$Indy\ Presenter^{\rm TM}\ Owner's\ Guide$

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Introduction

Congratulations on purchasing the Indy Presenter $^{\text{TM}}$, 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 Indy Presenter in the IndyTM workstation, how to set up the Indy Presenter as a monitor for your workstation, and how to use the Indy Presenter on the Silicon Graphics[®] customized Dukane[®] overhead projector.

You will also learn how to use the Indy Presenter software, how to transport the Indy Presenter, how to take care of it, 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 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.

Installing the Indy Presenter Hardware and Software

Before using the Indy Presenter, you need to prepare your Indy workstation by installing some hardware and software.

To install the hardware, you will complete these steps:

- Identify which graphics board is installed in your Indy workstation.
- Shut down the system and check the version of your PROM chip from the Command Monitor. (If your Indy has XZ graphics, you do not have to do this step.)
- Remove the cover.
- Remove and replace the PROM chip on the system board (if necessary).
- Install *either* the Indy Presenter adapter *or* the Indy Presenter XZ adapter, depending on your system's graphics configuration.
- Replace the cover.
- Connect the cables and restart your system.

The Indy Presenter Package

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

- Indy Presenter flat-panel monitor
- Power cable and interface cable
- Indy Presenter adapter board *or* the Indy Presenter XZ adapter board in an antistatic bag
- Bag of hardware for installing the adapter board

- PROM chip in an antistatic bag
- Chip removal tool to remove the PROM chip
- Open-ended wrench to remove standoffs and hexnuts
- Phillips screwdriver
- Antistatic wrist strap
- Cleaning kit
- *Indy Presenter Owner's Guide* (this manual)
- Compact disc (CD-ROM)

Identifying Your Indy's Graphics Board

Before starting the installation process, you need to know whether your Indy has the Indy graphics board or the Indy XZ graphics boardset. Follow these steps:

- 1. From the Desktop toolchest, select "Unix Shell."
- 2. At the shell prompt, type:

hinv

- If you see "Graphics board: GR3-XZ," your system has the Indy XZ graphics. Type exit to exit the shell, and go to "Installing the Indy Presenter XZ Adapter Board" on page 30.
- If you see either "Graphics board: Indy 24-bit" or "Graphics board: Indy 8-bit," check the version of your graphics board by typing:

/usr/gfx/gfxinfo

If you see "NG1 revision 3" or greater, your system has the Indy graphics. Type exit to exit the shell, and go to "Checking the PROM Chip Version" on page 3.

If you see either "NG1 revision 1" or "NG1 revision 2," you were one of the first purchasers of an Indy system. You need to upgrade your graphics board, free of charge. Contact your local Silicon Graphics support office for a free graphics board upgrade. When

you have the new graphics board, start with "Checking the PROM Chip Version" on page 3. When you reach the section "Replacing the Graphics Board" on page 19, install the new graphics board.

Checking the PROM Chip Version

You may or may not need to replace your system's PROM chip, depending what PROM version you have. You check the version of the PROM chip 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.

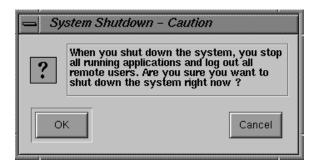


Figure 1-1 System Shutdown Notifier

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

You see the message shown in Figure 1-2.

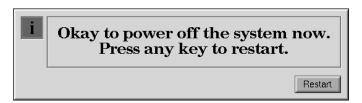


Figure 1-2 Okay to Power Off Notifier

■ Click the *Restart* button.

You then see the message shown in Figure 1-3.

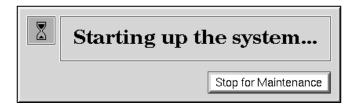


Figure 1-3 Starting Up the System Notifier

- Click on the *Stop for Maintenance* button. 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 Jul 15, 1994 (BE) The date, "Jul 15, 1994" tells you the version of the PROM.

- If your PROM is dated July 15, 1994 or later, you do not need to replace the PROM chip. When installing the upgrade, skip "Replacing the PROM in an Indy Workstation" on page 12, but complete all the other installation steps.
- If your PROM is dated before July 15, 1994, you must replace the PROM chip. Complete all the hardware installation steps.
- 4. After you have checked your PROM version, type exit to exit the PROM monitor.
- 5. 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.

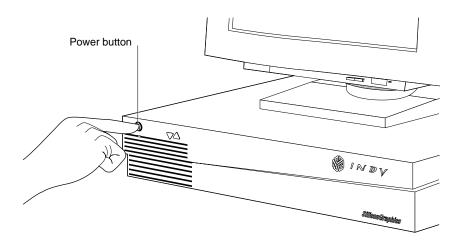


Figure 1-4 Turning Off the Indy Workstation

Removing the Top Cover

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

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

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

- 1. If the monitor is on top of the workstation, move it to one side.
- 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 against the 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, tilt it up, and remove it.

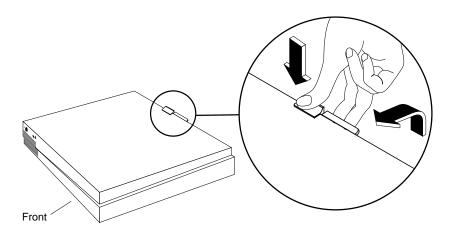


Figure 1-5 Removing the Top Cover From the Indy Workstation

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 either of the Indy Presenter adapter boards, you must first remove any GIO option boards, if installed.

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, compare your system to the one shown in Figure 1-6. Then follow the instructions below.

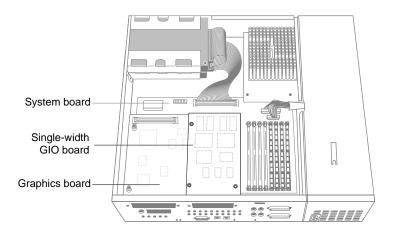


Figure 1-6 Indy Workstation With Single-Width GIO Option Board

| If your Indy workstation has: | Then: |
|---|---|
| One or more GIO option boards installed | Go to step 1 on page 9. |
| No GIO option boards installed | Go to "Replacing the PROM in an Indy Workstation" on page 12. |

1. Locate the GIO option board, as shown in Figure 1-7.

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.

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

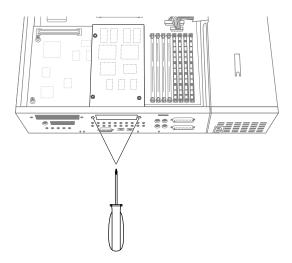


Figure 1-7 Removing the Screws From the GIO Board Connector

4. 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 more than three screws to remove.

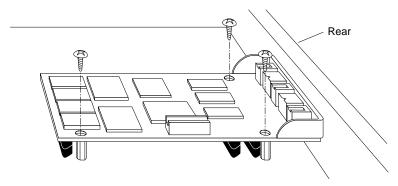


Figure 1-8 Removing the Screws From the GIO option Board

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

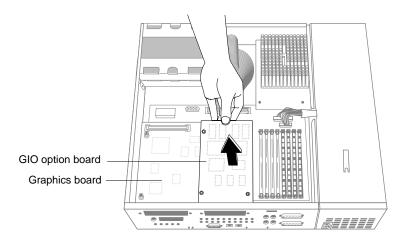


Figure 1-9 Disconnecting the GIO Option Board

You are now ready to either replace the PROM chip, or to install the Indy Presenter adapter board. $\,$

Follow the instructions in the table below.

| If: | Then: |
|--------------------------------|---|
| You are replacing the PROM | Go to "Replacing the PROM in an Indy Workstation" on page 12. |
| You are not replacing the PROM | Go to "Installing the Indy Presenter Adapter Board" on page 23. |

Replacing the PROM in an Indy Workstation

To reach the PROM chip on the system board, you must first remove the graphics board.

Removing the Indy Graphics Board

Follow these steps to remove the graphics board:

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

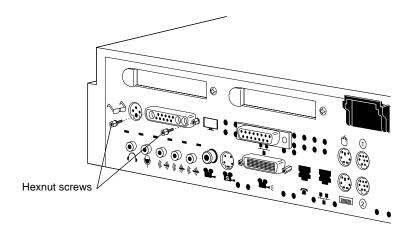


Figure 1-10 Removing the Hexnut Screws From the Rear Panel

- 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 a Phillips screwdriver to remove one screw from the graphics board.

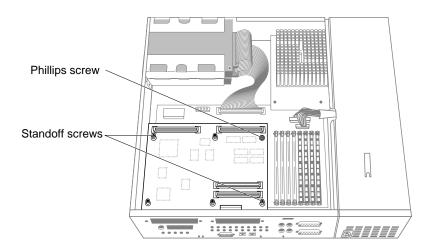


Figure 1-11 Removing the Screws From the Graphics Board

- 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 graphics board from the sockets on the system board.
 - Lift the graphics board up and remove it.

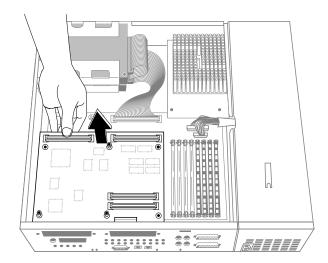


Figure 1-12 Disconnecting the Graphics Board From the System Board

You are now ready to replace the PROM chip.

Replacing the PROM Chip

If your PROM chip is dated before July 15, 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 PROM Chip Version" 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.

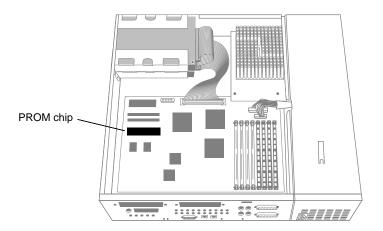


Figure 1-13 Locating the PROM Chip on the System Board

Before removing the PROM chip, familiarize yourself with it. Note that it has either a semicircular notch or a small, indented circle at the end facing the memory SIMMs. 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 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 1-14. 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.

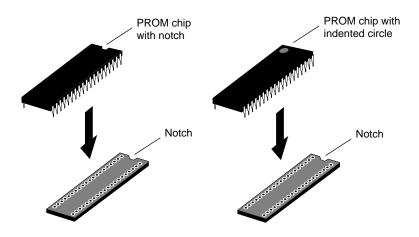


Figure 1-15 Lining Up the PROM Chip

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.

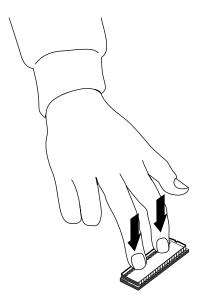


Figure 1-16 Pressing the PROM Chip Into the Socket

5. Visually check to make sure that 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 ready to replace the graphics board.

Replacing the Graphics Board

Follow these steps to replace the graphics board.

- 1. Position the graphics board over the system board, as shown in Figure 1-17.
 - Grasp the graphics board by the sides, with the two 96-pin male connectors on the underside.
 - Lower the graphics board over the system board, inserting the board's external I/O connector through the open slot on the rear of the workstation.
 - Loosely place the graphics board on top of the system board so that the two male connectors on the underside of the graphics board match the two female connectors on the system board.

Caution: The pins in the male connector are delicate. Gently wiggle or reposition the graphics 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 graphics board is sitting directly above a matching standoff (tall, hexagonal post) on the system board.

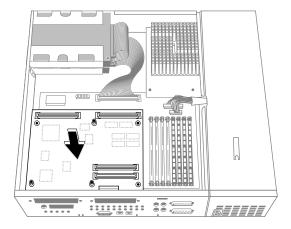


Figure 1-17 Positioning the Graphics Board Over the System Board

- 2. Press to seat the graphics board's connectors into the system board's connectors, as shown in Figure 1-18.
 - Place your fingers or thumbs on the graphics 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.

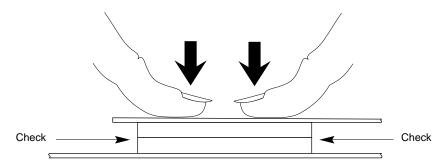


Figure 1-18 Seating the Graphics Board's Connectors

- 3. Verify that the graphics board is properly seated.
 - Look underneath the graphics board to see the two 96-pin connectors. Due to the other components on the graphics 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 1-18. Be sure to check each end of the connection.



Figure 1-19 Standoff Screw

- 4. Secure the graphics board with the following screws:
 - Using the open-ended wrench, insert and tighten the two standoff screws that you removed earlier (see Figure 1-19), in the locations shown in Figure 1-20. As you tighten the screws, alternate among them so that the board is fastened evenly.
 - Using the Phillips screwdriver, insert and tighten the Phillips screw on the graphics board, in the location shown in Figure 1-20.

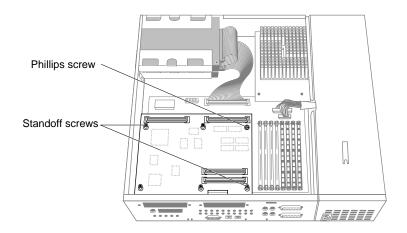


Figure 1-20 Inserting the Screws on the Graphics Board

- 5. Insert two hexnut screws through the rear of the workstation, as shown in Figure 1-21.
 - Insert the two hexnut screws you removed earlier on either side of the I/O connector.
 - Use the open-ended wrench provided with this package to tighten the two screws.

If the screw holes do not line up, make sure that the connectors are fully seated.

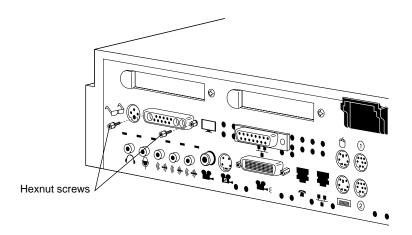


Figure 1-21 Replacing the Screws on the Backplane

You are now ready to install the Indy Presenter adapter board.

Installing the Indy Presenter Adapter Board

The Indy Presenter adapter board is a single-width GIO option board that you install on the Indy graphics board in the expansion slot closest to the SIMMs. (See Figure 1-22.)

If there is a GIO option board installed in this expansion slot, you should have already removed it. See "Removing the GIO Option Board" on page 8. Then return to this page.

Follow these steps to install the Indy Presenter adapter board.

 If there is a faceplate covering the GIO option port closest to the SIMMs, use the Phillips screwdriver to remove the screw and washer. (See Figure 1-22.) (If you removed a GIO option board earlier in this installation, there will be no faceplate to remove.)

Save the faceplate. If you remove the Indy Presenter adapter board in the future and do not replace it, you should reinstall the faceplate.

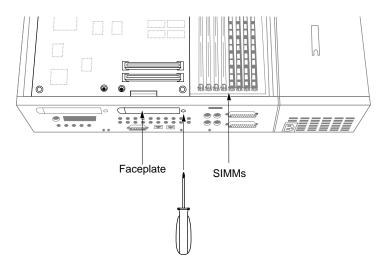


Figure 1-22 Removing the Faceplate From the GIO Option Port

2. Identify the Indy Presenter adapter board that came with this package. See Figure 1-23.

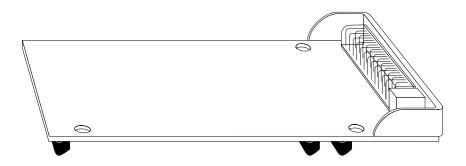


Figure 1-23 The Indy Presenter Adapter Board

- 3. Position the adapter board over the graphics board.
 - Grasp the adapter board by the sides, with the three male connectors on the underside, as shown in Figure 1-24.
 - Lower the adapter board over the graphics board, inserting the adapter's external I/O connector through the open slot on the rear of the chassis.
 - Loosely place the adapter board on top of the graphics board so that the three male connectors on the underside of the adapter board align with the three female connectors on the graphics board, as shown in Figure 1-24.
 - Check that each screw hole on the adapter board is aligned with a matching standoff (tall, hexagonal post) on the graphics board.

Caution: It may be difficult to align the connectors on the boards and to align the screwholes exactly over the standoffs. You may need to flex the back panel of the Indy while pushing the board gently toward the rear of the chassis. Note also that the pins in the male connectors are delicate. Gently wiggle or reposition the adapter 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.

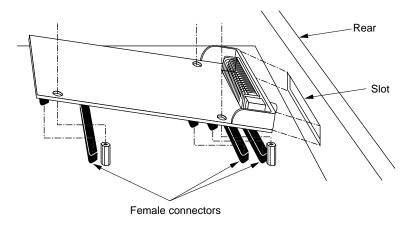


Figure 1-24 Positioning the Adapter Board Over the Graphics Board

- 4. Press to seat the adapter board's connectors into the graphics board's connectors, as shown in Figure 1-25.
 - Place your fingers or thumbs on the adapter board above where the connectors are located.
 - Press down gently but firmly until the three connectors fit snugly.

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

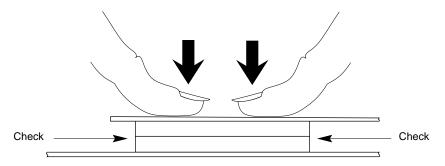


Figure 1-25 Seating the Adapter Board's Connectors

- 5. Verify that the adapter board is properly seated.
 - Look underneath the adapter board to see the three connectors. Due to the other components on the graphics 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 1-25. Be sure to check each end of the connection.

- 6. Secure the adapter board to the backplane, as shown in Figure 1-26.
 - Remove two Phillips screws from the plastic bag that comes with this package.
 - Using the Phillips screwdriver, insert and tighten the two screws in the locations shown in Figure 1-26.

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

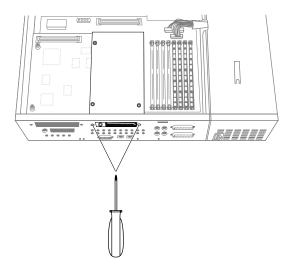


Figure 1-26 Inserting the Screws on the Rear Panel

- 7. Secure the adapter board to the graphics board as follows.
 - Remove three Phillips screws from the plastic bag that comes with this package.
 - Using the Phillips screwdriver, insert and tighten the three screws in the locations shown in Figure 1-27. As you tighten the screws, alternate among them so that the board is fastened evenly.

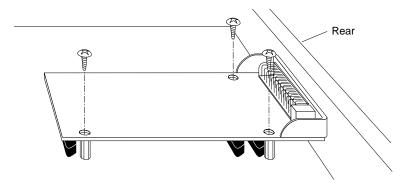


Figure 1-27 Securing the Adapter Board

- 8. Connect the small, black, audio cable that comes with this package as follows:
 - Connect one end to the adapter board's audio connector, as shown in Figure 1-28. (You can connect either end.).
 - Connect the other end to the line output connector on the rear of the Indy chassis.

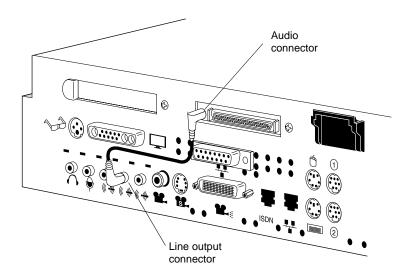


Figure 1-28 Connecting the Audio Cable

You are finished installing the Indy Presenter adapter board. Go to "Replacing the Top Cover and Connecting the Cables" on page 41.

Installing the Indy Presenter XZ Adapter Board

If your Indy workstation has the XZ graphics boardset, follow these instructions to install the Indy Presenter XZ adapter.

If you are not sure which graphics board your system has, follow these steps:

- 1. From the Desktop toolchest, select "Unix Shell."
- 2. From the Unix shell, type:

hinv

If you see "Graphics board: GR3-XZ," your system has the Indy XZ graphics boardset. Type <code>exit</code> to exit the shell and continue with these instructions. (If you see "Graphics Board: Indy 24-bit", or "Graphics Board: Indy 24-bit," your system has the Indy graphics board. Go to "Checking the PROM Chip Version" on page 3.)

Turning Off Your Indy Workstation

Turn off the power by pressing and releasing the power button on the front of the Indy, as shown in Figure 1-29. The system powers off automatically within the next minute.

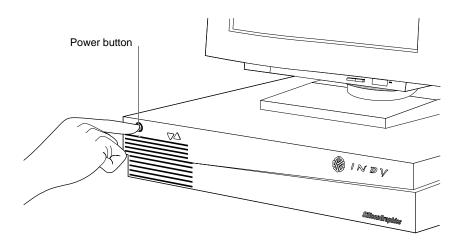


Figure 1-29 Turning Off the Indy Workstation

Removing the Top Cover

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

Caution: Your monitor is 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 against the lip at the back of the cover, and your second and third fingers under the finger ledge, as shown in Figure 1-30.
- 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, tilt it up, and remove it.

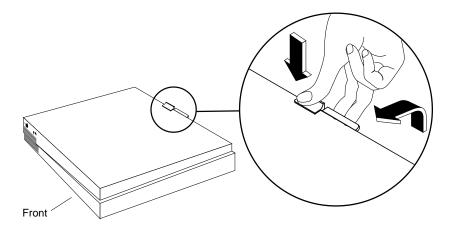


Figure 1-30 Removing the Top Cover

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:

- 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.

Installing the Board

1. Identify the Indy Presenter XZ adapter board. (See Figure 1-31.)

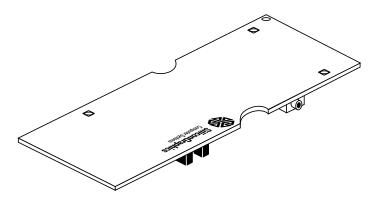


Figure 1-31 The Indy Presenter XZ Adapter Board

2. Using the Phillips screwdriver, remove the screw from the faceplate covering the GIO option port, as shown in Figure 1-32.

Save the faceplate. If you remove the Indy Presenter XZ adapter board in the future and do not replace it, you should reinstall the faceplate.

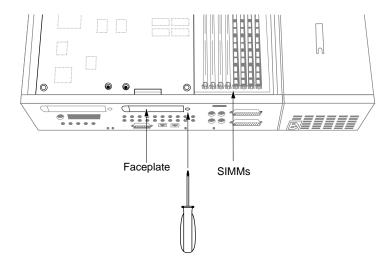


Figure 1-32 Removing the Faceplate From the GIO Option Port

- 3. Position the metal bracket, as shown in Figure 1-33.
 - Locate the metal bracket with a small, audio cable attached to it, included in this package.
 - Look for two dimples on the bracket. These will help you align the bracket over the GIO option slot.
 - On the inside of the chassis, position the bracket against the open slot, aligning the dimples, and pulling one end of the cable through the open slot. (See Figure 1-33.)
 - Make sure that the audio cable is *under* the metal extrusion on the bracket.

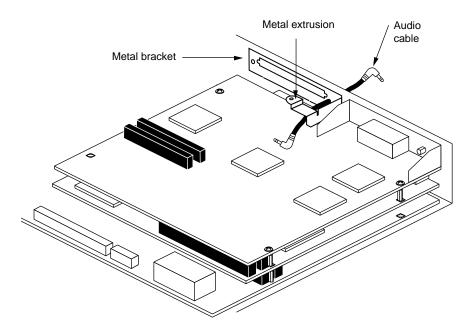


Figure 1-33 Installing the Metal Bracket

4. Secure the metal bracket to the chassis.

Caution: Choosing the correct screws for the next step may be confusing. In the plastic bag provided with the kit you'll find two types of Phillips screw—a long, thin one with a small diameter, and a short one with a larger diameter. Use the short ones for the next step.

- Remove two of the short Phillips screws from the plastic bag.
- Insert and tighten the two Phillips screws on the exterior of the bracket to hold it to the chassis. (See Figure 1-34.)

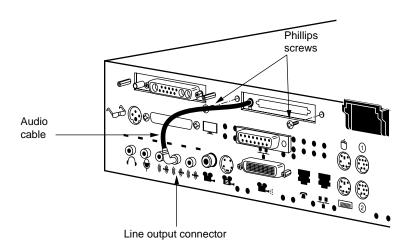


Figure 1-34 Inserting the Screws on the Exterior of the Bracket

5. Connect the external end of the audio cable to the line output connector on the rear of the Indy chassis, as shown in Figure 1-34.

- 6. Position the XZ adapter over the XZ graphics board.
 - Grasp the XZ adapter board by the sides, with the two male connectors on the underside, as shown in Figure 1-35.
 - Push the black audio cable aside so that it doesn't get caught under the board.
 - Loosely place the XZ adapter on top of the graphics board so that the two male connectors on the underside of the XZ adapter align with the two female connectors on the graphics board, as shown in Figure 1-35.

You may have to rock the XZ adapter from side to side horizontally to align the connectors.

Caution: The pins in the male connectors are delicate. Gently wiggle or reposition the adapter 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.

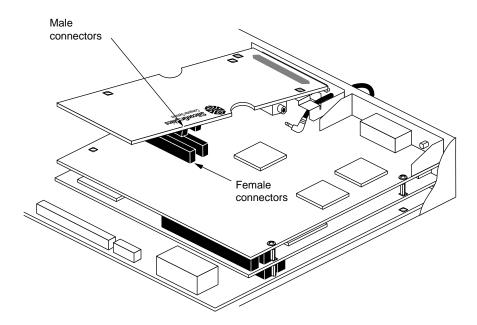


Figure 1-35 Positioning the Indy Presenter XZ Adapter Board

- 7. Press to seat the XZ adapter board's connectors into the graphics board's connectors.
 - Place your fingers or thumbs on the adapter 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 boards.

- 8. Verify that the XZ adapter board is properly seated.
 - Look underneath the XZ adapter board to see the two connectors. Due to the other components on the graphics board, it may be difficult to see the connectors. The male and female connectors must be touching along the entire shared surface. Be sure to check each end of the connection.

- 9. Connect the internal end of the audio cable to the audio port on the side of the XZ adapter board, as shown in Figure 1-36.
- 10. Secure the XZ adapter board to the graphics board, as shown in Figure 1-36.
 - Remove one short, large-diameter, Phillips screw from the plastic bag.
 - Insert and tighten the screw in the location shown in Figure 1-36.

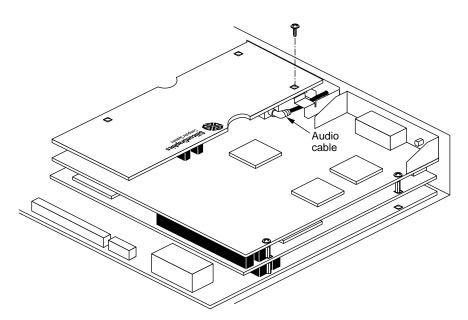


Figure 1-36 Inserting the Screws on the XZ Adapter Board

- 11. Secure the XZ adapter to the backplane, as shown in Figure 1-37.
 - Look in the plastic bag that comes with this package for two of the long, small-diameter, Phillips screws.
 - Using the Phillips screwdriver, insert and tighten one screw on either side of the connector, as shown in Figure 1-37.

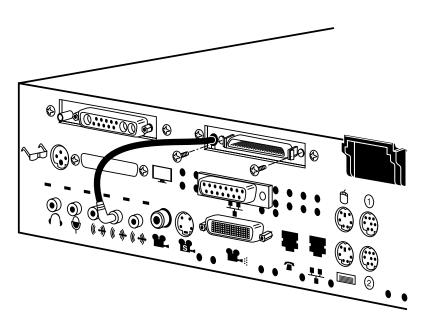


Figure 1-37 Attaching the External Screws

You are finished installing the Indy Presenter XZ adapter board and are ready to replace the 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 1-38.
- 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.

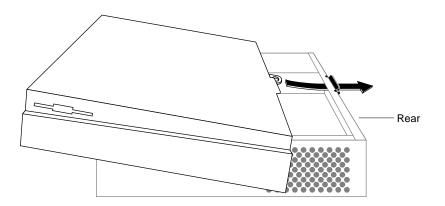


Figure 1-38 Replacing the Top Cover on the Indy Workstation

4. Reconnect the external cables you removed earlier. Be sure to connect the power cable. If you cannot remember where to reconnect the cables, refer to the *Indy Workstation Owner's Guide*.

You are finished installing the hardware and are ready to install the software.

Installing the Software

For instructions on installing the software, read the software release notes on the $\ensuremath{\mathsf{CD}}.$

Setting Up and Using the Indy Presenter

This chapter explains how to set up the Indy Presenter as a monitor for your Indy workstation, and how to use it on the customized Dukane overhead projector to project images on a screen. It also includes information on using the Indy Presenter software.

Setting Up the Indy Presenter

To set up the Indy Presenter with the Indy workstation, follow these steps.

- 1. Unpack the Presenter.
 - Lift the Indy 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 Indy Presenter from the plastic bag.
- 2. Remove the protective film from the screen, being careful not to get finger prints on the coated glass surface.

Caution: 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. Striking the surface with a hard object can break the glass.

- 3. Tilt the base of the Presenter to form a stand, as shown in Figure 2-1.
- 4. Place it on top of your Indy workstation.

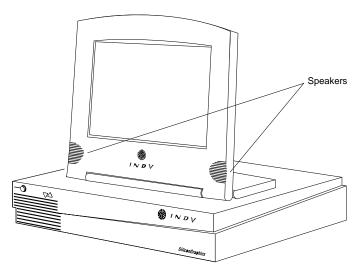


Figure 2-1 Placing the Indy Presenter on Top of the Indy Workstation

You are now ready to connect the external cables.

Connecting the Cables

There are two cables you must connect before using the Indy Presenter, the interface cable and the power cable.

Note: The Indy Presenter is not designed to work simultaneously with a CRT monitor. You can leave a CRT monitor connected to your Indy while using the Indy Presenter, but the image on the CRT monitor may be distorted, or there may be no image.

Follow these steps to connect the interface cable and the power cable.



Figure 2-2 Interface Cable Connector

1. Connect the interface cable to the Indy Presenter.

Caution: The connector has an elongated "D" shape, and you must orient it correctly. See Figure 2-2.

- Pick up the interface cable. It's the one with identical long, flat connectors at each end.
- Connect one end of the interface cable to the connector on base of the Indy Presenter, as shown in Figure 2-3. (You can connect either end of the cable.)

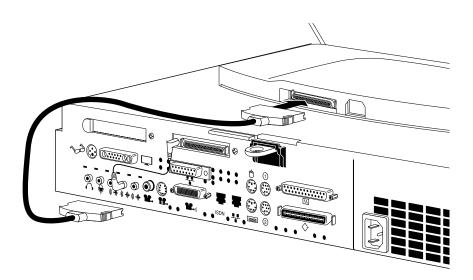


Figure 2-3 Connecting the Interface Cable to the Indy Presenter

2. Connect the other end of the interface cable to the rear of the Indy chassis. See Figure 2-4 for the Indy Presenter adapter. See Figure 2-5 for the Indy Presenter XZ adapter.

Caution: The connectors have an elongated "D" shape, and you must orient them correctly. Refer to the appropriate figure below for the adapter board you installed.

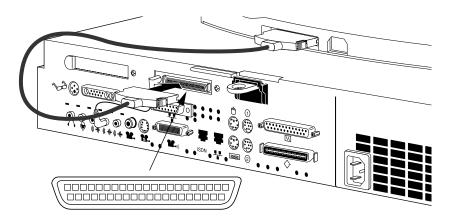


Figure 2-4 Connecting the Interface Cable: Indy Presenter Adapter

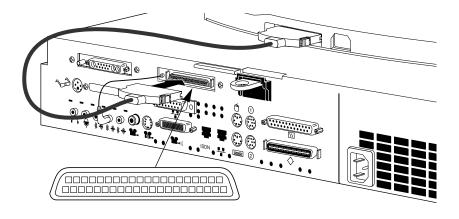


Figure 2-5 Connecting the Interface Cable: Indy Presenter XZ Adapter

- 3. Connect the power cable to the Indy Presenter and then to an electrical outlet, as shown in Figure 2-6. (Figure 2-6 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 Indy Presenter.
 - Connect the other end to a three-pronged grounded electrical wall outlet or power strip.

Note: The power supply for Indy 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).

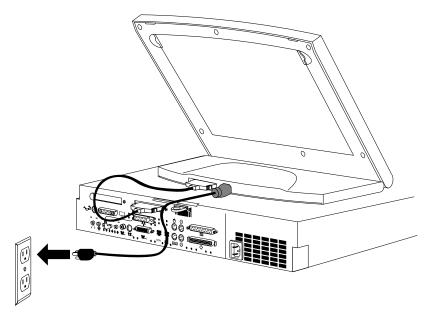


Figure 2-6 Connecting the Power Cable

You are now ready to turn on the Indy workstation and the Indy Presenter.

Using the Indy Presenter

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

Turning On the Indy Presenter

The Indy Presenter turns on automatically when you turn on the Indy workstation. The Indy Presenter takes about a minute to warm up, so the image may appear dim at first.

Note: If your Indy was already turned on when you connected the Indy Presenter, and you have a CRT monitor attached, you can turn on the Presenter by using the Monitor Control Panel. See "Using the Monitor Control Panel" on page 54.

Turn on the Indy workstation and the Indy Presenter by pressing and releasing the power button on the front of the system, as shown in Figure 2-7. You hear the boot "tune" as the system boots.

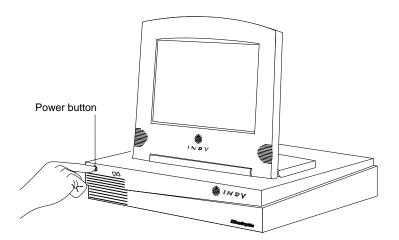


Figure 2-7 Turning On the Indy Workstation and the Indy Presenter

If the Indy 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.

Turning Off the Indy Presenter

The Indy Presenter turns off automatically when you turn off the Indy workstation. To turn off the Indy workstation, press and release the power button on the front of the Indy. If you prefer not to power down the Indy, and you have no CRT monitor connected, you can disconnect the Presenter's power and interface cables. To restart the Presenter, connect the two cables and reboot your Indy.

If you have a CRT monitor connected to your Indy, you can disconnect the Presenter's power and interface cables instead of powering down the Indy. To restart the Presenter, connect the two cables, open the Monitor Control Panel on the CRT monitor, and click the "Restart Presenter" button.

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 on the Dukane Customized Projector

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

Caution: Your Indy 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 Indy 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 Control Panel. See "Using the Indy Presenter Software" on page 54. Or press and release the power button on the front of the Indy workstation to turn on the Presenter and the workstation.
- 4. Bring up the image on the Indy Presenter display that you wish to project on the overhead projector.

- 5. Remove the backlight panel from the Indy Presenter. This automatically turns off the Presenter's backlight.
 - Place the Indy 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 2-8.
 - 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.

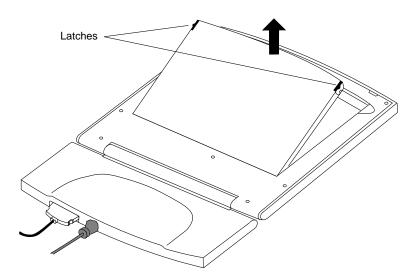


Figure 2-8 Removing the Backlight Panel

- 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 2-9.
 - Slide the Presenter under the two clips on the projector.
 - Rotate the base of the Presenter down so it is out of your way.

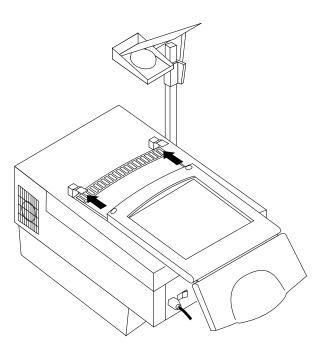


Figure 2-9 Placing the Presenter on the Overhead Projector

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 2-10.

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 Indy 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.

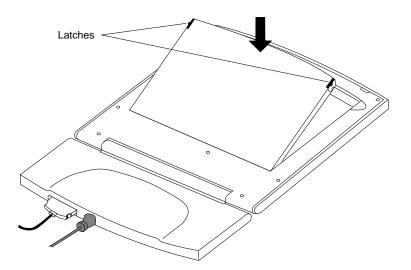


Figure 2-10 Replacing the Backlight Panel

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

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

Using the Indy Presenter Software

You can make adjustments to the Indy Presenter's image or audio through the Monitor Control Panel and the Audio Control Panel. To use the panels, you must have installed the software.

Using the Monitor Control Panel

The Monitor Control Panel contains labels and buttons that allow you to adjust the brightness, switch to 15-bit mode, turn on, or restart the Presenter.

To access the Monitor Control panel, follow these steps:

- 1. Log in to the workstation.
- 2. From the Find toolchest, choose "Icon Catalog" and select "Control Panels."
- 3. From the Control Panels page, double-click the *monpanel icon*.
- 4. Leave the Monitor Control Panel open and minimize it by clicking on the minimize button in the upper right hand corner of the panel. Or close the Monitor Control Panel by clicking the Close button in the lower right hand corner of the panel.

You can also access the Monitor Control Panel from a Unix shell by typing:

monpanel

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

Turning on the Indy Presenter

If you turned on your Indy workstation and later connected the Indy Presenter, and if you have a CRT monitor attached, you can start the Indy Presenter from the Monitor Control Panel. Follow these steps:

- 1. Open the Monitor Control Panel. (See "Using the Monitor Control Panel" on page 54.)
- 2. Click on the "Turn on Presenter" button.
- 3. 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.

- 4. Click on "Continue" to turn on the Presenter.
- 5. Close the Monitor Control Panel by clicking the Close button in the lower right hand corner of the panel.

Restarting the Indy Presenter

If the Indy Presenter is disconnected from the Indy after the Indy workstation and Presenter are turned on, you can reconnect the Presenter and restart it from the Monitor Control Panel. Note that restarting the Presenter resets the backlight and bit mode to their original settings, that is, full backlight and 12-bit mode.

Follow these steps:

- 1. Open the Monitor Control Panel. (See "Using the Monitor Control Panel" on page 54.)
- 2. Click the "Restart Presenter" button.
- 3. Close the Monitor Control Panel by clicking the Close button in the lower right hand corner of the panel.

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

Adjusting the Brightness

You can control the brightness on the Indy Presenter with the Monitor Control Panel.

Follow these steps to adjust the brightness of the display:

- 1. Open the Monitor Control Panel. (See "Using the Monitor Control Panel" on page 54 above.)
- 2. Move the slider to adjust the brightness of the display.
- 3. Close the Monitor Control Panel by clicking the Close button in the lower right hand corner of the panel.

Switching to 15-Bit Mode

The default color mode on the Indy 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, log in and use the Monitor Control Panel. Follow these steps:

- 1. Open the Monitor Control Panel. (See "Using the Monitor Control Panel" on page 54.)
- 2. Click the 15-bit mode button.
- 3. Close the Monitor Control Panel by clicking the Close button in the lower right hand corner of the panel.

Using the Audio Control Panel

The Audio Control Panel contains buttons and panels that allow you to make adjustments to the audio of the Indy Presenter.

To access the Audio Control Panel, follow these steps:

- 1. Log in to the workstation.
- From the Find toolchest, choose "Icon Catalog" and select "Control Panels."
- 3. From the Control Panels page, double-click the *apanel icon*.

4. Leave the Audio Control Panel open and minimize it by clicking on the minimize button in the upper right hand corner of the panel. Or close the Audio Control Panel by clicking the Close button in the lower right hand corner of the panel.

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

apanel

For further information on the Audio Control Panel:

- Select "On-line Books" from the Help toolchest. Choose "Media Tools User's Guide" and search for "Audio Control Panel."
- From a shell window, type man apanel to see the reference page (man page).

Adjusting the Volume and Tone of the Speakers

The Indy Presenter speakers are designed to work with the standard Indy speaker. You adjust the volume and tone of the Presenter stereo speakers through the Audio Control Panel.

Follow these steps to adjust the volume and tone:

- 1. Open the Audio Control Panel. (See "Using the Audio Control Panel" on page 56.)
- 2. From the Options menu, choose "Presenter Audio."
- 3. Adjust the speaker mix using the Indy Presenter Speaker controls on the Presenter Audio panel.
- 4. Adjust the tone by moving the tone control slider on the right of the panel.
 - Note that while the Presenter Audio Panel is running, you can use the volume controls on the front panel of the Indy to control the volume. Or you can adjust the volume of the Indy Presenter speakers independently of the Indy speakers by selecting "Output Sliders Independent" from the Audio Panel Options menu.
- 5. To mute the Indy Presenter speakers, click the Mute button on the Presenter Audio Panel.

6. Close the Audio Control Panel by clicking the Close button in the lower right hand corner of the panel.

Using Headphones

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

- 1. Open the Audio Control Panel. (See "Using the Audio Control Panel" on page 56.)
- 2. Select "Presenter Audio" from the Options menu.
- Click the *Mute* button on the Presenter Audio panel.
 Note that clicking the Mute button on the main Audio Panel mutes only the Indy speakers, and not the Presenter speakers.
- 4. Close the Monitor Control Panel by clicking the Close button in the lower right hand corner of the panel.

Transporting the Indy Presenter

To take the Indy Presenter with you when you travel, Silicon Graphics recommends that you use the IndybagTM carrying case. This is a soft-sided carrier in which you can pack both the Indy workstation and the Presenter. The carrying case is intended as *carry-on baggage*, to store in an airplane's overhead compartment. *Do not check it in as baggage*. The display is made of glass and may break if checked in as baggage.

Note: To return the Presenter to Silicon Graphics, do not use the Indybag. Use the original cardboard shipping container. See "Returning the Presenter to Silicon Graphics" on page 71.

To pack the Presenter in the Indybag, follow these steps:

- 1. Turn off the Indy workstation by pressing and releasing the power button on the front of the system. The Indy Presenter turns off automatically.
- 2. Disconnect the power cable from the Presenter and from the wall outlet.

- Disconnect the interface cable from the Presenter and from the Indy workstation.
- 4. Rotate the base so it is parallel with the monitor, as shown in Figure 2-11.

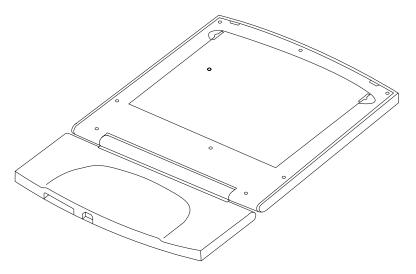


Figure 2-11 Rotating the Base for Packing the Indy Presenter

- 5. Place the Indy Presenter in the reinforced sleeve inside the Indybag carrying case. (The Indy workstation is in the main compartment.)
- 6. Place the two cables in the side pocket of the Indybag.
- 7. Zip up the Indybag and you are ready to go!

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, we recommend 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.

Cleaning and General Care of the Indy Presenter

Handle your Indy 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 below to clean the display, using the cleaning kit provided with the Indy Presenter.

Caution: It's important that you use 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 Indy 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 Indy Presenter gently with the cloth.
- 3. Remove the backlight panel, if it's not already removed.
 - Place the Indy 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 Indy 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 Indy's screen saver program when using the Presenter. As with any CRT monitor, leaving an image up for long periods of time 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 Indy Presenter.

Common Problems

If you think there may be a problem with your Indy 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 Indy Presenter

- Make sure that the Indy workstation is turned on. There is no on/off switch on the Indy Presenter. If the Indy Presenter cables are connected properly, the Indy Presenter powers up automatically when you turn on the Indy 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 Indy Presenter and to a working wall outlet or power strip.
- 4. Check that the interface cable is connected securely to the Indy Presenter and to the correct connector on the rear of the Indy workstation. (See "Connecting the Cables" on page 44.)

If either step 3 or step 4 was the problem, and you have a CRT monitor connected, you can use the Monitor Control Panel to restart the Presenter. (Choose "Icon Catalog" from the Find toolchest, and select "Control Panels," and double-click the *monpanel* icon.) Otherwise, restart the Indy 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

- 1. 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.
- 2. 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.

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 will 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 Control 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 Indy 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 which you should plan on replacing after 750 hours of use.

If you think this is the problem, contact Dukane directly. To have the bulb replaced by a Dukane service center near you, call Dukane toll-free at 1-800-676-2487 or 708-584-2300 extension 356 in the United States. Or send a fax to Dukane at 708-584-0984 in the United States. For Dukane international service, call 352-66-17-82 in Luxembourg, or send a fax to 352-67-64-60.

No Sound From the Stereo Speakers

- Check that you have installed the small, black, audio cable correctly. (See Figure 1-28 if your Indy has Indy Graphics, or Figure 1-34 if your Indy has Indy XZ graphics.)
- 2. The stereo speakers may have been muted in order to use headphones. To turn on the speakers, choose "Icon Catalog" from the Find toolchest, and select "Control Panels." From the Control Panels page, 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 Indy Presenter

If, after following the suggestions in the previous sections, you still believe there is a problem with the Indy 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.

Removing the Indy 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, follow these steps to remove the adapter board from the Indy workstation.

1. Remove the small, black, audio cable from the rear of the Indy workstation. (See Figure 3-1.)

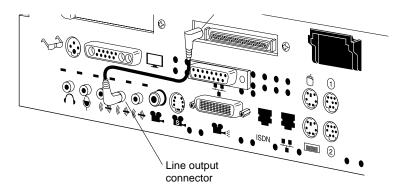


Figure 3-1 Removing the Audio Cable

2. Using a Phillips screwdriver, remove the two screws from the board's external connector, as shown in Figure 3-2.

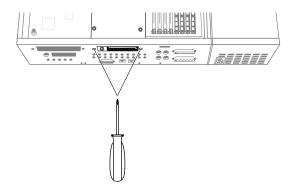


Figure 3-2 Removing the External Screws

3. Using a Phillips screwdriver, remove the three Phillips screws that connect the adapter board to the graphics board, as shown in Figure 3-3.

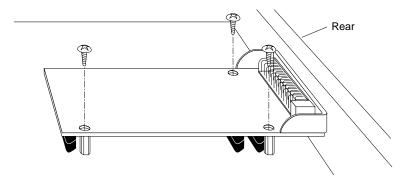


Figure 3-3 Removing the Screws from the Adapter Board

- 4. Disconnect the adapter board from the graphics board by grasping the board firmly and pulling it up.
- 5. Install the replacement board following the instructions in "Installing the Indy Presenter Adapter Board" on page 23.

Removing the Indy Presenter XZ Adapter Board

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

- 1. Disconnect the small, black, audio cable from the input/output connector on the rear of the Indy chassis, as shown in Figure 3-4.
- 2. Using a Phillips screwdriver, remove the two external screws from the connector, as shown in Figure 3-4.

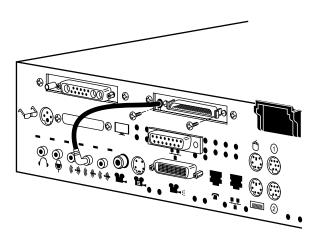


Figure 3-4 Removing the Audio Cable and the External Screws

- 3. Disconnect the internal end of the audio cable from the XZ adapter board. (See Figure 3-5.)
- 4. Using a Phillips screwdriver, remove the screw that secures the XZ adapter board to the XZ graphics board, as shown in Figure 3-5.

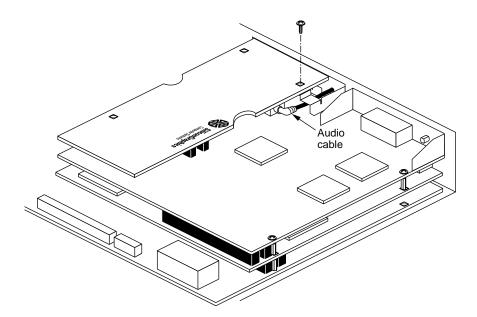


Figure 3-5 Removing the Screw from the XZ Adapter Board

- 5. Disconnect the XZ adapter board from the XZ graphics board by grasping the adapter board firmly and pulling it up.
- 6. Using a Phillips screwdriver, remove the two external screws that hold the metal bracket and audio cable to the chassis.
- 7. Remove the metal bracket, and keep it in a safe place. You'll need to reinstall it when installing the replacement board.
- 8. Install the replacement board, following the instructions in "Installing the Indy Presenter XZ Adapter Board" on page 30.

Returning the Presenter to Silicon Graphics

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

- 1. Turn off the Indy Presenter by pressing and releasing the power button on the front of the Indy workstation.
- 2. Disconnect the power cable and interface cable from the rear of the Presenter.
- 3. Complete the "Part Request Form" from the last page of this manual.
- 4. Pack the Presenter and the "Part Request Form" in the original shipping carton.
- 5. 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 Indy Presenter liquid crystal display.

Table 4-1 Technical Specifications for the Indy Presenter

| Electro-Optical | 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 ² 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 | |
| Video | Interface to Indy | Single-width GIO option board connects to the Indy 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 Indy Presenter

| Audio | Interface to Indy | Analog stereo |
|-----------------------------|--------------------------|--|
| | Output | Stereo, .6 W per channel, 150 Hz to 18 KHz (used with Indy speaker) |
| | Control | I ² C interface to control speaker volume, backlight brightness, tone, and stereo balance |
| | Master volume control | Audio control buttons on front panel of Indy control volume of Indy Presenter speakers as well as Indy speaker |
| Power Requirements | Power | 30 watts AC plus 10 watts @ 5 VDC for Indy Presenter Adapter Board |
| | Source | 110/220 VAC 50-60 Hz |
| Cabling | 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 |
| Physical Characteristics | Size | Display: 12 3/4"H x 12 1/2"W x 7/8"D. |
| | | Base: 6 1/2H" 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 Indy Dukane Overhead Projector |

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

| Physical Characteristics | Desktop use | Integral base supports desktop use at 0° to -30° tilt |
|-----------------------------|-------------------|--|
| Operating Conditions | Temperature | +13°C to +35°C in direct view and overhead projector modes |
| | Relative humidity | 10% to 80% RH, no condensation |
| Non-Operating Conditions | 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 Indy 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.

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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 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.

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.

About Liquid Crystal Display (LCD) 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 sub-pixel 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 which 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 sub-pixel 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 sub-pixel 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 sub-pixel. You can actually see these red, green and blue sub-pixels 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 only see them if you have a solid background and are using the Presenter as a desktop monitor. The streaks are normal in LCD technology. If they becomes 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 1024×768 pixels. Therefore there are $1024 \times RGB \times 768$, or 2,259,296, sub-pixels in your display — 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 sub-pixel 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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