:

```
hinv
```

Then press <Enter>.

If you have installed the graphics upgrade correctly, you see the following line:

```
Graphics: GR3-XZ
```

5. Press **2** on the keyboard, or click on the *Install System Software* icon on the System Maintenance menu.

You are now ready to install the software.

## Installing the Software

The XZ graphics upgrade requires IRIX 5.2 for Indy Presenter, Indy XZ, and R4600SC133. Follow the instructions in the software release notes on the CD to install the software.

Note that the XZ graphics boardset must be installed before you install the software.

If you swap between the XZ graphics upgrade and the Indy graphics board, you must reinstall the system software each time so that the correct graphics board is recognized. When you install the software, you may get a message to the effect that there is no new software to install. You need to force the installation by typing the following at the *inst* menu:

```
install eoe1.sw.unix eoe1.sw.gfx_lib x_eoe.sw.Server
```



## Verifying the XZ Graphics Software Installation

Follow these steps to check if the system recognizes the new boardset:

1. Press and release the power button to turn on the power.
2. After the power-on diagnostics run, the system boots up and brings you to the login screen.
3. Log in to your account.
4. Check that the board you installed is shown correctly.
  - Choose “System Manager” from the System toolchest.  
You see a window showing Hardware Resources.
  - Look under “Hardware” for a line showing “XZ.”

You are now finished installing the XZ graphics boardset.

## Returning the Original Graphics Board

If you have no further use for your original graphics board, you can use the box that contained the XZ Graphics Upgrade to return it to Silicon Graphics.

1. Place the board in the antistatic bag that shipped with the upgrade, and pack the equipment in the box.
2. Use the Return Materials Authorization form to return the equipment to Silicon Graphics.

## Product Support

When you purchased your system you may have purchased a support program from either Silicon Graphics, Inc., or a vendor who supplies software. Whenever you encounter any problems that you cannot solve using the methods in this chapter, contact the organization from which you purchased the support program.

If you would like support for your Silicon Graphics products, contact your service provider.



## Regulatory Information

The following section provides regulatory information for the Indy workstation with XZ graphics.

### Manufacturer's Regulatory Declarations

#### Electromagnetic Emissions

This device complies with the Class A limits of Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment does not exceed the Class A limits of Canada's Department of Communications Radio Interference Regulations for radio noise emissions.

This device complies with Class A electromagnetic emissions limits of C.I.S.P.R. Publication 22, Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment, Germany's BZT Class A limits for Information Technology Equipment, and with Japan's VCCI Class 1 limits.

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取扱説明書に従って正しい取り扱いをして下さい。

**Figure 3-1** Japanese VCCI Class 1 Statement

## Radio and Television Interference

The equipment described in this guide generates and uses radio frequency energy. If it is not installed and used in accordance with the instructions in this guide, it can cause radio and television interference.

This equipment has been tested and complies with the limits for a Class A computing device in accordance with the specifications in Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in an industrial or office installation. However, there is no guarantee that the interference will not occur in a particular installation. This system is not certified for home use.

You can determine whether your system is causing interference by turning it off. If the interference stops, it was probably caused by the workstation or one of the peripherals. To tell if the interference is caused by one of the peripherals, try disconnecting one peripheral at a time to see if the interference stops. If it does, that peripheral is the cause of the interference.

If your workstation does cause interference to radio or television reception, try to correct the interference by using one or more of the following suggestions:

- Turn the television or radio antenna until the interference stops.
- Move the workstation to one side or the other of the radio or television.
- Move the system farther away from the radio or television.
- Plug the system into an outlet that is on a different circuit from the radio or television. (That is, make certain the workstation and the radio or television are on circuits controlled by different circuit breakers or fuses.)

### **Electrostatic Discharge**

Silicon Graphics designs and tests its products to be immune to effects of electrostatic discharge (ESD). ESD is a source of electromagnetic interference and can cause problems ranging from data errors and lockups to permanent component damage.

It is important that while you are operating your Indy you keep all the covers and doors, including the plastics, in place. The shielded cables that came with the system and its peripherals should be installed correctly, with all thumbscrews fastened securely.

An ESD wrist strap is included with some products, such as memory and graphics upgrades. The wrist strap is used when installing these upgrades to prevent the flow of static electricity, and it should protect your system from ESD damage.

### **Shielded Cables**

The Indy workstation is FCC-compliant under test conditions that include the use of shielded cables between Indy and its peripherals. Your Indy and any peripherals you purchase from Silicon Graphics have shielded cables. Shielded cables reduce the possibility of interference with radio, television, and other devices. If you use any cables that are not from Silicon Graphics, make sure they are shielded. Telephone cables do not need to be shielded.

The monitor cable supplied with your system uses additional filtering molded into the cable jacket to reduce radio frequency interference. Always use the cable supplied with your system. If your monitor cable becomes damaged, a replacement cable should be obtained from Silicon Graphics.

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