

# Indigo<sup>2</sup><sup>TM</sup> and POWER Indigo<sup>2</sup><sup>TM</sup> Presenter Owner's Guide

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# Introduction

Congratulations on purchasing the Presenter, the world's first 1024 x 768 full-color, flat-panel monitor with stereo speakers and overhead projection capability.

This guide explains how to install the necessary hardware for the Presenter in the Indigo<sup>2</sup><sup>™</sup> and POWER Indigo<sup>2</sup><sup>™</sup> workstations, how to set up the Presenter as a monitor for your workstation, and how to use it on the Silicon Graphics<sup>®</sup> customized Dukane<sup>®</sup> overhead projector.

In this manual "Indigo<sup>2</sup>" and "POWER Indigo<sup>2</sup>" are the terms used for the R4X00 series and R8000 processor workstations respectively.

You will also learn how to use the Presenter software, how to transport and take care of the Presenter, and how to troubleshoot if you have problems.

Read this guide once all the way through before you start to work. Then you'll be familiar with the Indigo<sup>2</sup> 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.



## Installing the Presenter Hardware

Before using the Presenter, you need to prepare your Indigo<sup>2</sup> or POWER Indigo<sup>2</sup> workstation by installing some hardware and software.

**Note:** You cannot install the Presenter adapter board in an Indigo<sup>2</sup> with a Galileo video board, because they occupy the same slot. Note also that the Presenter is not supported on an Indigo<sup>2</sup> with XL graphics.

To install the hardware, you will complete these steps:

- Identify which graphics board is installed in your Indigo<sup>2</sup> workstation.
- Identify which processor is installed in your workstation.
- Shut down the system and check the version of your PROM chip from the Command Monitor.
- Remove the cover.
- Remove the graphics board set.
- Remove and replace the PROM chip on the system board (if necessary).
- Install the Indigo<sup>2</sup> Presenter adapter board on the graphics board set.
- Replace the graphics board set.
- Replace the cover.
- Connect the cables and restart your system.

### The Indigo<sup>2</sup> Presenter Packages

Your Indigo<sup>2</sup> Presenter packages include the following items. If anything is missing, contact your sales representative.

- Presenter flat-panel monitor (Don't be concerned that the name on the Presenter is "Indy Presenter." By installing the Indigo<sup>2</sup> Presenter adapter board, the Indy Presenter works on Indigo<sup>2</sup> and POWER Indigo<sup>2</sup> workstations.)
- Power cable and interface cable
- Cleaning kit
- Indigo<sup>2</sup> Presenter adapter board in an antistatic bag
- Bag of gold and silver colored standoffs (short hexagonal posts) for installing the adapter board
- A package containing PROM chips and CDs for the Indigo<sup>2</sup> (R4X00) workstations (you will install only one PROM chip—the rest are spares)
- A package containing PROM chips and a CD for the POWER Indigo<sup>2</sup> (R8000<sup>TM</sup>) workstations (you will install only one PROM chip—the rest are spares)
- Black audio cable
- A removal tool to remove the PROM chip
- Hex nut driver to remove hexnuts
- Open-ended wrench to attach standoffs
- Reversible Phillips/flat screwdriver
- Antistatic wrist strap
- *Indigo<sup>2</sup> and POWER Indigo<sup>2</sup> Presenter Owner's Guide* (this manual)

## Identifying Your Graphics Board and Processor Type

To install the hardware for the Presenter, you need to know what graphics board and what processor are installed in your system. To determine this:

1. Turn on your Indigo<sup>2</sup> workstation, and log in.
2. From the desktop toolchest, select "Unix Shell."
3. At the shell prompt, type:

```
hinv
```

4. Look for the line showing your graphics board type. It should say either: "Graphics board: GR3-XZ," "Graphics board: GR3-Elan," or "Graphics board: GU1-Extreme." In this manual the term "XZ" is used to describe the GR3-XZ graphics board set, "XZ+" is used for the GR3-Elan board set, and "Extreme" is used for the GU1-Extreme board set. You might want to write down your graphics board type.
5. Look for the line showing your processor type.
  - If you see "CPU:MIPS R4000," "CPU:MIPS R4400," or "CPU:MIPS R4600," you have an Indigo<sup>2</sup> system.
  - If you see "CPU:MIPS R8000," you have a POWER Indigo<sup>2</sup> system.

In this manual "Indigo<sup>2</sup>" and "POWER Indigo<sup>2</sup>" are the terms used for the R4X00 series and R8000 processor workstations respectively.

You might want to write down your processor type. Later in the installation, you'll need to choose the correct PROM chip to install, depending on what processor is installed in your system.

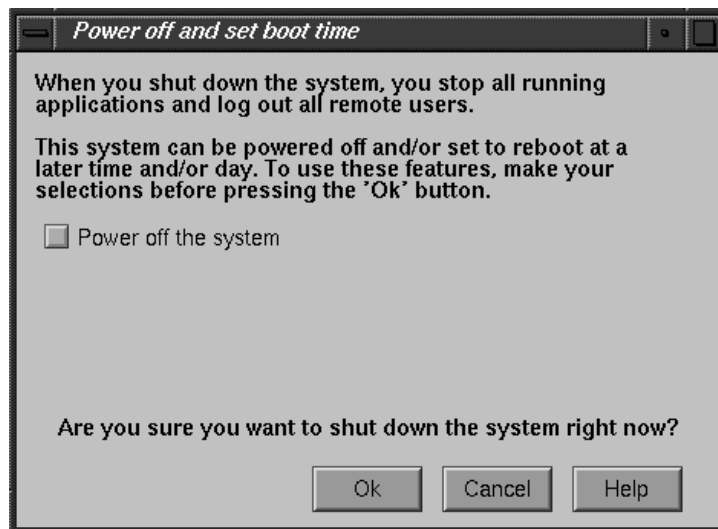
## Checking the Date of the PROM Chip

You may or may not need to replace your workstation's PROM chip, depending on the date of the PROM.

Follow these steps to check the date of your workstation's PROM while shutting down your system.

1. Shut down the system.
  - From the System toolchest, select "System Shutdown."

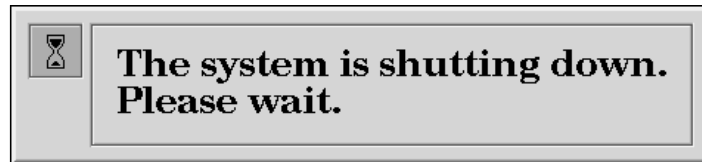
After a few seconds you see a notifier similar to the one shown in Figure 1-1.



**Figure 1-1** Power Off Notifier

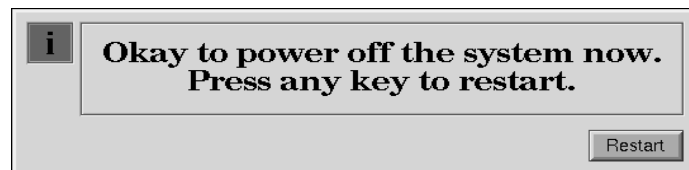
- Click *OK* to shut down without powering off the system. The screen clears and you see the notifier shown in Figure 1-2.





**Figure 1-2** System Shutdown Notifier

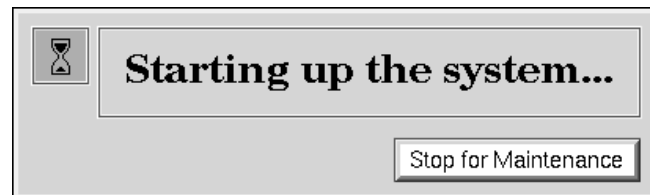
The screen clears and you see the message shown in Figure 1-3.



**Figure 1-3** Okay to Power Off Notifier

- Click the *Restart* button.

You see the message shown in Figure 1-4.



**Figure 1-4** The Starting Up the System Notifier

- Click the *Stop for Maintenance* button, or press the <Esc> key.
2. When the System Maintenance menu appears, press 5 on the keyboard, or click on the *Enter Command Monitor* icon.
  3. To check the date of your PROM, at the >> prompt, type:
    - `version`
    - and press <Enter>.

You see a line similar to this:

```
PROM Monitor SGI Version 5.3 Rev D IP22 Mar 13, 1995 (BE)
```

The date of the PROM is “Mar 13, 1995.” You might want to make a note of it.

- If your PROM is dated *before* April 12, 1995 for the Indigo<sup>2</sup>, or *before* April 24, 1995 for the POWER Indigo<sup>2</sup>, you *must replace the PROM chip*. Complete all the hardware installation steps described in this manual.
  - If your PROM is dated April 12, 1995 or later for the Indigo<sup>2</sup>, or April 24, 1995 or later for the POWER Indigo<sup>2</sup>, you do not need to replace the PROM chip. When installing the upgrade, skip the section “Removing and Replacing the PROM Chip” on page 13, but complete all the other installation steps.
4. After you have checked your PROM date, type **exit** to exit the PROM monitor.

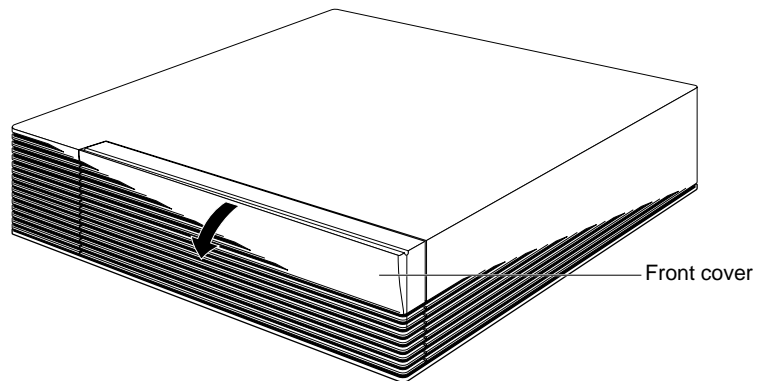
You see the System Maintenance menu again.

You have now checked the date of your PROM chip and are ready to shut down the system.

## Powering Off the System

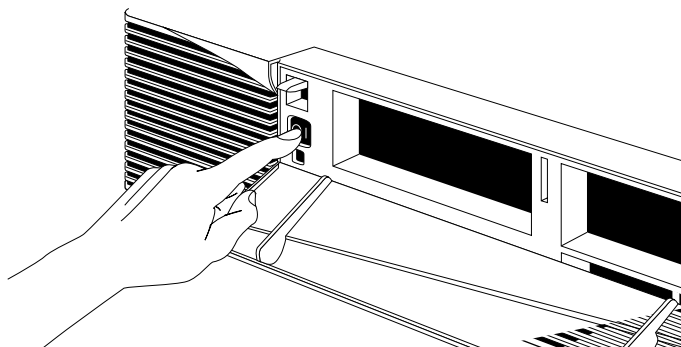
Follow these steps to power off the system.

1. Open the front cover of the chassis, as shown in Figure 1-5.
  - Face the front of the Indigo<sup>2</sup> chassis.
  - Snap the cover away from the top edge of the chassis and tip it down.



**Figure 1-5** Opening the Front Cover of the Indigo<sup>2</sup> Chassis

2. Press and release the power switch, as shown in Figure 1-6.



**Figure 1-6** Pressing and Releasing the Power Switch

The system powers off automatically within a few minutes.

## Removing the Top Cover

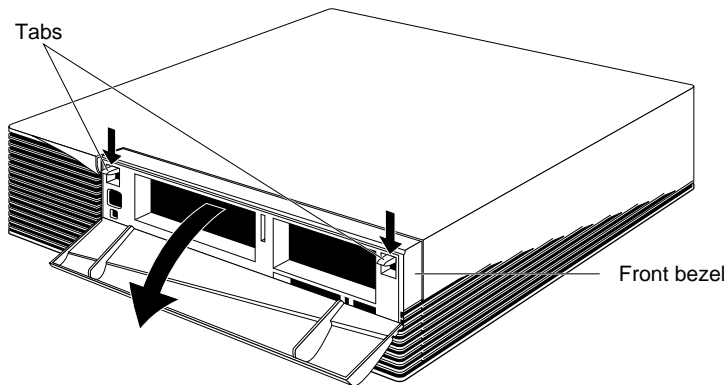
Follow the steps below to disconnect the monitor and power cables and remove the top cover.

Before removing any exterior cables, familiarize yourself with their location on the rear of the chassis so that you'll find it easier when reconnecting them later.

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

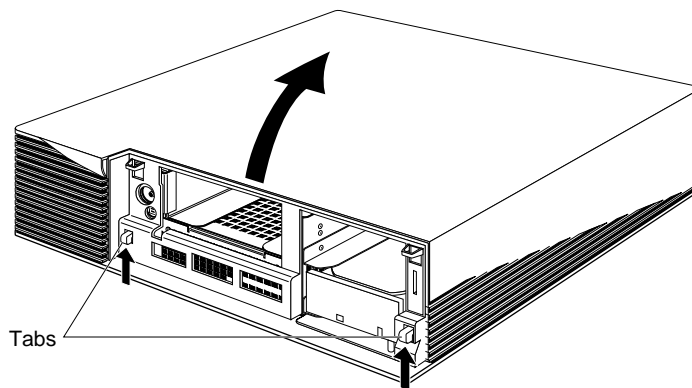
**Caution:** Your monitor is very heavy. Have someone help you move it.

2. Disconnect the monitor and power cables from the back of your Indigo<sup>2</sup> workstation.
3. Remove the front bezel.
  - Press down on the tabs on each side of the bezel, as shown in Figure 1-7.
  - Pull the bezel away from the chassis.



**Figure 1-7** Removing the Front Bezel from the Indigo<sup>2</sup> Chassis

4. Remove the top cover.
  - Press up on the tabs on each side of the drive openings.
  - Pull up on the cover and rotate it back and away from the chassis, as shown in Figure 1-8.



**Figure 1-8** Removing the Top Cover of the Indigo<sup>2</sup> Chassis

## Attaching the Wrist Strap

Wear the wrist strap to prevent the flow of static electricity, which can damage the components in the Indigo<sup>2</sup> workstation.

**Caution:** The components inside the Indigo<sup>2</sup> 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 Indigo<sup>2</sup> chassis.

You are now ready to remove the graphics board set.

## Removing the Graphics Board Set

You need to remove your graphics board set in order to:

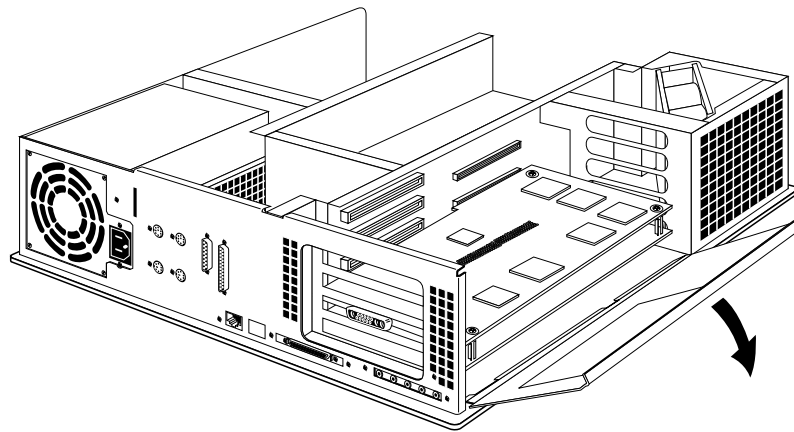
- reach the PROM chip on the system board to replace it (if necessary),
- install the Presenter adapter board on top of the graphics board set

If your system has an EISA or GIO option board installed above the graphics board, remove it before removing the graphics board. If necessary, see the documentation that came with the option board, or your system's *Owner's Guide*.

To remove the XZ, XZ<sup>+</sup>, or Extreme graphics board set, follow these steps:

**Note:** The figures in this section show an XZ or XZ<sup>+</sup> graphics board set. Follow the same instructions to remove an Extreme graphics board set.

1. Make sure the wrist strap is attached to a metal part of the system.
2. Move the system or position yourself so that you are facing the expansion slots, as shown in Figure 1-9.
3. Open the metal panel in front of the expansion slots by pulling up on the panel and lowering it.



**Figure 1-9** Lowering the Metal Panel in Front of the Expansion Slots

4. Remove the screws attaching the board to the system slots as shown in Figure 1-10. If there is a cover over the slot above the graphics board set, you need to remove the screw that holds it too.

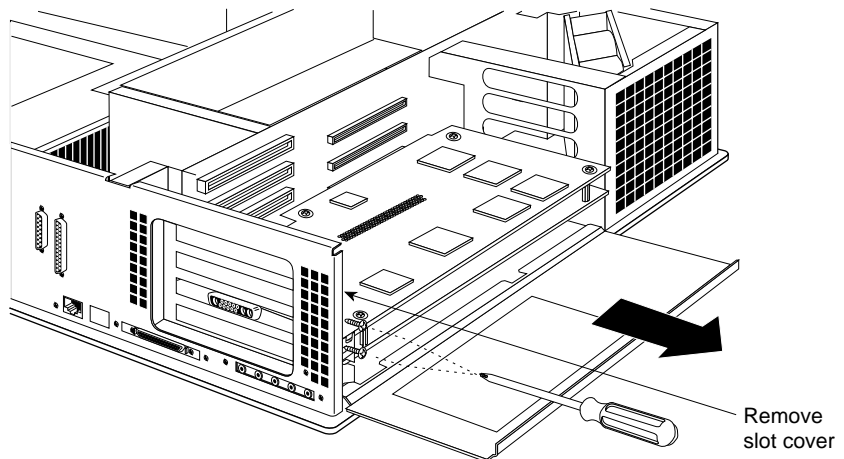
Figure 1-10 shows an XZ or XZ<sup>+</sup> graphics board set. If your system has the Extreme graphics board set, there are three screws to remove.

- Loosen each screw with the Phillips screwdriver.

**Note:** The screwdriver provided is a reversible Phillips/flat screwdriver. If the flat end is in position, pull it out and reverse it to the Phillips end.

- Unscrew each screw all the way with your hand, and remove it.

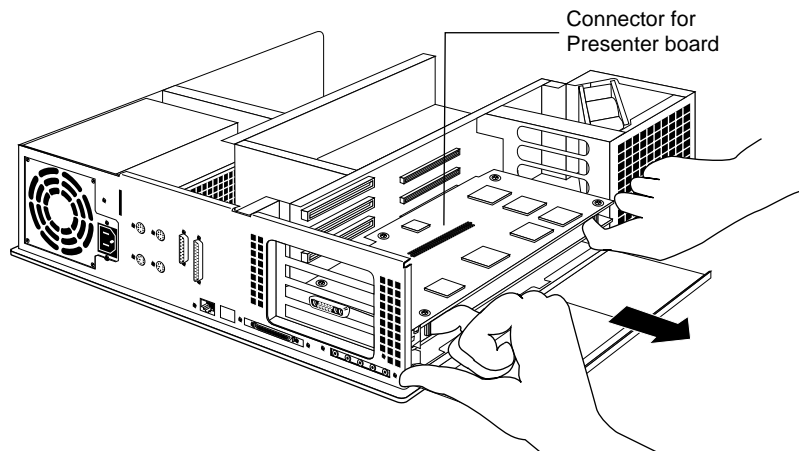
The screws are very short. If you drop a screw into the chassis, remove it to prevent the possibility of shorting the system.



**Figure 1-10** Removing the Screws From the Metal Extension

5. Prepare an antistatic surface where you will place the board set after removing it. An empty antistatic bag, or a clean, dry desktop works well.

6. Pull the board set out of the system, as shown in Figure 1-11.
  - Turn both hands inward so that your thumbs point to the floor.
  - Place your index fingers behind the small metal posts on each side of the board.
  - Brace your thumbs against the chassis, and pull the board out of the slot. You may need to use some force.



**Figure 1-11** Pulling the Graphics Board Set out of the Chassis

7. Place the board set down on the antistatic surface you have prepared. The long, male connector for the Presenter adapter should be in the middle of the top board.

You are finished removing the graphics board set. Follow the instructions below.

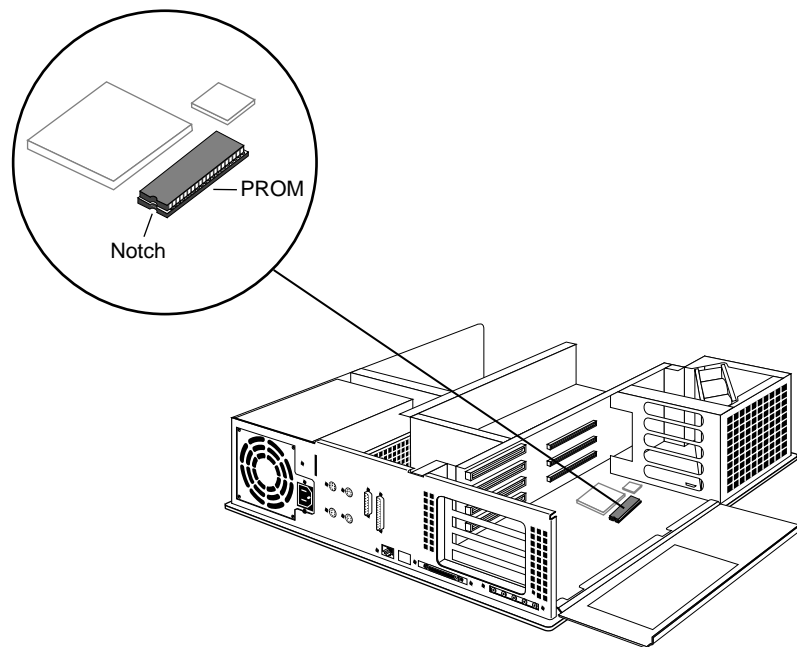
- If you determined earlier that you need to replace the PROM chip, go to “Removing and Replacing the PROM Chip” on page 13. (You should have checked the date of the PROM chip before opening up the system. See “Checking the Date of the PROM Chip” on page 4.)
- If you are not replacing the PROM, go to “Installing the Presenter Adapter Board” on page 17.



## Removing and Replacing the PROM Chip

If your PROM chip is dated *before* April 12, 1995 for the Indigo<sup>2</sup>, or *before* April 24, 1995 for the POWER Indigo<sup>2</sup>, follow the steps below to remove and replace it. (You should have already checked the version of your PROM chip before shutting down and opening up the system. See “Checking the Date of the PROM Chip” on page 1-4.)

1. Locate the PROM chip. The PROM chip is located in a socket on the system board, below the slot from which you removed the graphics board, as shown in Figure 1-12.



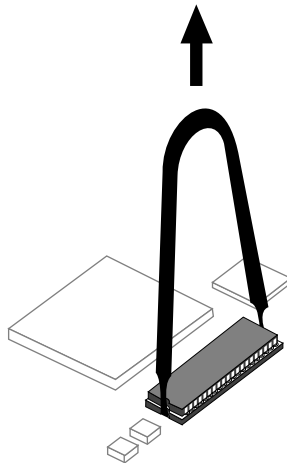
**Figure 1-12** Locating the PROM Chip on the System Board

2. Before removing the PROM chip, familiarize yourself with it. Note that it has a semicircular notch at one end, as shown in Figure 1-12. You'll use this notch to orient the new PROM when you install it.

3. 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 PROM 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 to 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 1-13. 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.



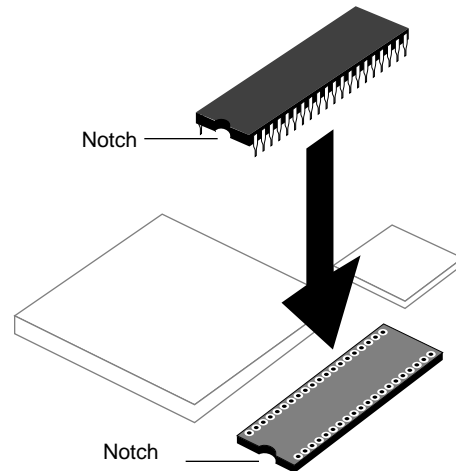
**Figure 1-13** Removing the PROM Chip

4. Locate the package with the correct PROM chip for your workstation. There are two packages: one for Indigo<sup>2</sup> (R4X00) systems, and one for POWER Indigo<sup>2</sup> (R8000) systems. (You identified your workstation's processor type earlier—see "Identifying Your Graphics Board and Processor Type" on page 2 if necessary.)

There may be extra PROMS included—these are spares.

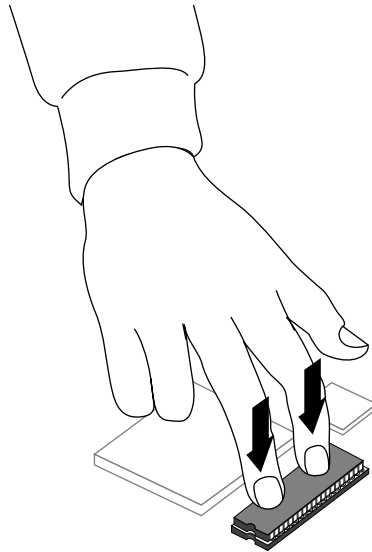
5. Install the new PROM chip.
  - Grasp the new PROM chip. Orient it above the socket on the system board so the end with the semicircular notch lines up with the notch in the socket. (See Figure 1-14.)
  - Line up all of the pins on the PROM with the corresponding holes in the socket.

Make sure you line up the notch on the PROM chip with the notch in the socket and that all the pins are aligned with corresponding holes. If you install the PROM chip backwards, or if the pins are not aligned, you will damage the PROM chip, and the system will not power on.



**Figure 1-14** Lining Up the PROM Chip

6. Once the pins are lined up, press down firmly on the top of the PROM chip until it is completely and evenly seated in the socket, as shown in Figure 1-15.



**Figure 1-15** Pressing the PROM Chip Into the Socket

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

You have now finished installing the new PROM chip and are ready to install the Presenter adapter board on the graphics board.

## Installing the Presenter Adapter Board



**Figure 1-16** Standoff

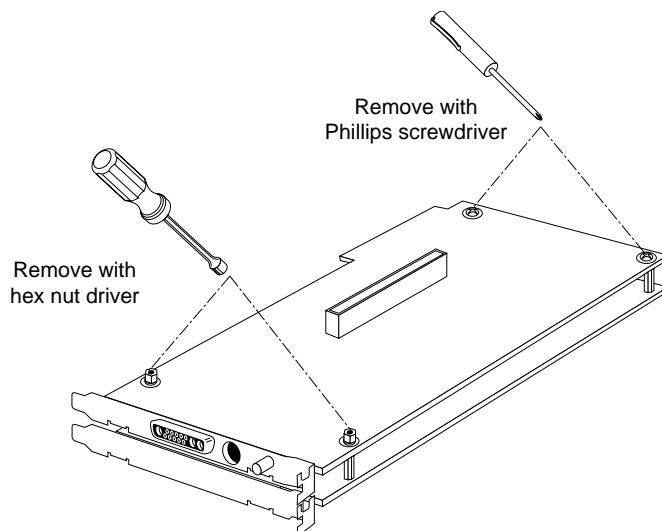
Before installing the Presenter adapter board, you need to install standoffs on the topmost board of the graphics board set. Standoffs are short, hexagonal posts provided in a plastic bag (see Figure 1-16). These act as spacers between the adapter board and the graphics board set.

**Note:** The figures in this section show an XZ or XZ<sup>+</sup> graphics board set. Follow the same instructions for an Extreme graphics board set.

To install the standoffs follow these steps:

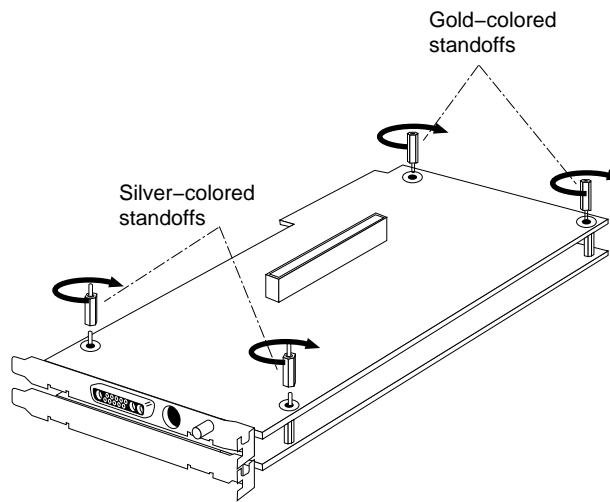
1. Remove the screws and hexnuts from the graphics board you removed from your workstation.
  - Using the Phillips screwdriver, remove the two Phillips screws from the corners of the graphics board set, as shown in Figure 1-17.
  - Using the hex nut driver, remove the two hex nuts from the opposite corners of the graphics board set.

**Tip:** If the standoffs beneath the hex nuts start turning as you're loosening the hex nut, use the open-ended wrench provided in this kit to hold the standoff while you loosen the hex nut.



**Figure 1-17** Removing the Screws and Hex Nuts From the Graphics Board Set

2. Install the standoffs as follows:
  - Where you removed the Phillips screws, insert the two shorter, gold-colored standoffs in the locations shown in Figure 1-18. Tighten them until they are finger tight.
  - Where you removed the hex nuts, insert and tighten the two longer, silver-colored standoffs in the locations shown in Figure 1-18. Tighten them until they are finger tight.

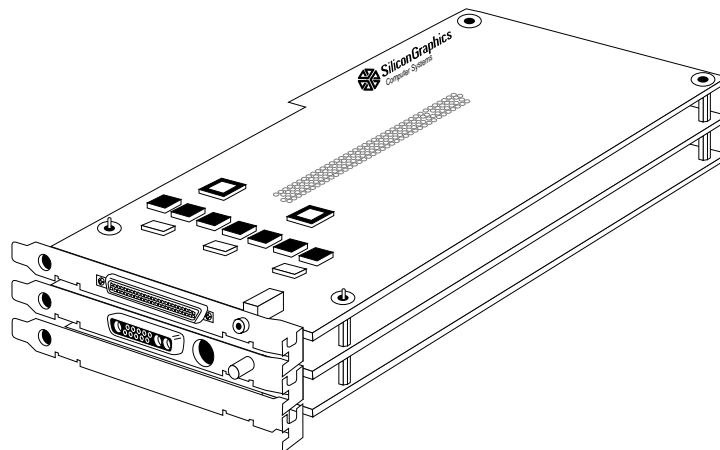


**Figure 1-18** Installing the Four Standoffs on the Graphics Board Set

3. Remove the Presenter adapter board from its antistatic bag.
4. Position the adapter board over the graphics board.
  - Grasp the adapter board by the sides, with the male connector on the underside.
  - Loosely place the adapter board on top of the graphics board so that the male connector on the underside of the adapter board aligns with the female connector on the graphics board, as shown in Figure 1-19.

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

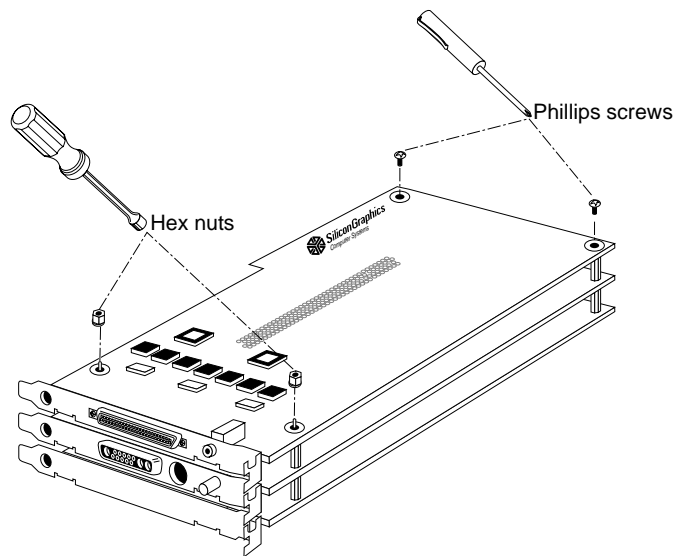
- Check that each screw hole on the adapter board is aligned with a matching standoff on the graphics board.
- Place your fingers or thumbs on the adapter board above the connectors and press down gently but firmly until the connectors fit snugly.



**Figure 1-19** Installing the Adapter Board on the Graphics Board

5. Verify that the adapter board is properly seated.
  - Look underneath the adapter board to see the two connectors. It may be difficult to see them. The male and female connectors must be touching along the entire shared surface. When you press on the top board, it shouldn't wobble.
6. Secure the adapter board to the graphics board, as shown in Figure 1-20.
  - Using the Phillips screwdriver, insert and tighten two Phillips screws in the locations shown in Figure 1-20. As you tighten the screws, alternate between them so that the board is fastened evenly.
  - Using the hex nut driver, insert and tighten two hex nuts in the locations shown in Figure 1-20. As you tighten the nuts, alternate between them so that the board is fastened evenly.

If the screw holes do not line up, repeat steps 4 and 5. Make sure that the connectors on the adapter board are fully seated.



**Figure 1-20** Inserting the Screws on the Adapter Board

You are finished installing the Indigo<sup>2</sup> Presenter adapter board on the graphics board and are ready to replace the graphics board set.

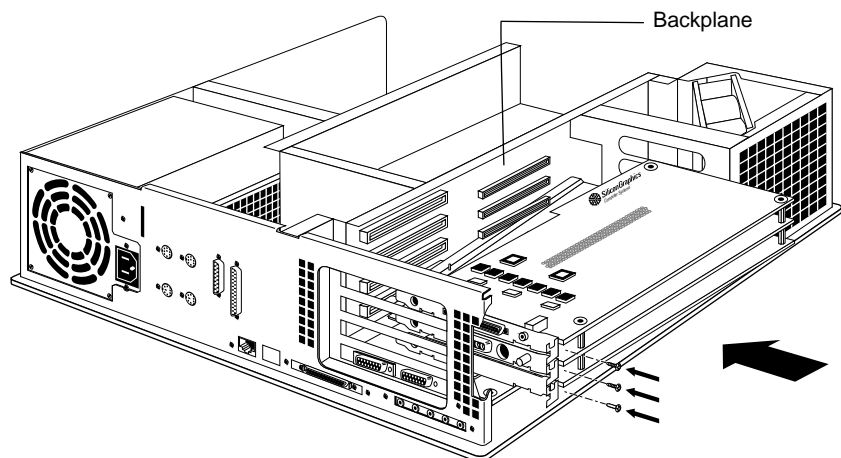


## Replacing the Graphics Board Set

Follow these steps to replace the graphics board set.

**Note:** The figures in this section show an XZ or XZ<sup>+</sup> graphics board set. Follow the same instructions to replace an Extreme graphics board set.

1. Align the metal backplates on the graphics board set with the I/O slots on the chassis. At the same time align the opposite edges of the board set with the metal grooves on the chassis. See Figure 1-21.

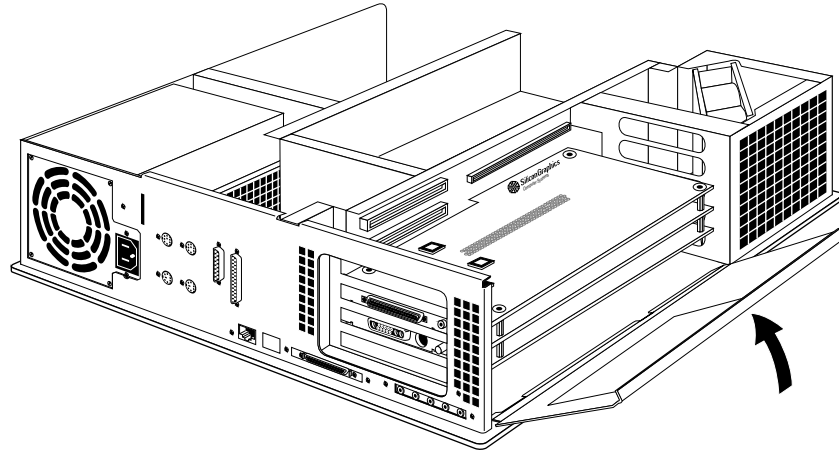


**Figure 1-21** Installing the Graphics Board Set With Adapter Board

2. Push the board set into the chassis until the connectors on the back of the graphics board set are securely joined with the connectors on the backplane.
3. Insert and tighten the screws that hold the board set to the chassis. The screw openings are on the metal extensions, as shown in Figure 1-21.

If you have an Extreme graphics board set, there are four screws to insert and tighten.

4. Tilt the metal panel in front of the slots up until it snaps into place, as shown in Figure 1-22.



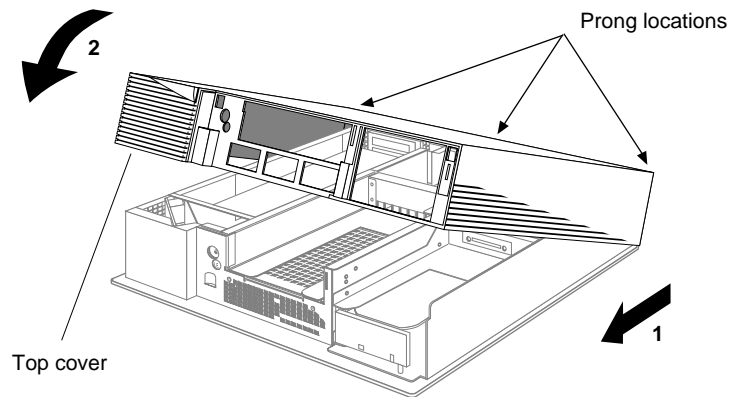
**Figure 1-22** Closing the Metal Panel

You are now ready to replace the top cover and connect the cables.

## Replacing the Top Cover and Connecting the Cables

To replace the cover of your Indigo<sup>2</sup> workstation, follow these steps:

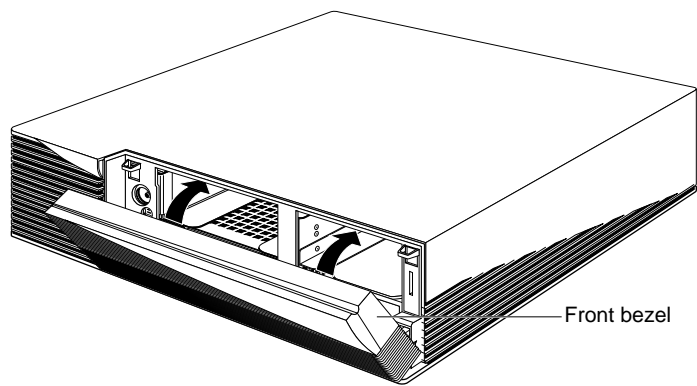
1. Place the prongs on the underside of the cover into the slots under the top ridge of the backplane of the chassis, as shown in Figure 1-23.
2. Lower the cover onto the chassis until it snaps into place.



**Figure 1-23** Replacing the Top Cover on the Indigo<sup>2</sup> Workstation

3. Remove the wrist strap that is attached to your arm and the chassis.

4. Replace the front bezel.
  - Place the tabs on the bottom of the bezel in the grooves in the front of the chassis, as shown in Figure 1-24.
  - Tilt the bezel up until it snaps into place.



**Figure 1-24** Replacing the Front Bezel on the Indigo<sup>2</sup> Chassis

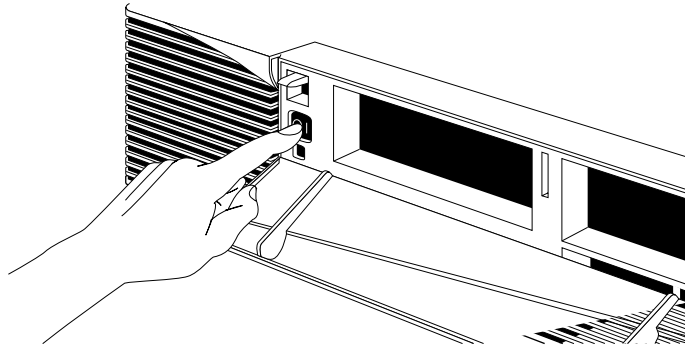
5. Reconnect the power and monitor cables you removed earlier.

You are finished installing the PROM chip and the Presenter adapter board and are ready to install the software.

## Installing the Software

Follow these instructions to install the software.

1. Turn on your monitor.
2. Turn on the system power.
  - Open the front cover by snapping it away from the top edge of the chassis and tipping it down.
  - Press the power switch to turn on the system, as shown in Figure 1-25.



**Figure 1-25** Turning On the Indigo<sup>2</sup> Workstation

3. Read the online software release notes on the CD.



## Setting Up and Using the Presenter

This chapter explains how to set up the Presenter as a monitor for your Indigo<sup>2</sup> or POWER Indigo<sup>2</sup> workstation, and how to use it on the customized Dukane overhead projector to project images on a screen.

**Caution:** Your Presenter is designed to function at maximum performance and reliability with the Dukane Overhead Projector. It is possible to use it with other projectors; however, cooling of the display, stable mounting, and brightness of the projected image will all be compromised. A bright overhead projector without proper cooling of the display may cause permanent damage to the Presenter.

### Setting Up the Presenter

To set up the Presenter with the Indigo<sup>2</sup> or POWER Indigo<sup>2</sup> workstation, follow these steps.

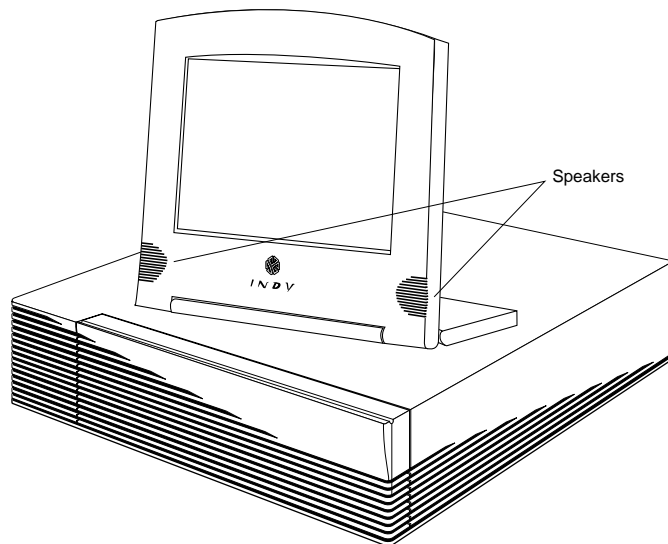
1. Unpack the Presenter.
  - Lift the Presenter and the external cables from the box. It's a good idea to save the original shipping materials in the event that you need to return the Presenter for service.
  - Remove the Presenter from the plastic bag.

**Note:** Don't be concerned that the name on the Presenter is "Indy Presenter." By installing the Indigo<sup>2</sup> Presenter adapter board, the Indy Presenter works on Indigo<sup>2</sup> and POWER Indigo<sup>2</sup> workstations.

2. Remove the protective film from the screen, being careful not to get fingerprints on the coated-glass surface.

The display is made of glass coated with optical films and is the most expensive component in the Presenter. A sharp instrument such as a pen can scratch the surface. If a hard object falls on the Presenter, the glass could break.

3. Tilt the base of the Presenter to form a stand, as shown in Figure 2-1.
4. Place it on top of your Indigo<sup>2</sup> workstation. You can leave your CRT monitor connected to the Indigo<sup>2</sup> while using the Presenter.



**Figure 2-1** Placing the Presenter on Top of the Indigo<sup>2</sup> Workstation

You are now ready to connect the Presenter's external cables.



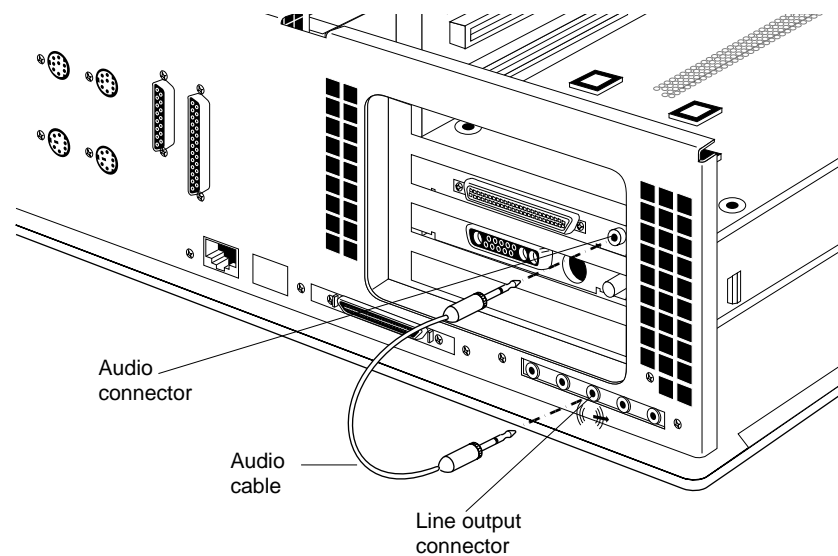
## Connecting the External Cables

You must connect three cables before using the Presenter:

- the short, black audio cable
- the interface cable (the one with identical elongated “D” shaped connectors at each end)
- the power cable

Follow these steps to connect the cables.

1. Connect the short, black audio cable as follows:
  - Connect one end to the adapter board’s audio connector, as shown in Figure 2-2. (You can connect either end.)
  - Connect the other end to the line output connector on the rear of the Indigo<sup>2</sup> chassis.

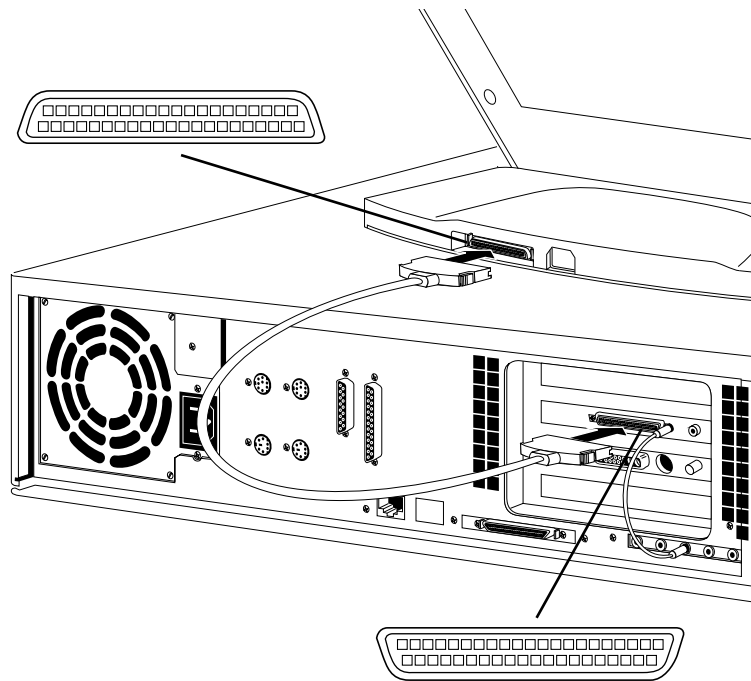


**Figure 2-2** Connecting the Audio Cable

2. Connect the interface cable to the Presenter. It's important that you connect the interface cable *before* the power cable.

The connectors on the cable and on the Presenter have an elongated "D" shape. Make sure the "D" shapes match each other.

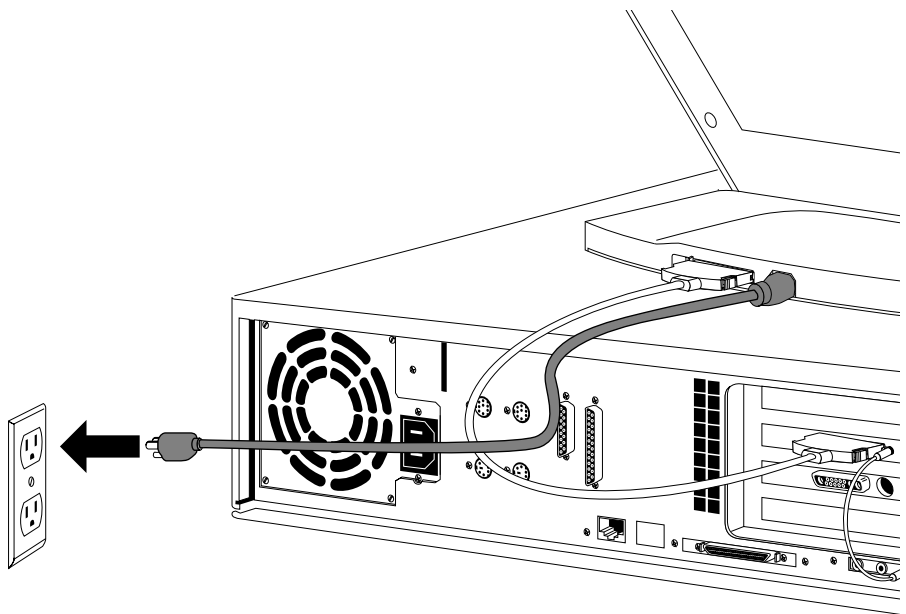
- Connect one end of the interface cable to the connector on base of the Presenter, as shown in Figure 2-3. (You can connect either end of the cable.)
- Connect the other end of the interface cable to the rear of the Indigo<sup>2</sup> chassis.



**Figure 2-3** Connecting the Interface Cable to the Presenter

3. Connect the power cable to the Presenter and then to an electrical outlet, as shown in Figure 2-4. (Figure 2-4 shows the power cable for the U.S.A. The power cable for your country may look different.)
  - Pick up the power cable and connect the socket end to the power connector on the base of the Presenter.
  - Connect the other end to a three-pronged grounded electrical wall outlet or power strip.

**Note:** The power supply for Indigo<sup>2</sup> and for the Presenter is auto-ranging. With the appropriate power cable or adapter for your country, you can plug the Presenter into almost any power source (50-60 Hz, 110/220 VAC).



**Figure 2-4** Connecting the Power Cable

You are now ready to use the Presenter.

## Using the Presenter

Now that you've installed the necessary hardware and software and connected the cables, you're ready to use the Presenter.

### Turning On the Presenter

The Presenter has no power switch. If your Indigo<sup>2</sup> workstation and monitor are on when you connect the Presenter, you start the Presenter from the Monitor Panel. Follow the steps in this section.

If you have a high resolution CRT monitor connected to the workstation and you turn on the Presenter, the monitor is set to 1024 x 768 pixels. Therefore icons at the extreme edges of your screen may not be visible. To remedy this, move the icons away from the edges of the screen before turning on the Presenter. If you disconnect the Presenter and wish to return your CRT monitor to its default resolution, type the following from a UNIX shell:

```
su  
/etc/killall Xsgi
```

If the Presenter does not light up, make sure the external cables are connected correctly. Then go to Chapter 3, "Troubleshooting," for help in solving the problem.

**Note:** The Presenter takes about a minute to warm up, so the image may appear dim at first.

1. From the Find toolchest, choose "Control Panels."
2. From the Control Panels page, double-click the *monpanel icon*.
3. When the Monitor Panel appears, click the "Turn on Presenter" button.
4. If you have a root password set, enter it when prompted, and click the OK button.

You see a message that turning on the Presenter stops all running applications. Close any applications for which you may lose data.

5. Click *Continue* to turn on the Presenter.

## Restarting the Presenter

If the Presenter is disconnected from the Indigo<sup>2</sup> after the workstation and Presenter are turned on, and you reconnect the Presenter, you can restart it from the Monitor Panel. Note that restarting the Presenter resets the backlight and bit mode to their original settings, that is, nearly full backlight and 12-bit mode.

Follow these steps:

1. From the Find toolchest, choose “Control Panels.”
2. From the Control Panels page, double-click the *monpanel icon*.
3. When the Monitor Panel appears, click the *Restart Presenter* button.
4. Close the Monitor Panel by clicking the *Close* button in the lower right-hand corner of the panel. Or you can leave it open and minimize it by clicking the minimize button in the upper right-hand corner of the panel.

**Note:** If you have no CRT monitor attached, but are on a network, you can use the Monitor Panel to restart the Presenter. Log in to your system remotely, and type `monpanel -restart` at the shell prompt.

## Adjusting the Brightness

The Monitor Panel contains labels and buttons that allow you to adjust the brightness. Follow these steps:

1. If the Monitor Panel is not open, from the Find toolchest, choose “Control Panels.”
2. From the Control Panels page, double-click the *monpanel icon*.
3. Move the slider to adjust the brightness of the display.
4. Close the Monitor Panel by clicking the *Close* button in the lower right-hand corner of the panel. Or you can leave it open and minimize it by clicking on the minimize button in the upper right-hand corner of the panel.

You can also access the Monitor Panel from a UNIX<sup>®</sup> shell by typing:

`monpanel`

**Note:** For more information on using the Monitor Panel for the Presenter, see the reference page (man page). From a shell window, type:

`man monpanel`

### Switching to 15-Bit Mode

The default color mode on the Presenter is 12-bit. In this mode, some smooth shaded images appear banded. If you wish to decrease this banding, you can do so by switching to 15-bit mode. In that mode, however, some colors flicker. So you may want to switch back and forth, depending on the types of images you are viewing.

To switch between 12-bit and 15-bit mode, use the Monitor Panel. Follow these steps:

1. If the Monitor Panel is not open, from the Find toolchest, choose "Control Panels."
2. From the Control Panels page, double-click the *monpanel icon*.
3. Click the 15-bit mode button.
4. Close the Monitor Panel by clicking the *Close* button in the lower right-hand corner of the panel. Or you can leave it open and minimize it by clicking on the minimize button in the upper right-hand corner of the panel.

### Adjusting the Volume and Tone of the Speakers

The Presenter speakers are designed to work with the standard Indigo<sup>2</sup> speaker. You adjust the volume and tone of the Presenter stereo speakers through the Audio Panel.

Follow these steps:

1. From the Find toolchest, choose "Control Panels."
2. From the Control Panels page, double-click the *apanel icon*.

3. From the Options menu, choose "Presenter Audio."
4. Adjust the speaker mix using the Presenter Speaker controls on the Presenter Audio panel.

Note that while the Presenter Audio panel is running, you can adjust the volume of the Presenter speakers independently of the Indigo<sup>2</sup> speakers by selecting "Output Sliders Independent" from the Audio Panel Options menu.

5. Adjust the tone by moving the tone control slider on the right of the panel.
6. To mute the Presenter speakers, click the *Mute* button on the Presenter Audio Panel.
7. Close the Audio Panel by clicking the *Close* button in the lower right-hand corner of the panel. Or you can leave it open and minimize it by clicking on the minimize button in the upper right-hand corner of the panel.

You can also access the Audio Panel from a UNIX shell by typing:

```
apanel
```

For further information on the Audio Panel:

- Select "On-line Books" from the Help toolchest. Choose "*Media Tools User's Guide*" and search for "Audio Panel."
- From a shell window, type:

```
man apanel
```

to see the reference page (man page).

## Using Headphones

If you use headphones, you probably want to mute the Presenter stereo speakers temporarily. Follow these steps to do this:

1. From the Find toolchest, choose "Control Panels."
2. From the Control Panels page, double-click the *apanel* icon.
3. Select "Presenter Audio" from the Options menu.

4. Click the *Mute* button on the Presenter Audio panel.

Note that clicking the Mute button on the main Audio Panel mutes only the Indigo<sup>2</sup> speakers, and not the Presenter speakers.

5. Close the Monitor Panel by clicking the *Close* button in the lower right-hand corner of the panel. Or you can leave it open and minimize it by clicking on the minimize button in the upper right-hand corner of the panel.

### Turning Off the Presenter

The Presenter turns off automatically when you turn off the Indigo<sup>2</sup> workstation. To turn off the workstation, press and release the power button on the front.

If you have a CRT monitor connected to your Indigo<sup>2</sup> workstation, you can disconnect the Presenter's interface and power cables instead of powering off the workstation. To restart the Presenter, connect the interface cable and then the power cable. Then open the Monitor Panel on the CRT monitor by choosing "Control Panels" from the Find toolchest, double-click the *monpanel* icon, and click the *Restart Presenter* button.

**Note:** It's important when you reconnect the Presenter's cables that you connect the interface cable first and then the power cable. Connecting them in the reverse order results in a distorted image.

If no CRT monitor is connected to the workstation, you can disconnect the Presenter's interface and power cables instead of powering off the workstation. To restart the Presenter, reboot your workstation after connecting the interface cable and the power cable. Leaving the CRT connected determines whether or not you need to reboot to restart the Presenter.

Turning off the Presenter when leaving for the day or for the weekend is a good idea. Leaving the display on for long periods of time shortens the life of the display's backlight.



## Setting Up the Presenter on the Dukane Customized Projector

Follow these steps to set up the Presenter with the Silicon Graphics customized Dukane Overhead Projector.

**Caution:** Your Presenter is designed to function at maximum performance and reliability with the Dukane Overhead Projector. It is possible to use it with other projectors; however, cooling of the display, stable mounting, and brightness of the projected image will all be compromised. A bright overhead projector without proper cooling of the display may cause permanent damage to the Presenter.

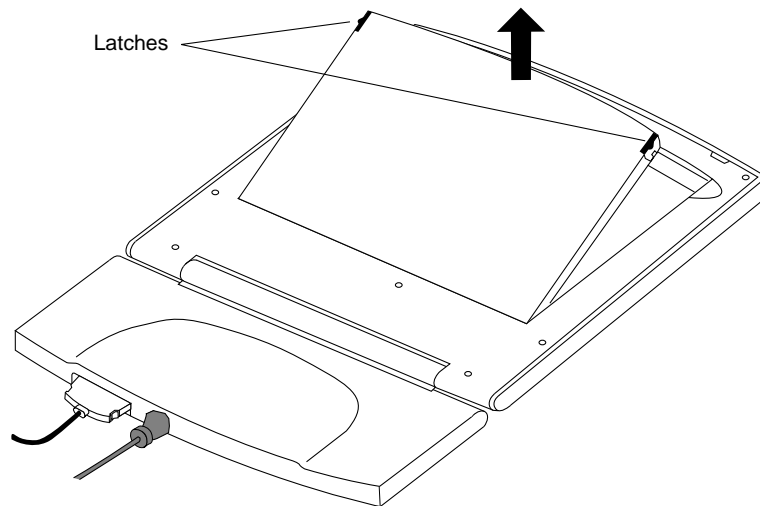
1. Set up the customized overhead projector, following the instructions in the manual that comes with the projector.
2. Turn on the overhead projector. Note that it takes about a minute to warm up. An initial bright flash followed by a dark interval before the brightness increases is normal.

**Note:** If you are projecting over a distance of more than 6 feet, you probably won't want to use the projector's wide-angle lens with the Presenter. Rotate the wide-angle lens away from the standard lens. However, if you need to project a larger image from a short distance, use the wide-angle lens.

3. If the Presenter is not already on, and you have a CRT monitor attached, you can start or restart the Presenter from the Monitor Panel. See "Restarting the Presenter" on page 33. Or press and release the power button on the front of the Indigo<sup>2</sup> workstation to turn on the Presenter and the workstation.
4. Bring up the image on the Presenter display that you wish to project on the overhead projector.

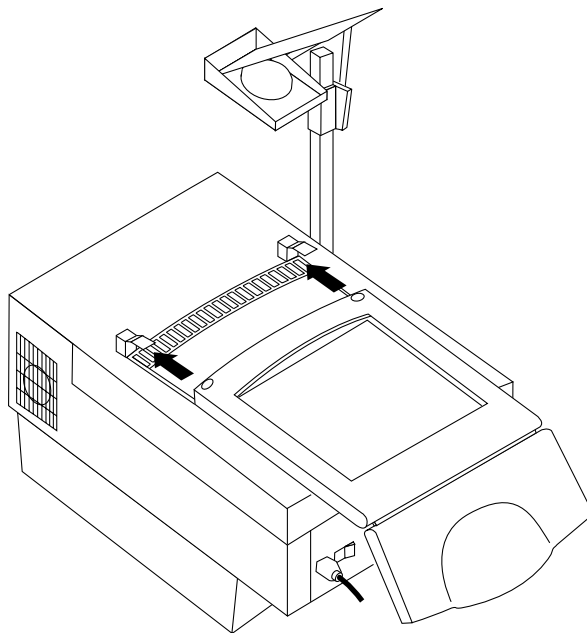
5. Remove the backlight panel from the Presenter. This automatically turns off the Presenter's backlight.
  - Place the Presenter face down on a flat surface.
  - Press in the latches on either side of the backlight panel, tilt up the panel, and remove it, as shown in Figure 2-5.
  - Carefully place the backlight panel on a surface where it will not get damaged or scratched. Scratches will not affect performance, but if they are large enough, you will see them through the display.

Do not touch the coated-glass surface of the display with your hands or with any instrument. An instrument such as a pen tip can scratch the surface.



**Figure 2-5** Removing the Backlight Panel

6. Place the Presenter on the overhead projector.
  - Place the Presenter *face down* on the surface of the projector so that only the back of the Presenter is visible, as shown in Figure 2-6.
  - Slide the Presenter under the two clips on the projector.
  - Rotate the base of the Presenter down so it is out of your way.



**Figure 2-6** Placing the Presenter on the Overhead Projector

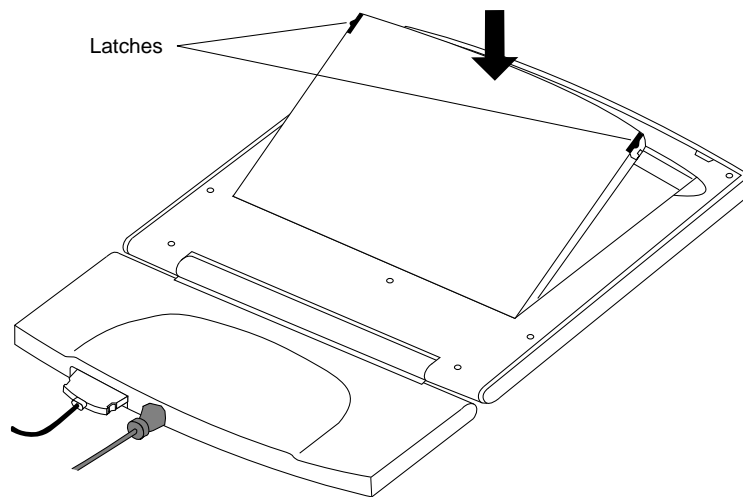
If the image does not project properly, check that the Presenter is face down on the projector's surface, and clipped in securely. For additional help, go to Chapter 3, "Troubleshooting."

7. When you are finished with your presentation, turn off the overhead projector, and replace the backlight panel, as shown in Figure 2-7.

**Caution:** Make sure you turn the projector off before replacing the backlight panel. Having both light sources on at the same time can permanently damage the display.

- Tilt the backlight panel and insert the lower edge into the slots on the Presenter.
- Lower the panel over the Presenter, aligning the two catches.
- Press down lightly until you hear a click as the catches engage.

**Note:** It takes a few minutes for the backlight to reach full brightness again.



**Figure 2-7** Replacing the Backlight Panel

8. Rotate the base up and slide the Presenter out from under the two projector clips.

The Presenter is now ready to be used as a desktop monitor.

### **Transporting the Dukane Overhead Projector**

Although the overhead projector's carrying case is designed to withstand normal shock and handling, if it is mishandled by the airlines, the projector may get damaged. To take the Dukane Overhead Projector with you when you travel, Silicon Graphics recommends that you place it in its carrying case, and pack the carrying case in the original shipping carton with the packing materials. Then check it in as baggage or ship it. Using the carrying case alone may result in damage.

### **Replacing the Bulb on the Dukane Overhead Projector**

The bulb in the Dukane projector is a long-life bulb that should not need replacing before 750 hours of use. If you believe the bulb needs replacing, do not attempt to do it yourself. Contact your service provider. If you are instructed to return the projector to Silicon Graphics, pack it in its carrying case. Then place the carrying case in the original shipping carton, and ship it as instructed by your service provider.

## **Cleaning and General Care of the Presenter**

Handle your Presenter with care. A sharp instrument such as a pen can scratch the display's surface. Do not place objects on top of the glass surface.

From time to time dust builds up on the surface of the display, and you need to clean it to get the best possible image. Follow the steps in this section to clean the display, using the cleaning kit provided with the Presenter.

**Caution:** It's important that you use only the contents of the Cleaner Kit provided in this package to clean the display. Using other substances, abrasive cleaners, or cleaning pads to clean the unit will scratch or damage the display's surface.

There is no need to turn off the Presenter or remove the external cables before cleaning, as long as you don't spray directly on the Presenter's surface.

1. Spray the cleaning liquid lightly on the cloth provided in the Cleaner Kit. Do not spray directly on the coated-glass surface, as the liquid may drip inside the unit and damage the components.
2. Wipe the front coated-glass surface of the Presenter gently with the cloth.
3. Remove the backlight panel, if it's not already removed.
  - Place the Presenter face down on a flat surface.
  - Press in the latches on either side of the backlight panel, and lift it up.
4. Use the cloth to wipe the back coated-glass surface gently.
5. Replace the backlight panel.
  - Tilt the panel and insert the lower edge into the slots on the Presenter.
  - Lower the panel over the Presenter, aligning the two catches.
  - Press down lightly until you hear a click as the catches engage.

## Using a Screen Saver

Do not disable your workstation's screen saver program when using the Presenter. As with any CRT monitor, leaving an image up for long periods of time on the Presenter without a screen saver may cause the image to be burned in to the display's backlight.

## Troubleshooting

This chapter contains information on solving problems that you may encounter when using your Presenter.

### Common Problems

If you think there may be a problem with your Presenter, read the following sections to help isolate and solve it. If the problem persists after following these suggestions, call your service provider.

#### No Image on the Presenter

1. Make sure that the Indigo<sup>2</sup> workstation is turned on. There is no on/off switch on the Presenter. If the Presenter cables are connected properly, it powers up automatically when you turn on the Indigo<sup>2</sup> workstation. The Presenter takes about a minute to warm up to full brightness.
2. Check that the backlight panel is fully seated. Full contact is required to turn on the backlight.
3. Check that the power cable is connected securely to the Presenter and to a working wall outlet or power strip.
4. Check that the interface cable is connected securely to the Presenter and to the correct connector on the rear of the Indigo<sup>2</sup> workstation. (See “Connecting the External Cables” on page 29.)

If either step 3 or step 4 was the problem, and you have a CRT monitor connected, you can use the Control Panel to restart the Presenter. (Choose “Control Panels” from the Find toolchest and double-click the *monpanel* icon.) Otherwise, restart the Indigo<sup>2</sup> by pressing and releasing the power button on the front of the system, and the Presenter comes up normally.

### **Image Is Too Light or Too Dark**

Flat panel displays take about a minute to warm up after being turned on. Until the Presenter has warmed up, the image may appear faded or dim.

Flat panel displays look different when viewed from different angles. If you view from above, the display appears dark. If you view from below, the display appears light.

The display is best viewed from slightly above straight on. Tilt the display base forward or back to find the best view.

### **Image Is Distorted**

When you connect the Presenter, if the image is distorted it may be because you connected the power cable before the interface cable. Remove the cables from the Presenter. Connect the interface cable first and then the power cable. Then reboot your workstation.

### **Faint Vertical Streaks Above or Below Edges of Windows**

If you have several windows open on the screen, and are using the Presenter as a desktop monitor, you may see faint vertical streaks above or below the left or right edges of a window. Or you may see a light band across the bottom edge of the screen below a window.

This is caused by crosstalk between transistors in the panel, and is normal in liquid crystal display technology. The faint streaks do not detract from the functionality of the display. You can minimize them by rearranging the windows, choosing a different background, or adjusting the brightness of the display to about 90% of maximum through the Monitor Panel.

If the streaks become so bright as to detract when using the Presenter on an overhead projector, contact your service provider about a solution to the problem.



**No Image on the Overhead Projector or Image Is Reversed**

1. Check that the overhead projector is turned on and glowing brightly. The overhead projector takes about a minute to warm up. (Refer to the manual that comes with the projector.)
2. Check that the Presenter is placed face down on the overhead projector.
3. Make sure that the Presenter's backlight panel has been removed.
4. The bulb in the Dukane overhead projector may be burned out. The bulb is a long-life bulb that should not need replacing before 750 hours of use.

If you think this is the problem, do not attempt to replace the bulb yourself. Contact your service provider. You may be instructed to return the projector to Silicon Graphics. If so, pack the projector in its carrying case. Then place the carrying case in the original shipping carton, and ship it as instructed by your service provider.

**No Sound From the Stereo Speakers**

1. Check that you have installed the small, black audio cable correctly. (See Figure 2-2.)
2. The stereo speakers may have been muted in order to use headphones. To turn on the speakers, choose "Control Panels" from the Find toolchest and double-click the *apanel* icon. Select "Presenter Audio" from the Options menu. If the *Mute* button on the Presenter Audio panel is activated, click on it to turn on the speakers.

## Diagnostics Tests for the Presenter

If, after following the suggestions in this chapter, you still believe there is a problem with the Presenter, run the Confidence Test. Follow these steps to run the Confidence Test.

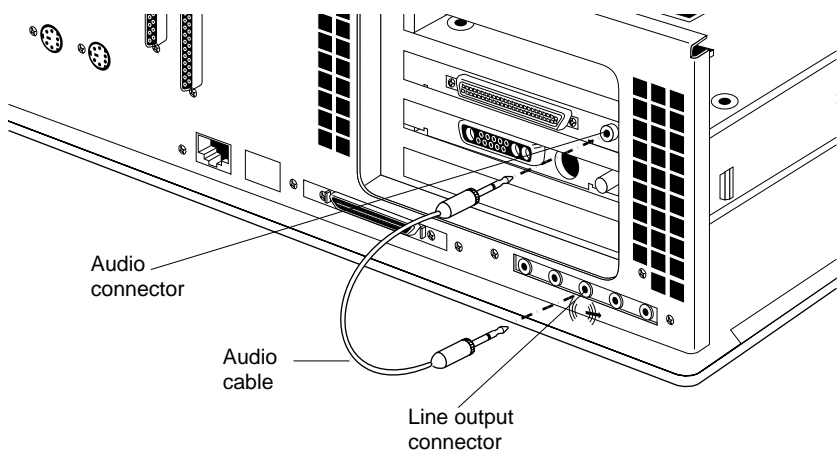
1. From the System toolchest, choose "Run Confidence Tests."  
You see the Confidence Tests form.
2. Select the *Presenter* icon and click *Open*, or double-click the icon.
3. Follow the instructions on each screen to test the display, speakers, and adapter board.
4. To close the confidence test, press **<Esc>**.

If any of the tests indicate a failure, contact your service provider for further instructions.

## Replacing the Presenter Adapter Board

If diagnostic tests indicate a problem with the Presenter adapter board, and if you are instructed by your service provider to return it and install a replacement board, follow these steps.

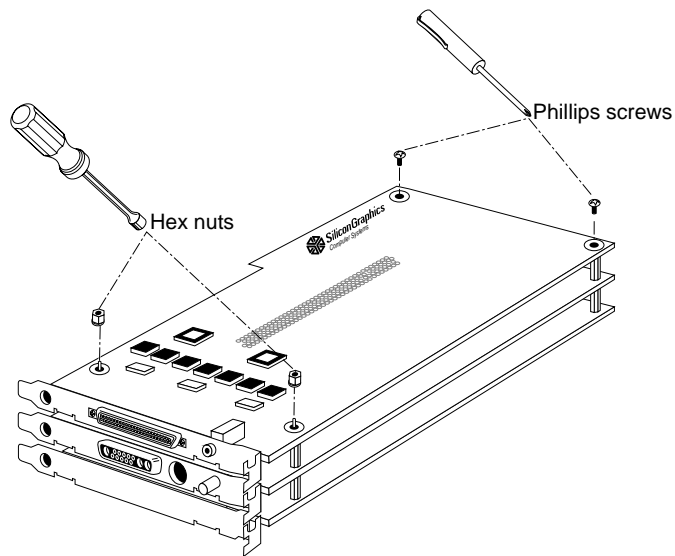
1. Power off the Indigo<sup>2</sup> workstation by pressing and releasing the power switch. (See "Powering Off the System" on page 6 if necessary.)
2. Disconnect the small, black audio cable from the audio connector on the Presenter board and from the line output connector on the rear of the chassis. (See Figure 3-1.)



**Figure 3-1** Removing the Audio Cable

3. Disconnect the power and monitor cables from the rear of the workstation.
4. Remove the front bezel and top cover of your Indigo<sup>2</sup> workstation. If necessary, see "Removing the Top Cover" on page 8.
5. Open the metal panel in front of the expansion slots by pulling up on the panel and lowering it.
6. Remove the graphics board set with attached Presenter board, following the instructions in "Removing the Graphics Board Set" on page 10.

7. Disconnect the Presenter adapter board from the graphics board set as follows:
  - Using a Phillips screwdriver, remove the two Phillips screws from the location shown in Figure 3-2.
  - Using a hex nut driver, remove the two hex nuts from the location shown in Figure 3-2.



**Figure 3-2** Removing the Screws and Hex Nuts from the Adapter Board

- Pull up on the adapter board until it disconnects from the graphics board.
8. Install the replacement board following the instructions in “Installing the Presenter Adapter Board,” but starting with step 3.

## Returning the Presenter to Silicon Graphics

If diagnostic tests identify a problem with the Presenter, call your service provider. If you are instructed to return the Presenter, follow these instructions.

1. Disconnect the power cable and interface cable from the rear of the Presenter.
2. Complete the Part Request Form from the last page of this manual.
3. Pack the Presenter and the completed Part Request Form in the original shipping carton.
4. Ship the carton to your service provider.

## 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.



## Technical Specifications and Regulatory Information

### Technical Specifications

The table below lists the technical specifications for the Presenter liquid crystal display.

**Table 4-1** Technical Specifications for the Presenter

<b>Electro-Optical</b>	Pixel resolution	1024 H (x3 RGB stripe) x 768 V
	Color resolution	12-bit and 15-bit (12-bit True + 3-bit Frame Rate Modulation)
	Color gamut	Red: $x = 0.61, y = 0.36$ ; Green: $x = 0.27, y = 0.62$ ; Blue: $x = 0.13, y = 0.11$
	Contrast ratio	100:1 minimum
	Brightness	80 Cd/m <sup>2</sup> minimum
	Response time	≤50 ms maximum, rise + fall
	Viewing angle	Horizontal: ±45°; Vertical: +30°/-10° (optimized for 12:00)
	Display surface	Front: Anti-glare 3H hardcoat Rear: Clear 3H hardcoat
<b>Video</b>	Interface to Indigo <sup>2</sup>	GIO option board connects to the Indigo <sup>2</sup> video connectors on the graphics board, generating 24-bit high-resolution digital video to drive the flat panel display.

**Table 4-1** (continued) Technical Specifications for the Presenter

<b>Audio</b>	Interface to workstation	Analog stereo
	Output	Stereo, .6 W per channel, 150 Hz to 18 KHz (used with Indigo <sup>2</sup> speaker)
	Control	I <sup>2</sup> C interface (Phillips bus structure) to control speaker volume, backlight brightness, tone, and stereo balance
<b>Power Requirements</b>	Power	30 watts AC plus 10 watts @ 5 VDC for Presenter adapter board
	Source	110/220 VAC 50-60 Hz
<b>Cabling</b>	Display	10-foot, shielded, 34 twisted-pair conductors; internal connector at display end with separate audio plug at system end
	Audio	Separate audio patch cord at system end
	Power	IEC socket with removable 10-foot cable to wall outlet
<b>Physical Characteristics</b>	Size	Display: 12 3/4"H x 12 1/2"W x 7/8"D. Base: 6 1/2"H x 12 1/2"W x 1 1/8"D. Total length folded flat: 18 1/2"
	Weight	7 lbs
	Color	Gray granite
	Hinge	Friction/clutch with 210° rotation
	Backlight	Removable light pipe assembly for use with Dukane Overhead Projector
	Desktop use	Integral base supports desktop use at 0° to -30° tilt



**Table 4-1** (continued) Technical Specifications for the Presenter

<b>Operating Conditions</b>	Temperature	+13°C to +35°C in direct view and overhead projector modes
	Relative humidity	10% to 80% RH, no condensation
<b>Non-Operating Conditions</b>	Temperature	-20°C to +60°C
	Relative humidity	5% to 90% RH, no condensation
	Vibration	0.02", 5-19 Hz 35 G, 5-500 Hz
	Shock	20G, 11 ms, half sine wave direction: X, Y, Z

## Manufacturer's Regulatory Declarations

The following section provides regulatory information for the Indigo<sup>2</sup> Presenter.

### 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.

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

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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 4-1** Japanese VCCI Class 1 Statement

## 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 Indigo<sup>2</sup> 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 Indigo<sup>2</sup> workstation is FCC-compliant under test conditions that include the use of shielded cables between the workstation and its peripherals. Your Indigo<sup>2</sup> workstation 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.

## Product Safety

**Caution:** The power cord is used as a disconnect device. The socket outlet must be installed near the equipment and must be easily accessible.

**Achtung:** Die Netzzuleitung dient als Trennvorrichtung. Die Steckdose sollte sich nahe am Gerät befinden und leicht zugänglich sein.



## Liquid Crystal Display (LCD) Technology

This section contains technical information on liquid crystal display technology.

### Display

The key component in the Indy Presenter is the active matrix display module unit. It is composed of twisted nematic liquid crystal material, sandwiched between two sheets of glass, activated by electronic switches deposited on the inner surface of the glass. The electronic switches vary the voltage applied to the liquid crystal and thus change its transparency.

Vertical stripes of alternating red (R), green (G), and blue (B) colored filters made of organic dyes are located on the front glass plate, under a transparent indium tin oxide electrode. The intersection of each of these colored stripes with an active electronic element forms a subpixel of that color.

The electronic switches on the back glass are known as thin film transistors (TFTs) and are addressed in an x-y matrix from integrated circuit drivers. These drivers, bonded to flexible circuits by tape automated bonding (TAB) techniques, are located around the display edges in the plane of the glass package. Conductive thermoplastic adhesive strips connect the TAB tapes and the electrodes on the TFT glass panel. The assembly is held together by a stamped metal bezel.

A backlight assembly behind the display glass consists of an acrylic light pipe, plastic diffuser, and cold cathode fluorescent (CCF) tubes. Four tubes, two at the top and two along the bottom, produce a bright image with high color saturation.

In Silicon Graphics, Inc.'s implementation, the acrylic light pipe is attached to a rear door that is removable by the user, so the display can be used with

an overhead projector. When the door is removed, a switch opens that disables the CCF tubes and reverses the data stream to the display, causing the image to be flipped right to left. The display can therefore be placed face down, instead of back down, on the projector stage. This is important because it places the color filter layer between the powerful projector beam and the somewhat light-sensitive TFT plate.

In operation, the TFT devices activate subpixel elements in the display by causing a voltage potential across selected portions of the liquid crystal material. These elements are used as variable shutters to control the intensity of white light coming from the CCF panel and reaching the red, green, or blue filters. Combinations of these subpixel elements produce a full pixel (RGB triad) of the proper hue, saturation, and brightness much like a cathode ray tube (CRT).

### **Differences Between LCD and CRT Technology**

If you are accustomed to using a CRT monitor, you will notice that the Presenter's flat panel display is remarkably different.

One of the most noticeable differences is the crispness of text. A CRT pixel is formed by a beam of electrons that scans across the screen. Thus pixels "bloom" at the fuzzy edge of the electron beam and smear into each other as the beam moves. The Presenter's pixels are formed by a combination of light valve and color filter that produces an extremely crisp edge for each subpixel. You can actually see these red, green and blue subpixels when using the Presenter in Overhead Projector mode if you stand very close to the projector screen.

Another difference is the lack of distortion in the image displayed by the Presenter. There are two reasons a CRT cannot achieve this: the physics of creating glass tubes makes it almost impossible to make them flat, and the magnetics of controlling an electron beam makes it almost impossible to get straight lines everywhere on the CRT.

A third difference is the lack of flicker on the Presenter's flat panel. CRTs flicker because the electron beam can only be in one place at a time. Thus each pixel on a CRT is being driven only about a millionth of the time. The phosphor has a "persistence" that causes it to emit light over a little longer period, but it still flickers. In the Presenter's flat panel, all pixels are being

driven all the time. On refresh some of the pixels change in value. Others stay constant, and thus look perfectly stable.

A fourth difference, which actually works in the CRT's favor, is the electrical phenomenon of crosstalk between the pixels on a flat panel. In a flat panel, whole columns of pixels are powered from the same electronic source. That source bus is a very thin line that hides in the space between the pixels. The result is that with some displayed images, the pixels above or below the image do not receive enough electrons and thus appear lighter than they should. In the worst case, you may see faint vertical streaks on the display. You will probably see them only if you have a solid background and are using the Presenter as a desktop monitor. The streaks are normal in LCD technology. If they become so bright as to always detract from the display's performance, however, contact your service provider about a solution to the problem.

## Quality

The resolution of the Indy Presenter is 1024 x 768 pixels. Therefore your display has 1024 x RGB x 768, or 2,259,296, subpixels — all in an area equivalent to 2.5 times that of a 6-inch silicon wafer. Current technology is not capable of producing a 100% defect-free active matrix display at reasonable costs, although yields are improving steadily. Your Presenter may exhibit a small number of isolated subpixel dropouts, which have been individually screened to make certain they are in unobtrusive locations.

## Backlight Brightness

The output of a fluorescent lamp strongly depends on the minimum bulb wall temperature, because this temperature determines the mercury vapor pressure inside the lamp. The colder the temperature, the more mercury condenses on the inside of the bulb, resulting in decreased light output. At 25°C, the light output is at approximately 80% of its optimum temperature, but at 10°C, the light output could easily degrade to 30% of its maximum. Therefore it takes about one minute for the lamps to warm up to full brightness from a cold start.





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# Part Request Form

RMA#
Closed _/_/___

Company Name
Street Address
City/State/Zip Code
Contact
Phone
Fax
Purchase Order Number

Call ID #	Model Type	Warranty Y N	System Serial # (as found on back panel)
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## System Configuration Information:

System S/W Version _____	Type of failure: <input type="checkbox"/> Solid <input type="checkbox"/> Intermittent	Peripherals: <input type="checkbox"/> DAT <input type="checkbox"/> CD-ROM <input type="checkbox"/> Floptical <input type="checkbox"/> Other_____	Voltage: <input type="checkbox"/> 110 <input type="checkbox"/> 220	Disk (MB/GB) _____	Memory (MB): _____
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Problem description (please describe symptoms, error messages and actions taken):

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Date \_\_\_\_\_

## Failed part information:

Part Number:	Revision:	Date:
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For fast service, please complete this form in its entirety!





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