Indigo² IMPACT™ Workstation Owner's Guide

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Chapter 1

Introduction

This chapter explains where to find the information you need to set up and use your Indigo^2 IMPACT workstation. It explains when to use this manual, and when to use the online documentation and help.

Introduction

Welcome to the Indigo^2 IMPACT™ workstation. The *Indigo^2 IMPACT Workstation Owner's Guide* is your complete guide to installing, diagnosing, and repairing your Indigo^2 IMPACT workstation. Specifically, it tells you how to

- set up your Indigo^2 IMPACT workstation and turn it on

- install and remove single inline memory modules (SIMMs)

- install and remove option (EISA and GIO) boards

- install peripherals

- install and remove software

- diagnose hardware problems

- replace faulty parts

- correctly maintain your workstation

Refer to this guide to set up the system, install hardware options, or find a solution when you suspect there is a hardware problem. Basic information on installing software is also included. For more advanced information on installing software, see the online *Personal System Administration Guide*.

The system and all the procedures in this guide are designed so that you may maintain and repair the system without the help of a trained technician. However, do not feel that you *must* work with the hardware yourself. You can always contact your service provider to have an authorized customer service personnel work with the hardware instead.

Finding the Information You Need

The Indigo^2 IMPACT workstation ships with the following sources of information, as shown in Figure 1-1.

- *Indigo^2 IMPACT Workstation Owner's Guide* and pictorial setup poster

- *Software Installation Administrator's Guide*

- *Release Notes* (on the CD)

- *IRIS InSight™* online documentation and help
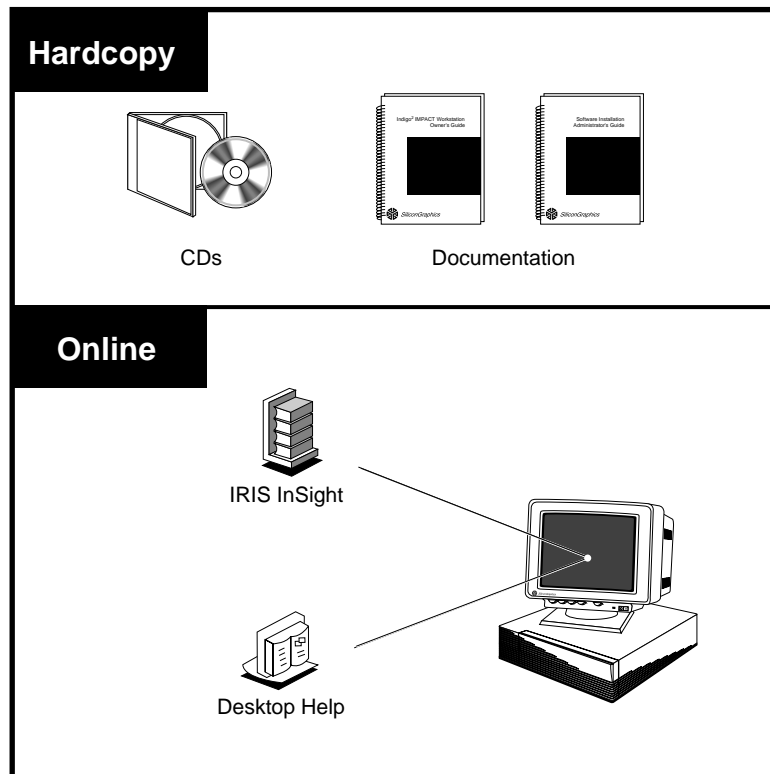
Figure 1-1   Sources of Information About the Indigo^2 IMPACT Workstation

The following documentation can help you get your workstation up and running and help you become productive as soon as possible.

Figure 1-2
Workstation
Owner's Guide

Indigo² IMPACT Workstation Owner's Guide

Refer to this manual (shown in Figure 1-2) to set up the system and install hardware options, or find solutions when you suspect there is a hardware problem. In addition, it contains basic information on installing and removing optional software.

Software Installation Administrator's Guide

Figure 1-3
Software
Installation Guide

The *Software Installation Administrator's Guide* (shown in Figure 1-3) is the complete reference guide on using the installation program *Inst* to install software. For information on using the Software Manager to install software, refer to the online *Personal System Administration Guide.*

IRIS InSight Online Documentation and Help
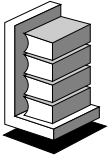
Figure 1-4
IRIS InSight Icon

The online documentation package is called IRIS InSight. The InSight icon is shown in Figure 1-4. To view the manuals, go to the Help toolchest and choose "Online Books." You see bookshelves for end-user, developer, and administration manuals that ship online with the system. Double-click a book icon to open it.

For a description of the manuals and a listing of manuals that are available to purchase in hard copy, double-click the *Documentation Catalog*.

Conventions

This manual uses these conventions:

- References to other documents are in *italics*.

- Names of menu choices and references to other chapters and sections within this guide are in quotation marks.

- Names of buttons are in *italics*.

- Numbered sentences are steps that you follow to complete a task. Below a step, sentences preceded by a box describe in detail how to do the step. For example:

1. Remove the front cover.

    - Face the front of the Indigo^2 IMPACT workstation.

    - Snap the cover away from the top edge of the chassis and tip it down.

Where to Go From Here

To set up the Indigo^2 IMPACT workstation, go to Chapter 2, "Getting Started." This chapter tells you how to choose a site, put all the pieces together, turn the system on, and set up your login account and network connection software.

For a visual overview of the back of the chassis and interior of the workstation, see Appendix C, "Exterior and Interior of Workstation."

To install extra SIMMs, go to Chapter 3, "Installing and Removing Memory."

To install option (GIO and EISA) boards, go to Chapter 4, "Installing and Removing Standalone Option Boards."

To install graphics boards, and upgrade from and IMPACT Ready Indigo^2 to an Indigo^2 IMPACT, go to Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards."

To upgrade from an IMPACT Ready Indigo^2 to an Indigo^2 IMPACT, go to Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards."

To install peripherals, go to Chapter 6, "Installing and Removing Peripherals: Internal and External Devices." This chapter tells you how to install internal and external drives, serial devices, and audio peripherals. You'll also learn which modems, printers, and other cables you can use with your Indigo^2 IMPACT workstation.

To install Silicon Graphics$^{®}$ software, go to Chapter 7, "Installing and Removing Software."

If you have a problem while powering on or using your Indigo^2 IMPACT workstation, go to Chapter 8, "Troubleshooting."

To order and replace parts, see Chapter 9, "Ordering, Removing, and Installing Replacement Parts."

For information on maintenance and some tips on making your work environment comfortable, see Chapter 10, "Maintenance, Safety, and Regulatory Information."

For regulatory information, go to Chapter 10, "Maintenance, Safety, and Regulatory Information" and see your Declaration of Conformity.

In addition to this manual, the Indigo^2 IMPACT workstation ships with an online documentation package called IRIS InSight. To open IRIS InSight, choose "Online Books" from the Help toolchest.

Getting Started

This chapter explains how to connect the parts of your Indigo^2 IMPACT workstation, turn the system on, log in, and set yourself up on a network. It also explains how to use the Indigo Magic User Environment.

Getting Started

This chapter tells you how to set up your Indigo^2 IMPACT workstation. It includes instructions on

- selecting a site
- checking your shipment
- putting all the pieces together
- turning on your system
- creating your login account
- setting up your network software
- shutting down and turning off your system
- locking your workstation

If you've already set up your Indigo^2 IMPACT workstation and want to learn how to use the IRIX system software, go to "Using the Indigo Magic User Environment" on page 35.

If you want to mechanically secure your workstation, follow the instructions in "Locking Your Indigo^2 IMPACT Workstation" on page 43.

Selecting a Site

Indigo^2 IMPACT is designed to sit on or beside your desk. The monitor fits easily on top of the workstation. If you prefer to keep the workstation on the floor, you can attach the workstation stand that shipped with your Indigo^2 IMPACT workstation and set the workstation beside your desk.

Install any internal drives or memory first, before placing your monitor on top of the workstation or placing the workstation beside your desk.

Select a site using these suggestions:

- Place Indigo^2 IMPACT and the monitor within 6 feet of each other; you'll connect them with cables that are 10 feet long.

- Place Indigo^2 IMPACT within 8 feet of a standard three-pronged (grounded) electrical outlet.

- Do not place Indigo^2 IMPACT within a small, enclosed area, such as a closet, or it may overheat. Do not block the vents.

Checking Your Shipment

The Indigo^2 IMPACT workstation is shipped with the pieces shown in Figure 2-1. If you ordered extra memory or internal drives, they will be in separate boxes.

A fold-out poster ships in the box that contains the Indigo^2 IMPACT chassis. This poster has pictorial instructions on how to unpack and set up the workstation. You can use the poster to set up your Indigo^2 IMPACT or, if you prefer, you can follow the step-by-step instructions in this chapter.

After you unpack your Indigo^2 IMPACT workstation and its parts, make sure you have all the parts shown in Figure 2-1.
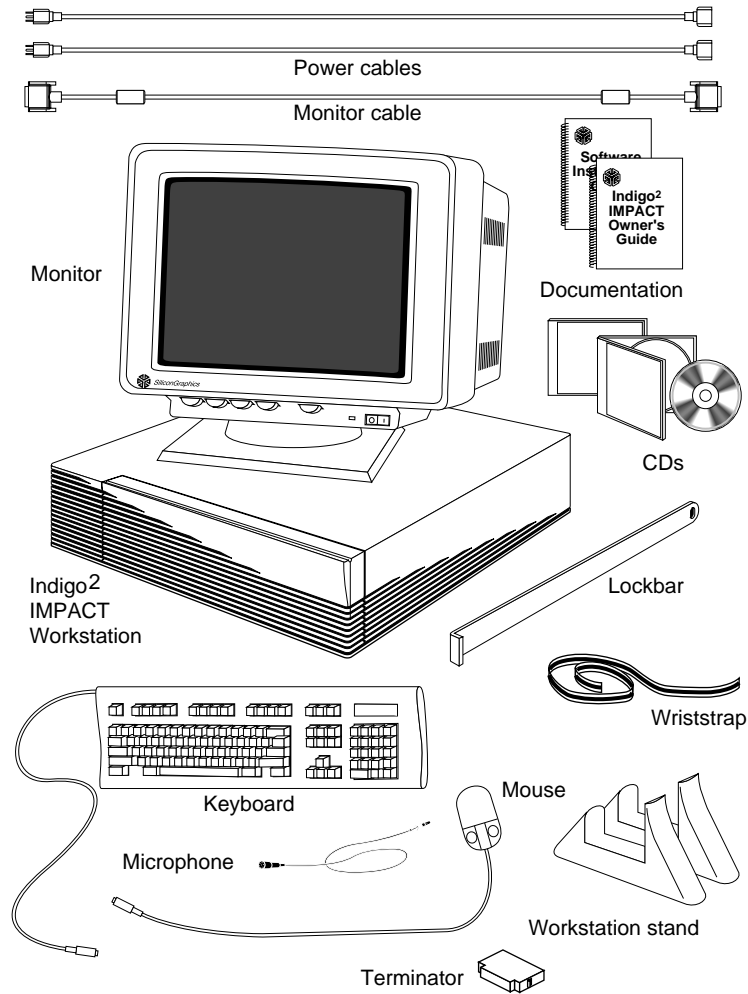
Figure 2-1   Indigo^2 IMPACT Parts

If your site has multiple Indigo^2 IMPACT workstations, it's a good idea to save at least one set of packing materials in the event that you need to return a system for upgrading or for service.

Learning About the CD Software Media

You received one or more compact discs (CDs) with your Indigo^2 IMPACT workstation. The CDs include optional software that you might find useful, and a copy of the operating system and software installation tools that are already on your system disk. You don't need the compact discs to set up and use your system. Store them in a safe and convenient place so you can find them if you need to install new software, or if the system fails.

Note: Not all the software on these CDs is pre-installed on your system disk.

For more information on installing software, refer to Chapter 6, "Installing and Removing Peripherals: Internal and External Devices."

Putting the Pieces Together

Place the monitor next to the Indigo^2 IMPACT workstation, near the site you selected, then follow the instructions in the next sections to

- install any internal drives

- install optional memory (turn to Chapter 3, "Installing and Removing Memory," for instructions)

- install any option boards (turn to Chapter 4, "Installing and Removing Standalone Option Boards")

- set up the system

- attach the monitor, keyboard, mouse, and microphone to the workstation

- attach the Ethernet cable if you will be attaching your system to a network

- attach the SCSI terminator if you are not using this port

- attach the power cables to the workstation and monitor

- turn on your workstation and create your login account

For tips on keeping your hardware and software in good running order, see Chapter 10, "Maintenance, Safety, and Regulatory Information."

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Installing Any Internal Drives and Additional Memory

If you are running your Indigo^2 IMPACT as a diskless system or if you do not need to install an internal drive or memory, turn to "Setting Up the Workstation" on page 19.

If you need to install or reconfigure memory, turn to Chapter 3, "Installing and Removing Memory," for instructions.

If you need to install other internal drives, follow the steps below.

1. Open the front cover of the Indigo^2 IMPACT workstation.

    ■   Face the front of the Indigo^2 IMPACT workstation.

    ■   Snap the cover away from the top edge of the chassis and tip it down, as shown in Figure 2-2.
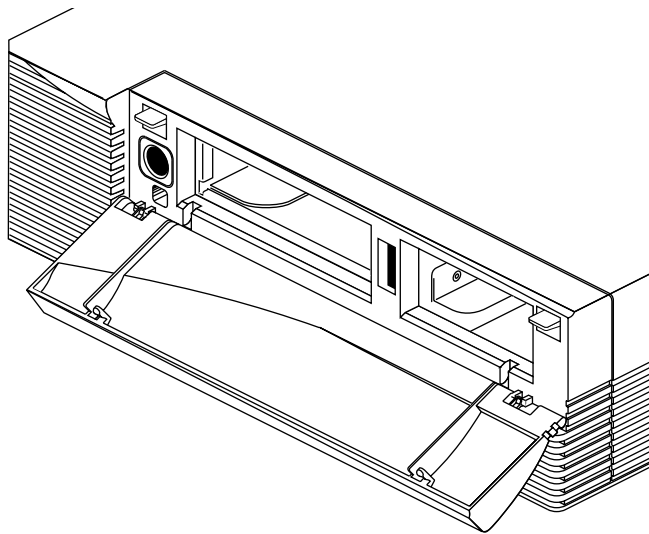
Figure 2-2   Opening the Front Cover

2. Remove the bezel.

    ■   Press down on the tabs on each side of the bezel, as shown in Figure 2-3.
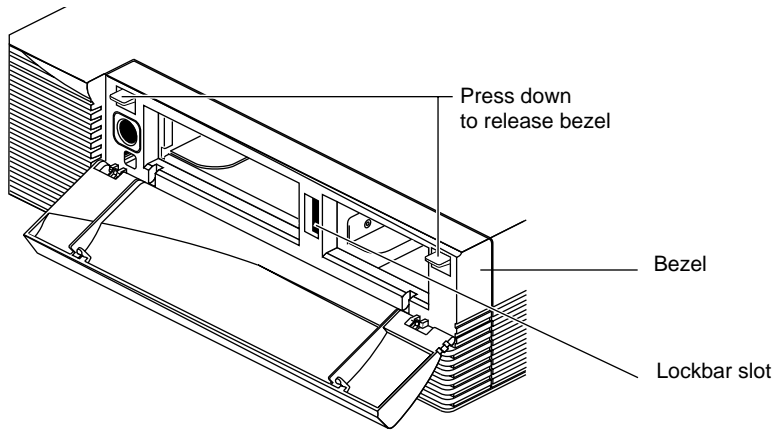
Figure 2-3   Releasing the Bezel

    ■   Pull the bezel down and away from the chassis.
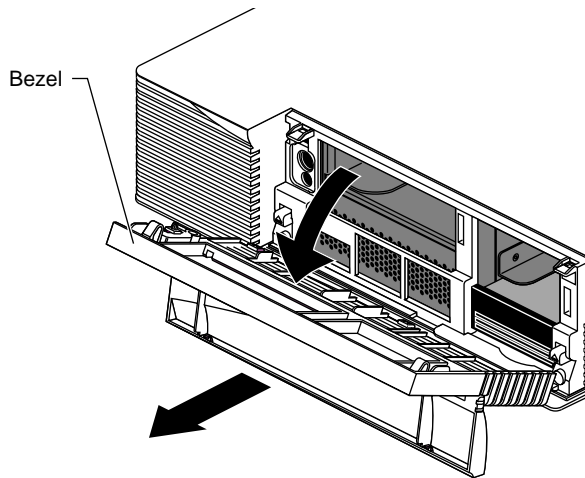
Figure 2-4   Removing the Bezel

3. Install any internal option drives.

An internal option drive is any drive other than the system disk. Option drives include floppy drives, floptical drives, secondary hard disk drives, QIC tape drives, CD-ROM drives, or DAT drives.

■ You can install a secondary hard disk, a floppy drive, a floptical drive, or DAT drive in the 3-1/2" drive slot above the system drive slot. You can install a QIC tape drive, a 3-1/2 x 1-6/10" hard disk drive, or a CD-ROM drive in the 5-1/4" drive slot to the left.

■ Pick up the drive so the lever is facing you and is on the bottom of the drive.

■ Slide the drive into the slot, making sure that the guides underneath the drive line up with the guides in the Indigo^2 IMPACT chassis. As you slide the drive in, the lever moves to the right.

■ Push the drive in firmly until you feel solid resistance.

■ Push the lever all the way to the right. This locks the drive in place. The lever should be flush with the front of the drive.
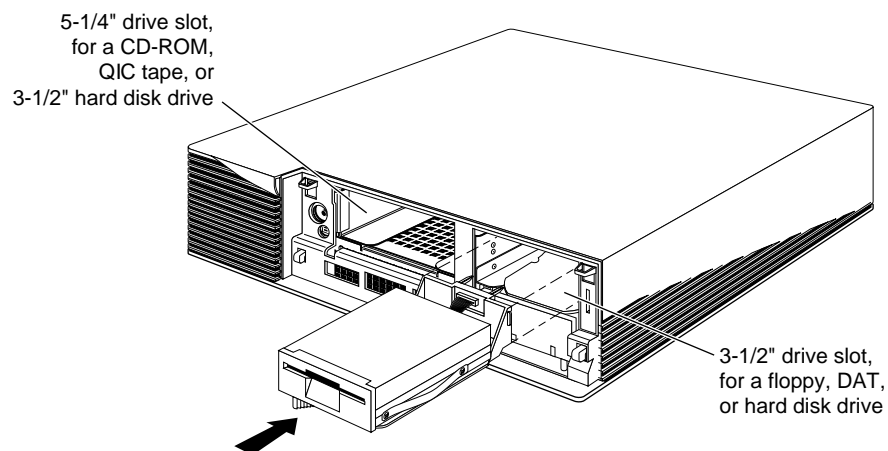
Figure 2-5   Installing an Option Drive

4. Replace the bezel.

    ■   Place the tabs on the bottom of the cover in the grooves in the front of the
        chassis, as shown in Figure 2-6.

    ■   Tilt the bezel up until it snaps into place.
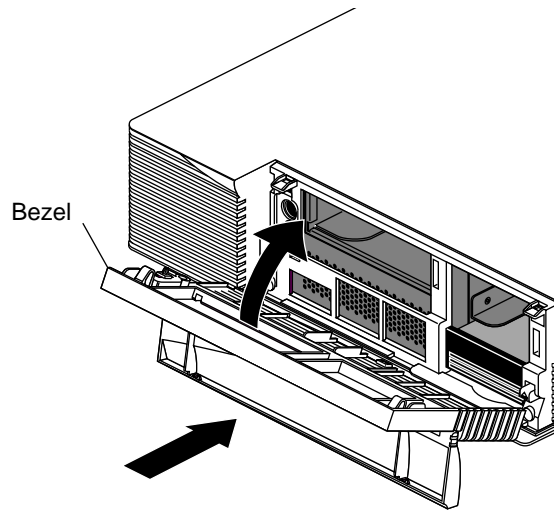
Bezel

Figure 2-6   Replacing the Bezel

You are finished installing the drives and are ready to set up the workstation.

Setting Up the Workstation

To set up your workstation ergonomically, see Chapter 10, "Human Factors Guidelines for Setting Up Your Indigo2 IMPACT Workstation," on page 300.

You can position your workstation on the floor in its workstation stand, or under your monitor.

To place your Indigo^2 IMPACT workstation on the floor in its workstation stand, follow these steps:

1. Face the front of the workstation.

2. Push the workstation so the left side is hanging off the edge of your work surface.

3. Look at the underside of the workstation. You see guides for the workstation stand, as shown in Figure 2-7.

4. Press each piece of the stand onto the workstation, aligning the pieces with the guides.
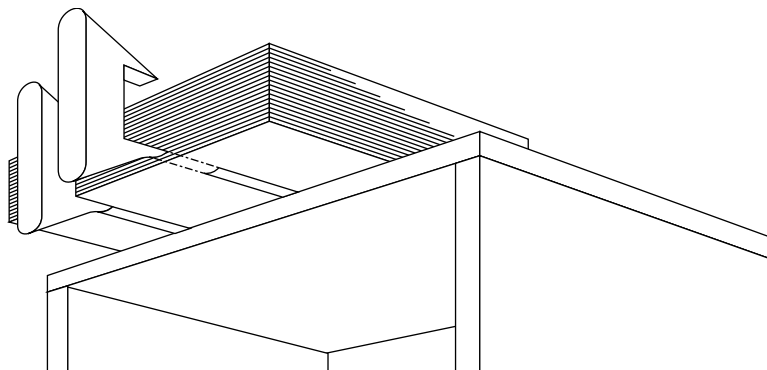
Figure 2-7   Attaching the Workstation Stand to the Workstation

5. Tip the workstation down onto the floor so that it rests on the stand. Place it under or beside your desk or workspace, as shown in Figure 2-8.
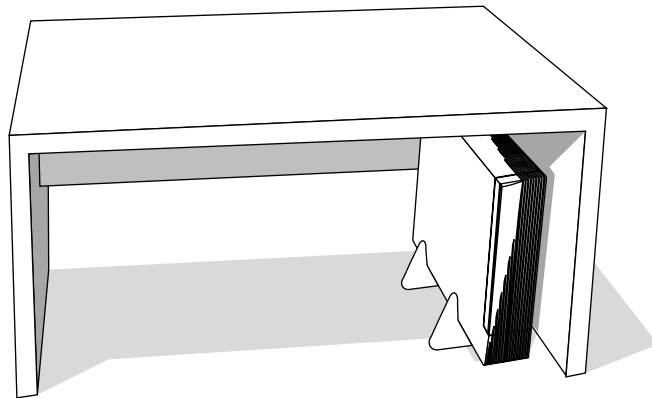
Figure 2-8   Placing Your Workstation Under Your Desk

To place your monitor on your workstation, see Figure 2-9.
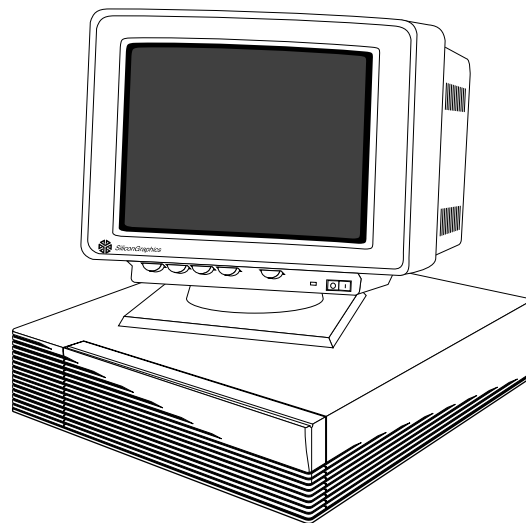
Figure 2-9   Placing the Monitor on Top of Your Indigo^2 IMPACT Workstation

Connecting the Monitor, Keyboard, Mouse, and Microphone

To connect the monitor, keyboard, mouse, and microphone to the Indigo^2 IMPACT workstation, follow these steps:

1. Connect the monitor cable to the monitor and the Indigo^2 IMPACT workstation.

    ■   Connect one end of the cable to the connector on the back of the monitor, as shown in Figure 2-10. Screw in the thumbscrews on both sides of the connector.

    ■   Connect the other end of the cable to the graphics board connector on the back of the Indigo^2 IMPACT workstation, as shown in Figure 2-10. Screw in the thumbscrews on both sides of the connector.
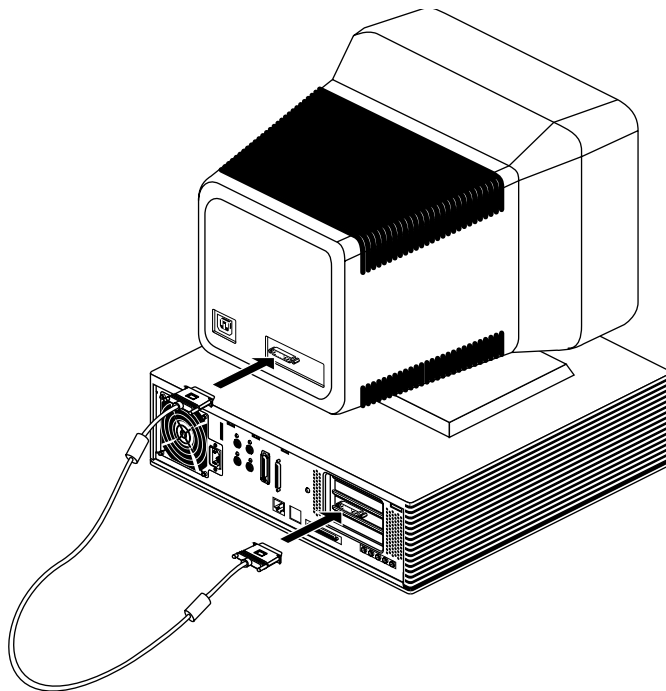
Figure 2-10   Connecting the Monitor Cable to the Indigo^2 IMPACT Workstation

2. Connect the keyboard cable to the connector below the keyboard icon on the back of the Indigo^2 IMPACT workstation, as shown in Figure 2-11.
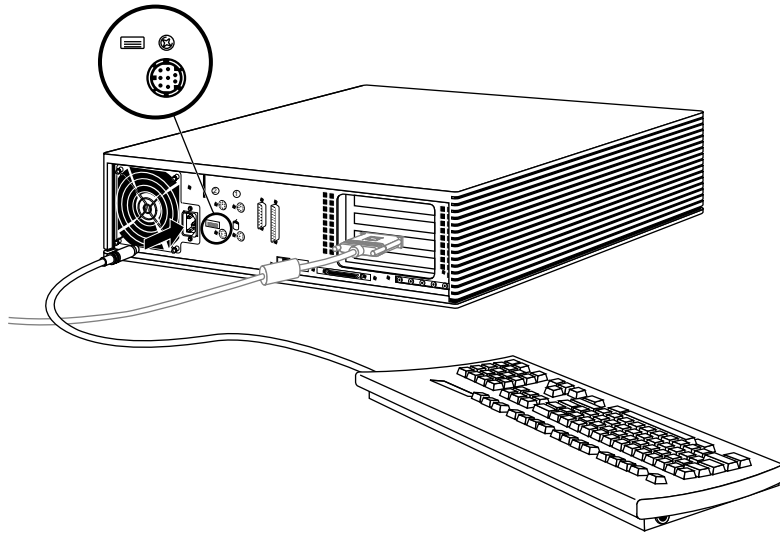
Figure 2-11   Connecting the Keyboard Cable

3. Connect the mouse cable to the connector below the mouse icon on the back of the Indigo^2 IMPACT workstation, as shown in Figure 2-12.
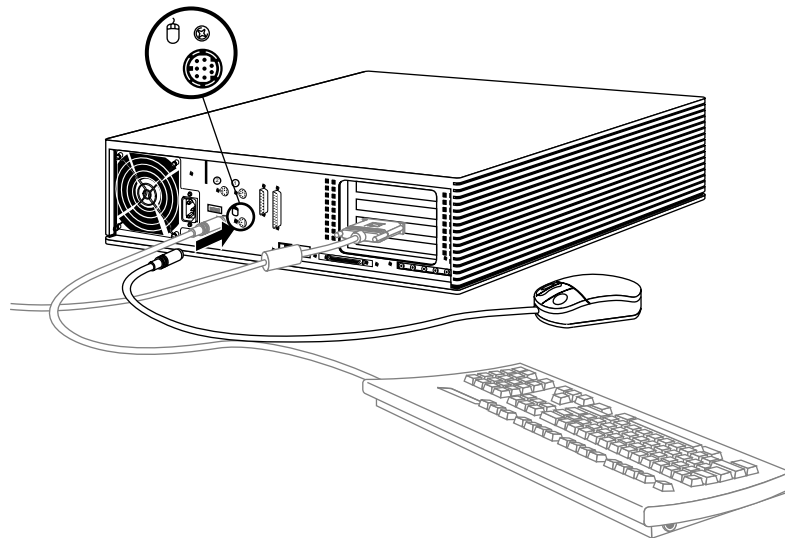
Figure 2-12   Connecting the Mouse Cable

Note: The Indigo^2 IMPACT workstation uses mice and keyboards that are PS/2 compatible. They are not interchangeable with older Silicon Graphics mice and keyboards. For a listing of some off-the-shelf PC keyboards that work with Indigo^2 IMPACT, type `man pckeyboard` from a shell window.

The default keyboard language is U.S. English. Since the Indigo^2 IMPACT system uses a PS/2 compatible keyboard that does not automatically identify the varied international keyboard languages that Silicon Graphics offers, you must set the nationality manually if you want to change the keyboard language. To find out how to do this, see Appendix B, "International Keyboard Support."

4. Connect the microphone to the connector above the microphone icon on the back of the Indigo^2 IMPACT workstation, as shown in Figure 2-13.
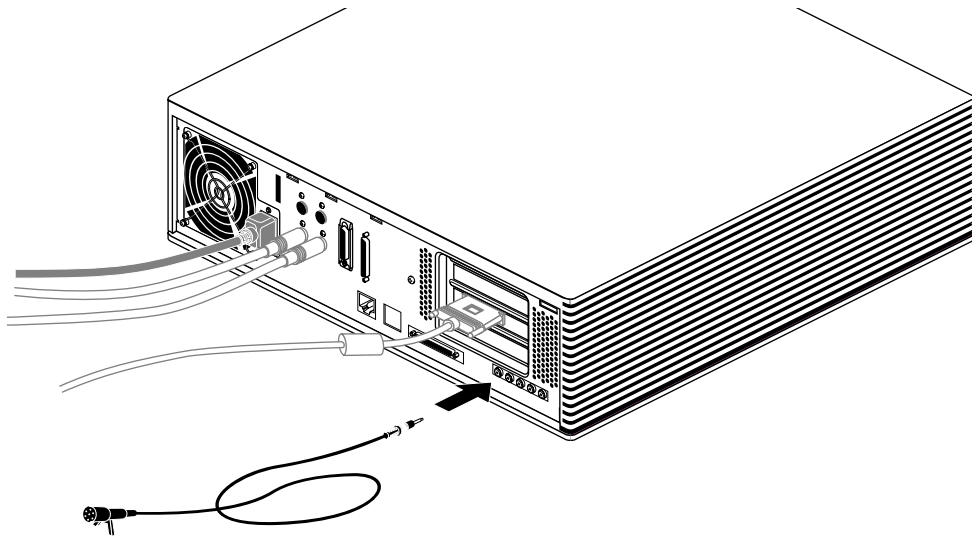
Figure 2-13   Connecting the Microphone

See Figure 2-14 for audio port detail.

Microphone input   Line output   Digital input/output

Line input   Headphone output
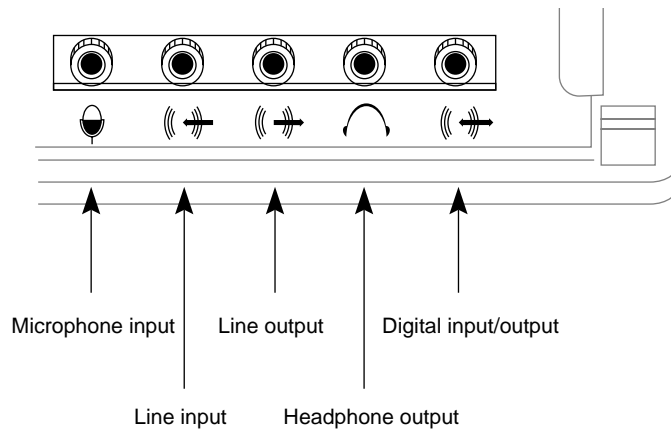
Figure 2-14   Audio Ports

Attaching the SCSI Terminator

Your Indigo^2 IMPACT workstation may have the SCSI terminator attached to the SCSI port. If it does not, you must install it. See Figure 2-15.
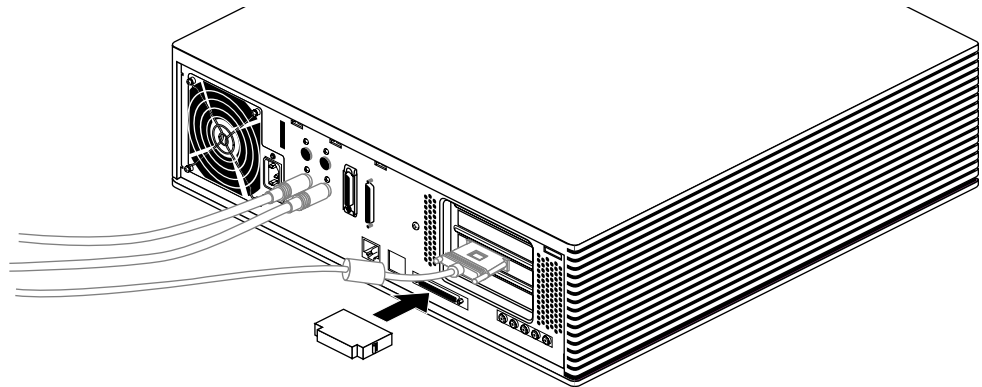
Figure 2-15   Installing SCSI Terminator

Install the terminator by pushing it into the SCSI port until it is completely seated.

Attaching the Ethernet Cable

The Indigo^2 IMPACT workstation supports two types of Ethernet connections on the main system (only one of which may be connected):

• Ethernet AUI (electrically Ethernet type 2)

• Ethernet 10-BASE T

For information on which type of Ethernet to use, see your network administrator.

To attach an Ethernet AUI cable, see below. To attach an Ethernet 10-BASE T cable, turn to "Attaching an Ethernet 10-BASE T Cable" on page 27.

Note: If you attach both an Ethernet AUI cable and an Ethernet 10-BASE T cable to your system, and the Ethernet 10-BASE T connection is "live," the system will use Ethernet 10-BASE T.

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Attaching an Ethernet AUI Cable

To attach an Ethernet AUI cable to your workstation, follow these steps:

1. From your network administrator, obtain a drop cable that is long enough to reach the back of your Indigo^2 IMPACT, but no longer than 75 feet, for correct operation.

2. Attach the Ethernet cable to the Ethernet port on the back of the Indigo^2 IMPACT workstation, as shown in Figure 2-16.
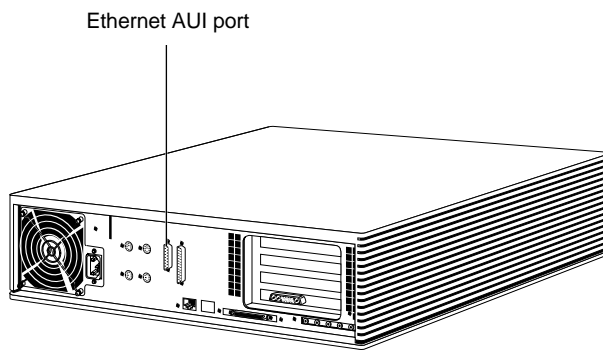
Figure 2-16   Ethernet AUI Port

- Make sure the sliding bracket on the Ethernet port on the workstation is pushed all the way down, as shown in Figure 2-17.
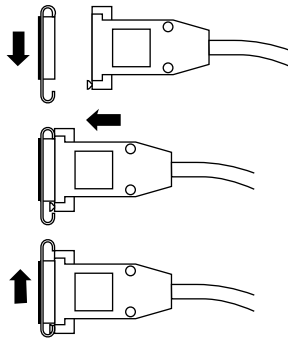
Figure 2-17   Connecting the Standard Ethernet Cable

- Plug the cable into the port.

- Slide the bracket up to hold it in place.

You are finished installing the Ethernet AUI cable. Turn to "Attaching the Power Cables" on page 28 to attach the power cables.

Attaching an Ethernet 10-BASE T Cable

If you are attaching an Ethernet 10-BASE T cable to your workstation, follow these steps:

1. From your network administrator, obtain a 10-BASE T cable that reaches from the wall to the back of your Indigo[2] IMPACT.

2. Plug one end of the cable into the Ethernet 10-BASE T port on the back of the Indigo[2] IMPACT workstation, as shown in Figure 2-18.
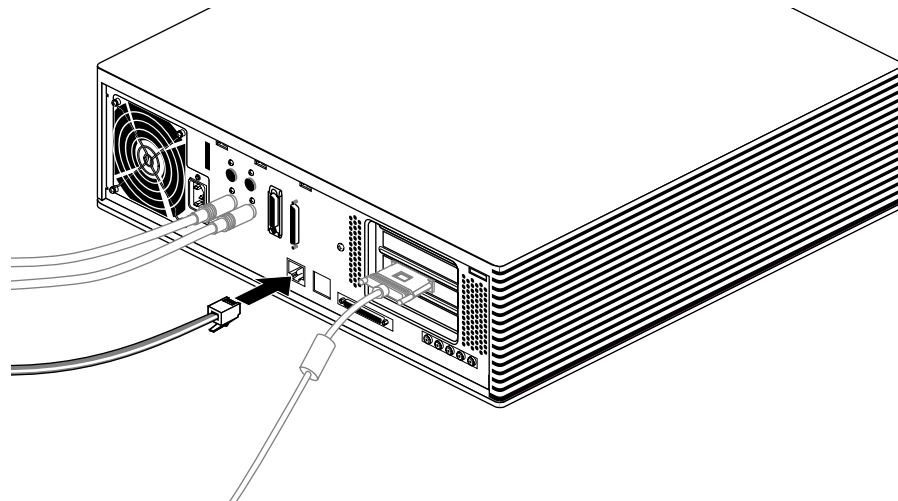
Figure 2-18   Attaching an Ethernet 10-BASE T Cable

There are earlier versions of cabling similar to 10-BASE T. These may mechanically fit the Indigo[2] IMPACT connector, but do not work electrically.

Attaching the Power Cables

You received two identical power cables—one for the monitor and one for the Indigo^2 IMPACT workstation. Silicon Graphics monitors and Indigo^2 IMPACT base systems accept 100-120/200-240 V and 50 or 60 Hz.

To attach the power cables, follow these steps:

1. Connect one power cable to the monitor, as shown in Figure 2-19.

    ■   Connect the socket end of the power cable to the power connector on the back of the monitor.

    ■   Plug the other end into a three-pronged grounded electrical outlet.

    Note: For voltage and frequency requirements, see the manual that came with your monitor.
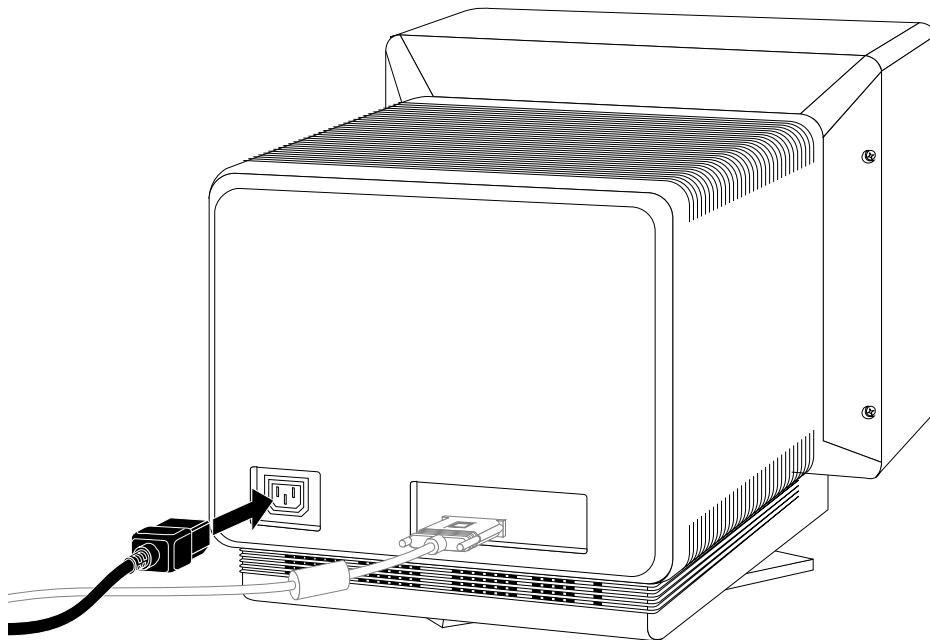
Figure 2-19   Attaching the Power Cable to the Monitor

2. Connect the other power cable to the workstation, as shown in Figure 2-20.

    ■   Connect the socket end of the power cable to the power connector on the back of the Indigo[2] IMPACT workstation.

    ■   Plug the other end into a three-pronged grounded electrical outlet.
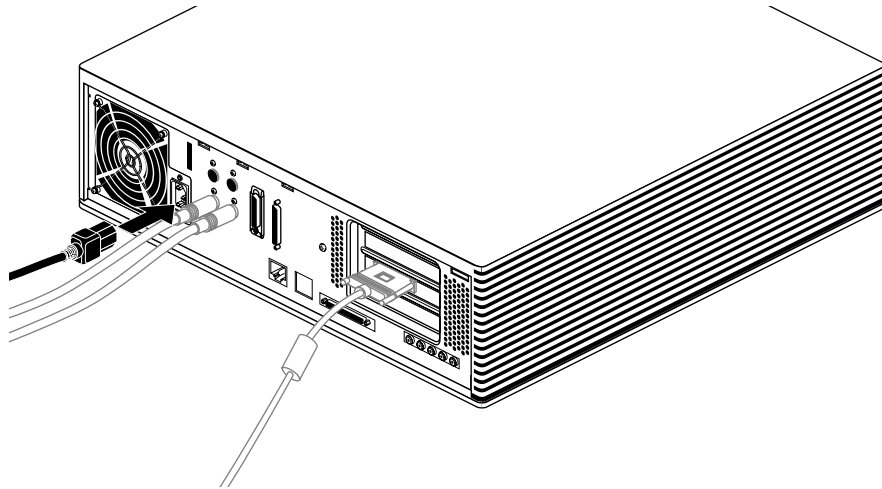
Figure 2-20   Attaching the Power Cable to the Indigo[2] IMPACT Workstation

You are finished setting up your Indigo[2] IMPACT workstation and are ready to power on.

Turning On the Indigo^2 IMPACT Workstation

Once you've connected all of the pieces as described in the last section, power on and log in to your workstation by following these steps:

1. Turn on the monitor.

    The monitor's power switch is on the front of the monitor in the lower right corner. The LED next to the switch lights up when you turn on the 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 2-21.
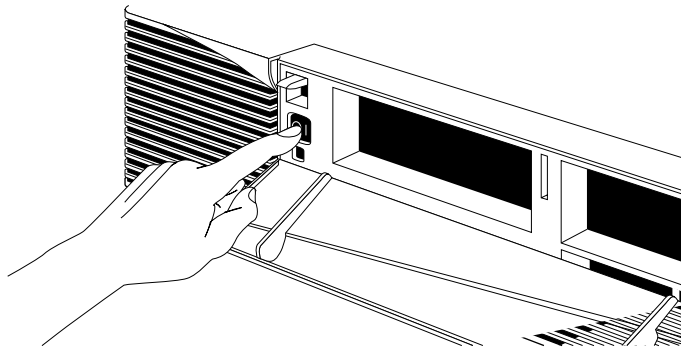
Figure 2-21   Turning On the Indigo^2 IMPACT Workstation

When you power on your system, you hear the boot "tune" and see the LED on the front of the machine turn on. While the system is running power-on diagnostics, you see an orange light. Then you see the notifier shown in Figure 2-22. If you don't see the notifier, go to Chapter 7, "Installing and Removing Software."

Figure 2-22   Running the Power-On Diagnostics Notifier

If the system passes all of the diagnostics tests, the light turns green, the system continues booting, and you see the startup notifier shown in Figure 2-23.
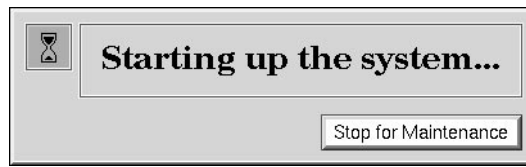
Figure 2-23   System Startup Notifier

After a few seconds, you see the notifier shown in Figure 2-34.

Figure 2-24   System Is Coming Up Notifier

If you do not hear the boot tune or the LED does not turn green, there may be a problem. Go to Chapter 7, "Installing and Removing Software," to run some tests.

The system now boots the operating system and then you see the login screen.

Logging In to the Workstation

Welcome to your new system. Once you create a user login account for yourself and set up networking software, your system has the basic information it needs to create a personal work area for you and to let you communicate with other systems and people on your network.

If this is the first time the system is being booted, you see a login screen similar to the one shown in Figure 2-25.

Figure 2-25   The Login Screen

If you already have a login account, you'll see an icon with your login name. Double-click the icon. If you do not have a login account, double-click the *EZsetup* icon and go to the next section, "Creating Your Login Account and Network Connection."

Creating Your Login Account and Network Connection

After double-clicking the *EZsetup* icon, you see the EZsetup screen shown in Figure 2-26.
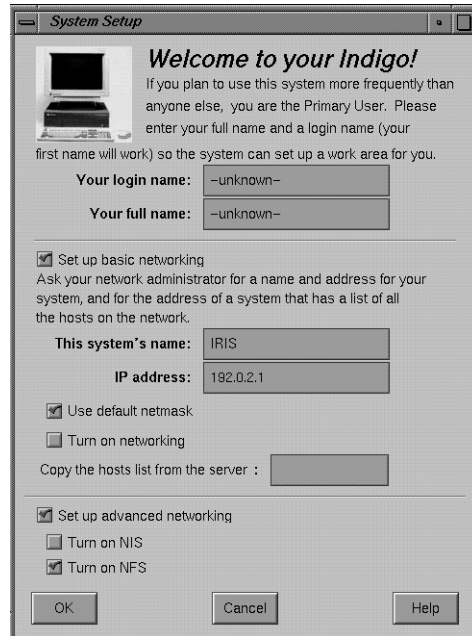
Figure 2-26   The EZsetup Screen

Setting up your login account through EZsetup gives you administrative (root) privileges.

- If you plan to connect to an existing network, contact your network administrator for a login name for yourself, a hostname and IP address for your system, and the IP address of another system on the network that has a master list of all systems on the network. Then go to Step 1 below.

- If you don't have the network information, you can complete the *login name* and *full name* fields, and click the *OK* button to set up your login account. Your network administrator can set up your network connection later. Or you can set it up yourself by choosing "System Manager" from the System toolchest and double-clicking the *Network Setup* icon.

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For more information on setting yourself up on a network, log in and select "Online Books" from the Help toolchest. Then select the *Personal System Administration Guide* and look in Chapter 3, "Setting Up Network, Peripheral, and Printer Connections."

Follow the steps below to set up your login account and network connection.

Note: If you change your mind at any time while entering the information, click the *Cancel* button. The system makes no changes, logs you out of the EZsetup account, and shows the login screen again.

1. Type your login name (usually a shorter version of your name; for example, your first name or initials) in the field labeled *Your login name*.

2. Type your full name in the field labeled *Your full name*.

    If your system is already physically connected to a network, and you have the necessary network information from your network administrator, go on to step 4.

    If your system is not connected to a network, skip to step 5.

3. Move the cursor over the box next to *Set up basic networking*, and click the mouse button. Enter the network information that your network administrator provided.

    ■   Type the hostname in the field labeled *This system's name*.

    ■   Type the IP address in the IP address field. Make sure it consists of two to four numbers, separated by periods, such as 192.0.2.2

    ■   The box next to *Use default netmask* is checked by default.
        Do not remove the check mark unless your network administrator wants to specify a custom netmask.

    ■   Click the box next to *Turn on networking*. The system will not turn on the networking software until you click *OK*.

    ■   In the field labeled *"Copy the host list from the server,"* type the IP address of a system on the network that contains a master list of all other systems on the network, if there is one. If not, use a system that has your system listed.

4. When all the information is correct, click the OK button.

    The system sets up the software, logs you out of the EZsetup account, and shows the login screen displaying people who have accounts on the system.

5. When you see the login screen, log in to your new account by double-clicking the icon that's labeled with your login name.

Now that you have a login account, go to the next section to learn about the desktop management system called the Indigo Magic™ User Environment.

Using the Indigo Magic User Environment

Once you're logged in, you are in the Indigo Magic User Environment. Before learning about the environment, however, you may be interested in learning a few tips and shortcuts for using the mouse.

Mouse Techniques and Shortcuts

To get started, you need to know a few basic techniques for using the mouse and working with icons.

• To *select an icon*, place the cursor over the icon and then press the left mouse button. Icons turn yellow when they are selected.

• To *select several icons*, press the `<Shift>` key while selecting the icons, or press the left mouse button in the background and drag the mouse. A box is created as you drag the mouse. All icons touched by the box you create are selected.

• To *open an icon*, place the cursor over the icon and then double-click the left mouse button. When you open an application icon, you run the application; when you open a folder icon, you open a window that shows the contents of that directory.

• To *drag and drop* icons, place the cursor on an icon, press the left mouse button, and move the mouse. Release the mouse button to drop the icon.

    This drag-and-drop technique lets you copy icons from one directory to another and launch applications with a particular file.

• To *display a popup menu that contains commands from the Selected menu*, place the cursor over a window and then press the right mouse button. (Not all windows have popup menus.)

Now you are ready to use the desktop management system called the Indigo Magic User Environment.

Reading the following sections will give you a quick overview of the new environment and help you become productive rapidly.

The Desktop and the Icons

When you log in, a collection of windows and icons (small pictures) appears on your screen by default. If you don't see any items on your screen, contact your system administrator.

The screen background is called the *desktop*. It's a place for you to set frequently used icons so you have quick and easy access to them. In this way, the *desktop* is similar to an actual office desk. For example, on your desk you might have a telephone, a container of pens and pencils, and a stack of folders or notebooks related to the projects on which you're currently working. Other, less frequently used items are stashed away in desk drawers. Your online *desktop* mimics this arrangement using icons.

Figure 2-27
Desktop Icons

The default *desktop* contains

- the console window

- the toolchest

- the *desktop* and the icons that appear on it

By default, several icons appear on the *desktop*: a folder icon representing your home directory, a dumpster icon, and icons for peripherals you have installed. (See Figure 2-27.)

Figure 2-28
CD Player Icon

The peripheral icons show the current state of the devices they represent. For example, if you place a music CD into the compact disc player, the icon changes to display a few musical notes. (See Figure 2-28.) When you double-click the icon, it opens CD Manager, a utility that lets you play and record from a compact disc.

The Console Window

Figure 2-29
The Minimized
Console Window

The small box next to the toolchest is the console window. It looks like a small box because it has been minimized. You can open it to its full size by clicking on it with the left mouse button. Many of the error messages that the system generates appear in this window.

Clicking on the console brings up the IRIX shell where you can type IRIX commands. For information on IRIX commands, open the Help toolchest and choose "Online Books." Select *IRIS Essentials* and look for "Using IRIX Commands."

The Toolchest

Figure 2-30
The Toolchest

The toolchest in the top left-hand corner of the screen (shown in Figure 2-30) provides a listing of most of the system functions and programs. Under the System toolchest is the System Manager, which provides hardware information about your workstation. From the Help toolchest you can access the library of online documentation and online help.

To pop up a menu, move the cursor over a label on a toolchest, then press the left or right mouse button.

IRIS InSight and Online Help

Figure 2-31
IRIS InSight Icon

The Indigo^2 IMPACT workstation includes IRIS InSight (shown in Figure 2-31), a library of online documentation and extensive online help that is available from the desktop and from most Silicon Graphics applications. From the desktop, you access the online help and documentation from the Help toolchest as follows:

• From the Help toolchest, choose "Online Books" and the IRIS InSight Document Library appears. Once the IRIS InSight Document Library is open, you can open a manual and read it, or you can type in a word or phrase and quickly find the information you need. See the IRIS InSight online help for instructions.

• From the Help toolchest, choose "Desktop Help." A listing of system-level help appears. Additionally, each application provides a Help button or Help menu so that you can get help on a particular application.

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Shutting Down and Powering Off Your Indigo^2 IMPACT System

There are two ways to shut down and power off your Indigo^2 IMPACT system:

- Use the power switch to shut down the system software and power off.

- Use the Toolchest menu to shut down the system software and return to the System Maintenance menu or power off.

Using the Power Switch to Shut Down the System

To use the power switch to shut down the software and power off the system, follow these steps:

1. Open the front cover of the chassis, as shown in Figure 2-32.

   ■ Face the front of the Indigo^2 IMPACT chassis.

   ■ Snap the cover away from the top edge of the chassis and tip it down, as shown in Figure 2-32.
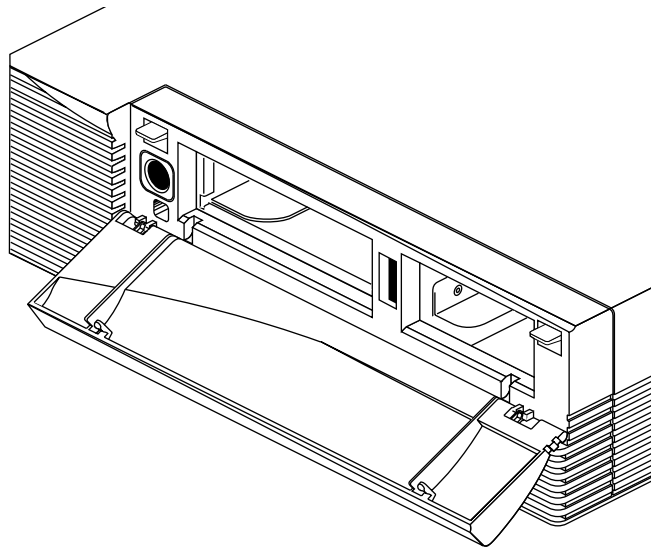
Figure 2-32   Opening the Front Cover

2. Press and release the power switch, as shown in Figure 2-33.
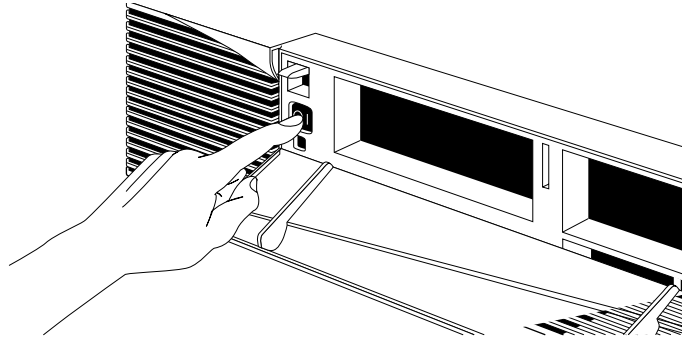
Figure 2-33   Pressing and Releasing the Power Switch

3. The notifier shown in Figure 2-34 appears on your screen within a few seconds. Then the system powers off automatically within the next minute.
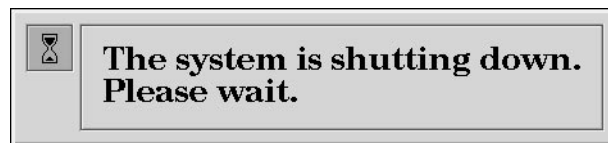
Figure 2-34   System Shutdown Notifier

4. Turn off the monitor by pressing the monitor power switch.

If the system does not power off, either the system never came up all the way, or the operating system is hung. If you do not see any activity for several minutes, follow the steps below.

1. Press and hold the power button again.

   Note: If you press the power switch a second time, the system powers off immediately, but it is not a clean shutdown. Avoid using this method unless the system does not respond for several minutes after you press the power button the first time.

2. If that doesn't work, use a pencil to press the reset switch, wait a few seconds, and then press the power button. See Figure 2-35.
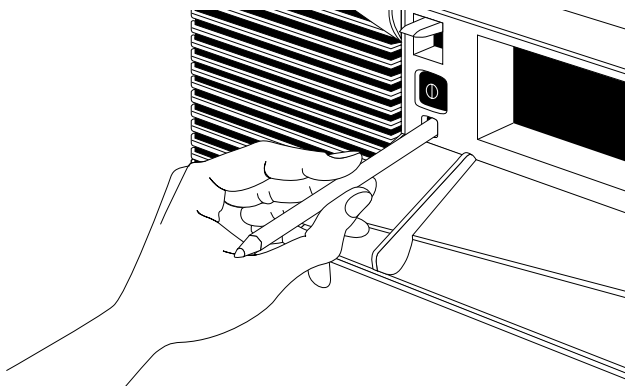
Figure 2-35   Power Switch and Reset Switch

3. If the system still fails to power off, unplug the power cord from the back of the workstation and contact your maintenance provider.

Using the Toolchest to Shut Down the System

Figure 2-36
The Toolchest

You can use the System menu in the Toolchest to shut down the system. You can also choose to power off the system. To do this, follow these steps:

1. Choose "System Shutdown" from the System menu in the Toolchest.

    ■   Place the cursor over the word "System" in the Toolchest and click the left or right mouse button. The toolchest is shown in Figure 2-36.

    ■   Place the cursor over the words "System Shutdown" and click the mouse button.

After a few seconds you see the notifier shown in Figure 2-37. At this point you can either power off the system, or shut down the system and get the System Maintenance Menu.
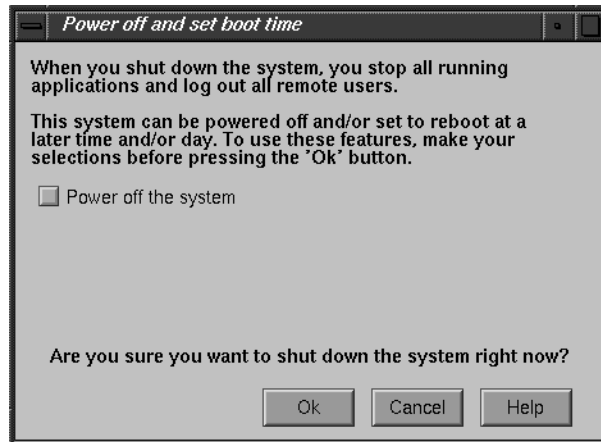
Figure 2-37   System Shutdown Caution Message

- To power off the system, click *Power Off the System* and then click *OK*. The screen clears and you see the notifier shown in Figure 2-38. After a few seconds, the system powers off.

- To shut down the system and get the System Maintenance Menu, click *OK* at the notifier shown in Figure 2-37. The screen clears and you see the notifier shown in Figure 2-38.
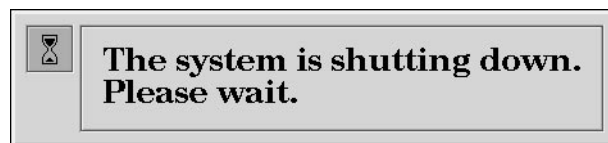
Figure 2-38   System Shutdown Notifier

Next you see the message shown in Figure 2-39.
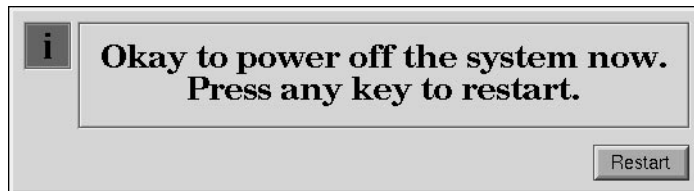
Figure 2-39   Okay to Power Off Notifier

■   Click *Restart*. You see the system startup message shown in Figure 2-40.

Figure 2-40   Starting Up the System Notifier

■   Click *Stop for Maintenance* or press **<Esc>** to bring up the System Maintenance menu.

Locking Your Indigo^2 IMPACT Workstation

To lock your Indigo^2 IMPACT workstation, follow these steps:

1. Snap the front cover away from the top edge of the chassis and tip it down.

2. Place the straight end of the lockbar into the opening between the disk drive slots in the front of the chassis, and push the lockbar all the way through the workstation, as shown in Figure 2-41.
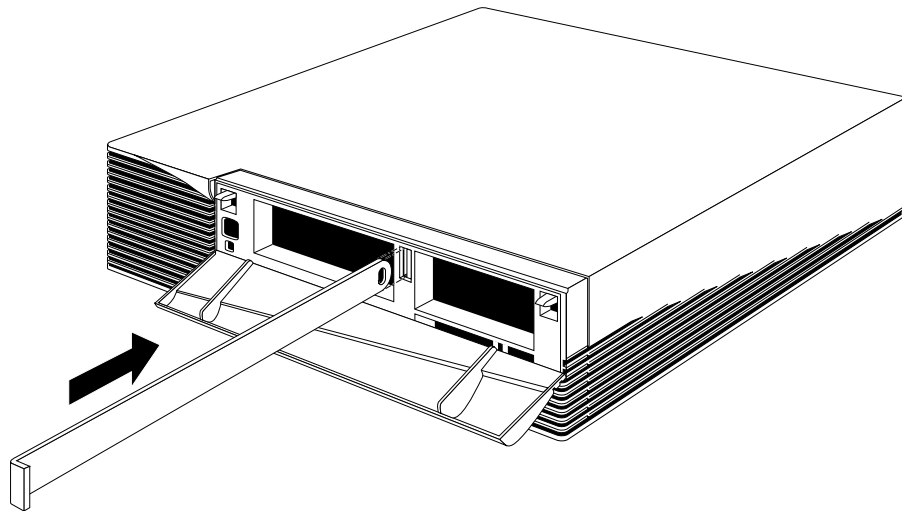
Figure 2-41   Installing the Lockbar

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3. Attach a lock through the hole in the lockbar in the back of the workstation to lock it, as shown in Figure 2-42.
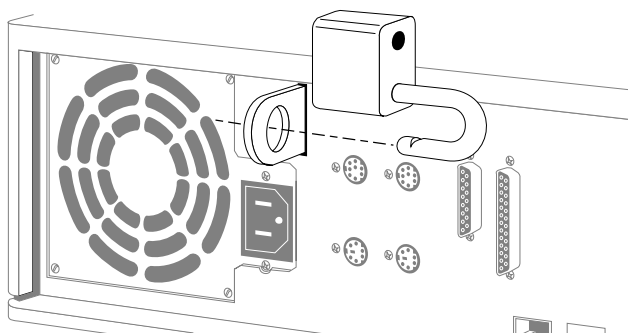
Figure 2-42   Locking the Indigo² IMPACT Workstation

4. Close the front cover.

Congratulations! You have finished setting up your Indigo² IMPACT workstation.

Installing and Removing Memory

This chapter describes how to install and remove SIMMs (single inline memory modules) in your Indigo^2 IMPACT workstation.

Installing and Removing Memory

This chapter tells you how to install and remove single inline memory modules (SIMMs). You may need to remove and replace SIMMs if you are upgrading the memory in your system. Also, if diagnostic tests report failures, or if you get memory parity errors (see Chapter 7, "Installing and Removing Software"), you may need to remove and replace SIMMs.

Installing Memory

Many customers order additional memory for their systems. You may have received extra SIMMs with your Indigo^2 IMPACT shipment or later in a separate package.

Carefully follow all steps in the following sections to shut down your system, remove the cover, install the SIMMs, replace the cover, and test to make sure the SIMMs are installed and working properly.

Installing the Texture Memory Option Board

Refer to Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards," for instructions on removing and replacing the texture memory option board.

Shutting Down and Powering Off the System

To shut down and power off the system, follow these steps:

1. Open the front cover.
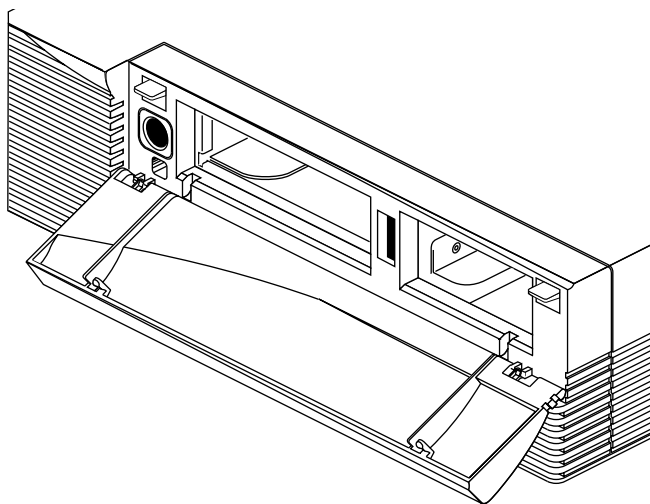
Figure 3-1   Opening the Cover

2. Press and release the power switch on the front of the system to shut down the software and power off the system.

   The system powers off automatically.
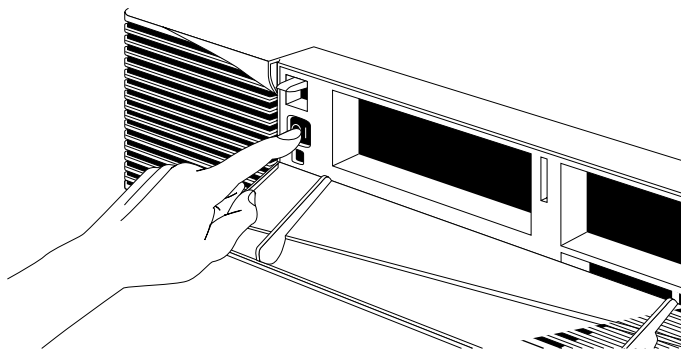
Figure 3-2   Powering Off the System

3. Press the monitor power switch to turn off your monitor.

4. Disconnect the power cable from the back of the Indigo[2] IMPACT workstation.

Removing the Cover

Once the system is shut down and the power cable is disconnected, follow these steps:

1. Remove the bezel.

   ■ Press down on the tabs on each side of the bezel, as shown in Figure 3-3.

Press down
to release bezel

Bezel

Lockbar slot
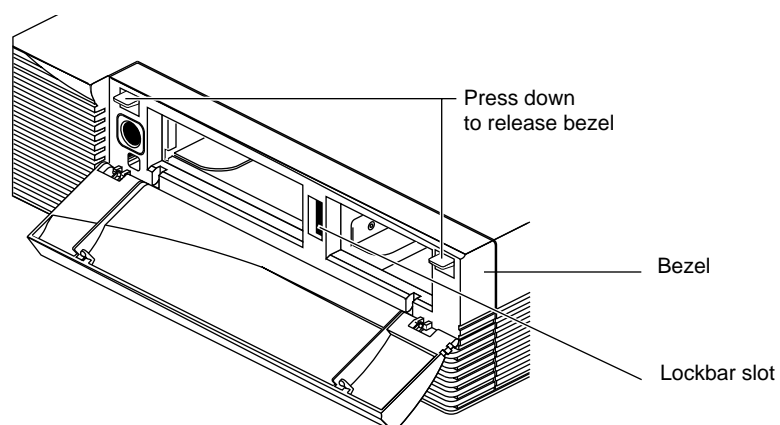
Figure 3-3   Releasing the Bezel

2. Remove the lockbar if you have one installed.

   ■ Remove the lock from the exterior rear of the workstation.

   ■ Slide the lockbar out of the bezel.

■ Pull the bezel down and away from the chassis.
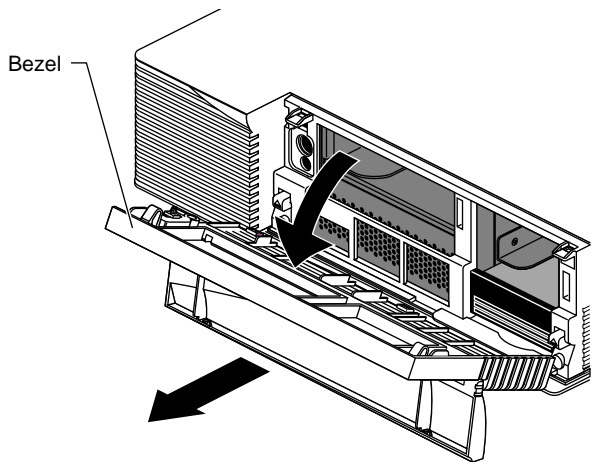
Figure 3-4   Removing the Bezel

■ Press up on the tabs on each side of the drive openings, as shown in Figure 3-5.
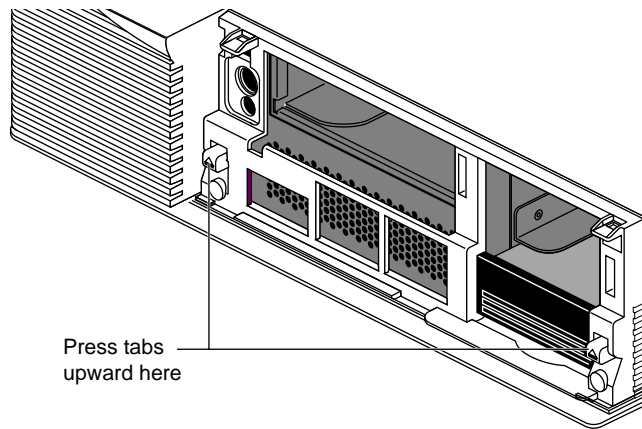
Figure 3-5   Releasing the Top Cover

■ Pull up on the cover and lift it back and away from the chassis, as shown in Figure 3-6.
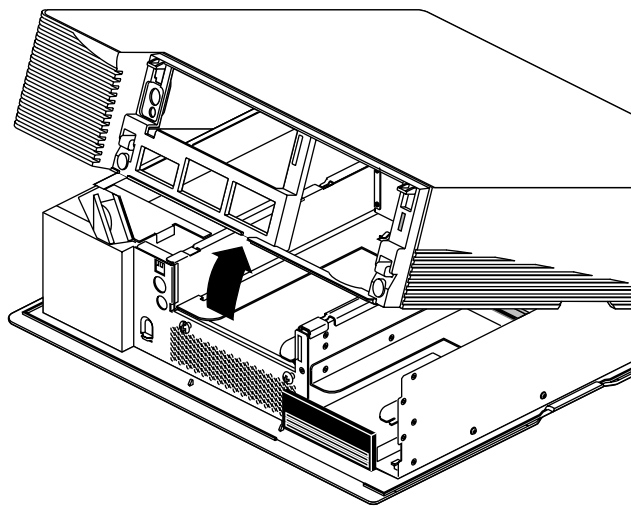
Figure 3-6   Removing the Top Cover

Tip: If the cover is difficult to raise, check the locking levers of your drives to be sure they are fully locked. The levers should be pushed all the way to the right.

Installing the SIMMs

To install SIMMs, follow these steps:

Attach the wrist strap.

1. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.

2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

3. Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo[2] IMPACT workstation.

    Caution: The workstation's internal components are sensitive to static electricity. Handle the parts carefully, and wear the wrist strap to avoid the flow of static electricity.

4. Turn the workstation so that you face the rear of the chassis. The SIMM sockets are in the center of the workstation, toward the back of the chassis, as shown in Figure 3-7.
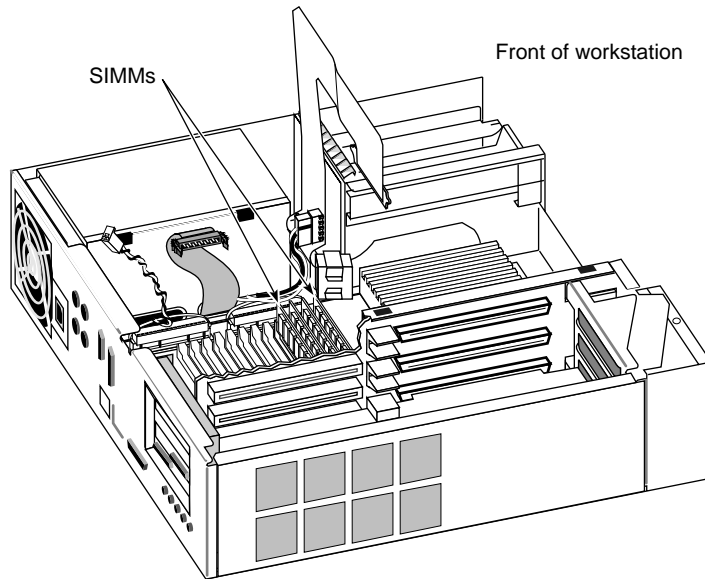
Figure 3-7 Locating the SIMM Sockets

5. Disconnect the SCSI cable, power cable, and twisted-pair cable to allow yourself better access to the SIMM slots. See Figure 3-8.
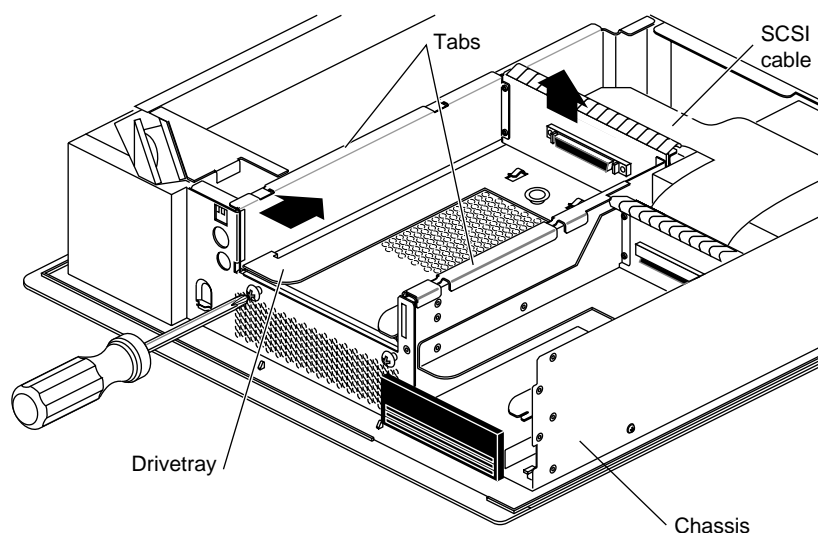
Figure 3-8   Disconnecting the SCSI Cable

6. Disconnect the SCSI cable from the back of the 5-1/4" drive tray. The drive tray is located above and to the rear of the SIMM sockets.

   ■   Unclip the wire clips on the SCSI cable from the edges of the connector and disconnect the SCSI cable from the connector on the back of the drive tray.

7. Disconnect the midplane power cables (ribbon and twisted pair) from the gold-colored midplane. These cables cross the SIMM sockets and connect the power supply to the midplane.

   Note: If you have an IMPACT Ready Indigo^2 workstation, you will not disconnect and connect these cables, because they terminate to the power supply.

   ■   Pinch together the corrugated edges on the ribbon cable connector, and pull gently to disconnect it from the midplane. See Figure 3-9.

   ■   Pull gently on the twisted-pair connector to disconnect it from the midplane. See Figure 3-9.
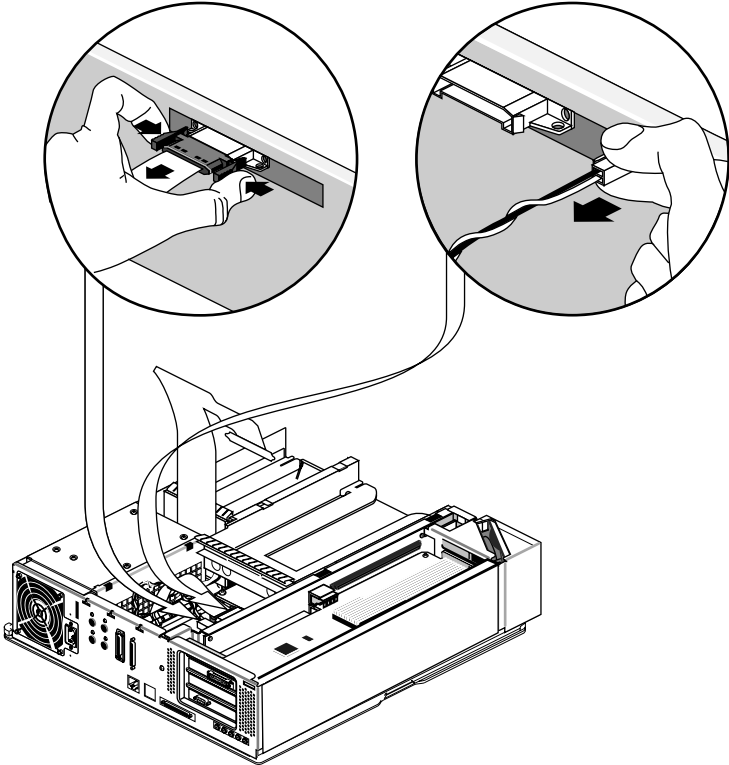
Figure 3-9   Disconnecting the Midplane Power Cables

Twelve sockets are split into three banks—A, B, and C. The four sockets closest to the center of the workstation make up Bank C. The next four sockets make up Bank B. The four sockets closest to the rear of the chassis make up Bank A. The banks are labeled on the baseboard. See Figure 3-10.
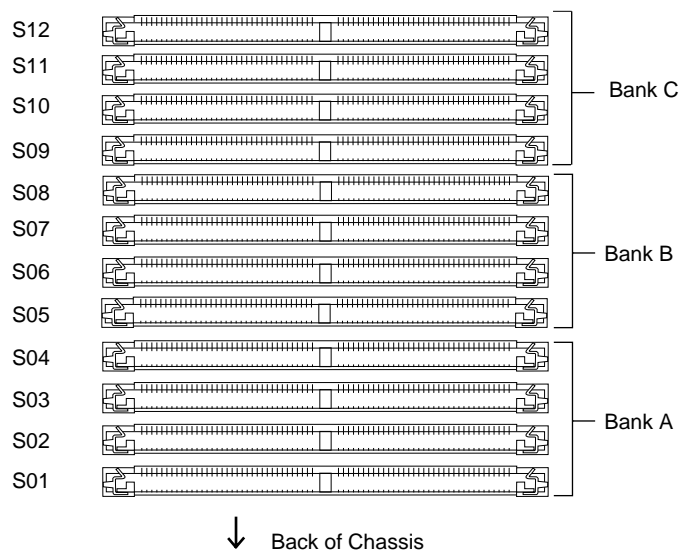
Figure 3-10   Identifying the SIMM Slots and Banks

The SIMM sockets are labeled from 1 through 12, beginning with the first slot in Bank A. The sockets are labeled on the baseboard.

Note: If you are installing SIMMs in bank C, you must remove the 5-1/4" drive tray first, before installing the SIMMs. Turn to "Removing the 5-1/4" Drive Tray" on page 67 for instructions.

8.   Install the first SIMM.

■   Install SIMMs consecutively, in groups of four, beginning with the open slot farthest away from you (from Bank C to Bank A). For example, if Bank C is full, beginning installing SIMMs in S08, the slot in Bank B that is closest to Bank C. (See Figure 3-10.)

Note: All the SIMMs in a bank must be the same size.

■ Facing the rear of the workstation and using both hands, grasp the top of the SIMM so the notch in the bottom corner of the SIMM is on your left, as shown in Figure 3-11.
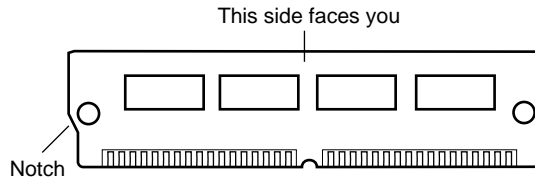
Figure 3-11   Orienting the SIMM When Facing the Rear of the Workstation

■ Tip the top of the SIMM toward you, as shown in Figure 3-12, and press the SIMM securely into the socket at a 45-degree angle to the board.
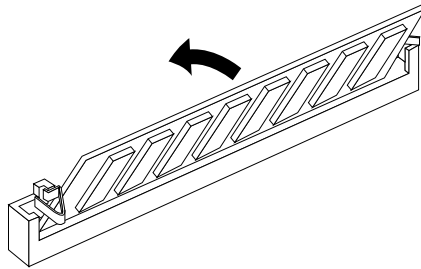
Figure 3-12   Tilting the SIMM Up to a Vertical Position

■ Tilt the SIMM up into a vertical position.

■ The SIMM is positioned correctly when the latches on both sides of the SIMM socket are hugging the edges of the SIMM.

9. Install the other SIMMs.

10. Visually check the tops of the SIMMs to make sure they are installed correctly.

If a SIMM is not sitting vertically, push it upward until it is completely vertical.

11. Reconnect the power cable and twisted pair cable to the gold-colored midplane. See Figure 3-13.

Note: If you have an IMPACT Ready Indigo^2 workstation, you will not disconnect and reconnect these cables, because they terminate to the power supply.

- Pinch together the corrugated edges on the ribbon cable connector, and push gently to connect it to the midplane.

- Push the twisted-pair connector gently into its connector on the midplane.
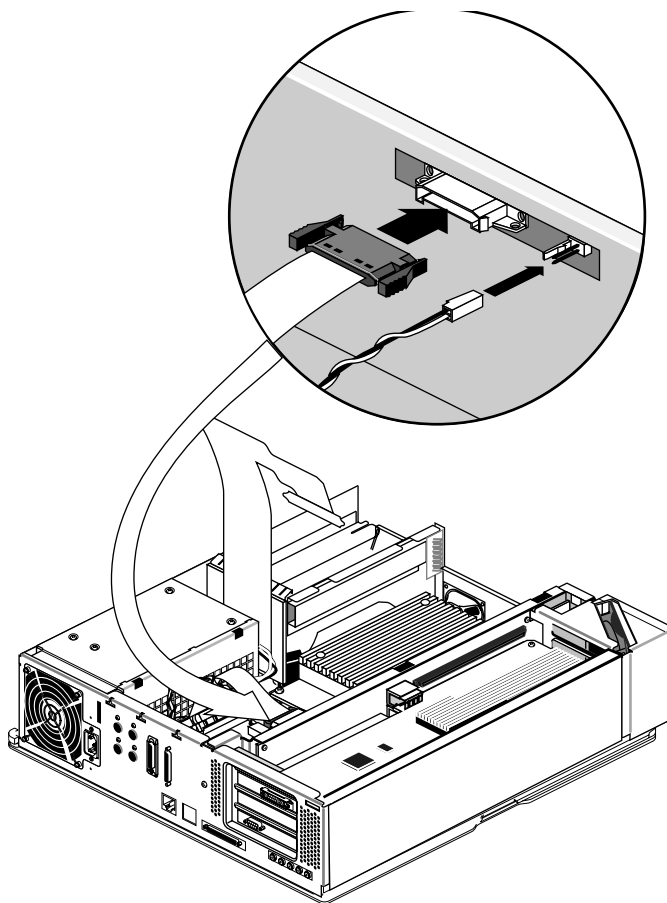
Figure 3-13   Connecting the Midplane Power Cables

12. If you removed the drive tray, turn the workstation so you are facing the front and replace the drive tray. See "Replacing the 5-1/4" Drive Tray" on page 73.

13. Reconnect the SCSI cable on the back of the 5-1/4" drive tray.

- Push the SCSI cable into the connector on the back of the drive tray.

■ Slip the wire clips on the SCSI cable over the edges of the connector to hold the SCSI cable securely in place.

You are ready to replace the cover.

Replacing the Cover

It is important to replace the cover before testing the SIMMs. This ensures proper airflow through the workstation while the system is running the test.

To replace the cover, follow these steps:

1. Locate the tabs on the inside and back of the top cover, and the holes on the back of the workstation. Figure 3-14.

    ■   Look through the holes as you lower the cover and move the tabs into place.
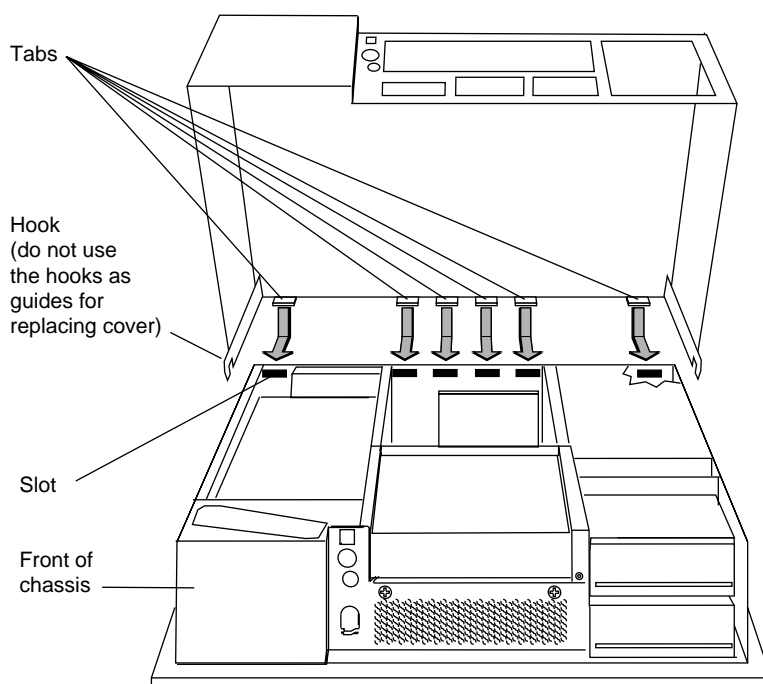
Figure 3-14   Replacing the Top Cover

    ■   Slide the tabs into the holes and pull the cover down until it snaps into place. The cover fits tightly over the chassis.

2. Replace the bezel.

    ■   Place the tabs on the bottom of the bezel in the grooves in the front of the chassis. See Figure 3-15.

    ■   Tilt the bezel up until it snaps into place.
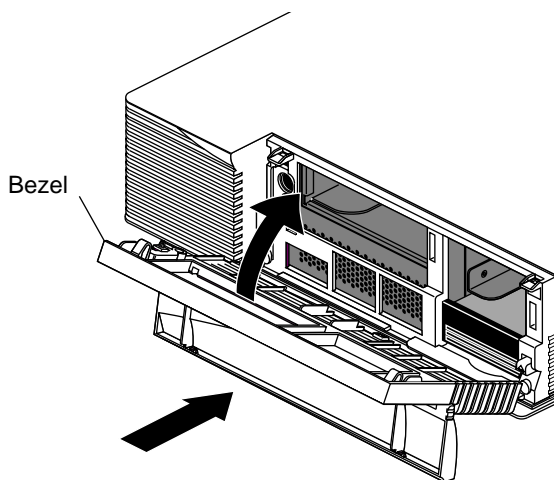
Bezel

Figure 3-15   Replacing the Bezel

3. Replace the lockbar if you removed it.

4. Close the front cover of the bezel.

5. Reconnect the power cable to the connector on the back of the workstation.

You are ready to power on the system and check the new memory.

Checking New Memory

Make sure the system recognizes the new memory. To check the amount of memory on your system, follow these steps:

1. If your Indigo^2 IMPACT workstation is new, make sure you've already installed the system disk before turning on the system.

2. Press the power switch to turn on the power.

After the power-on diagnostics run, you'll see a notifier, as shown in Figure 3-16.
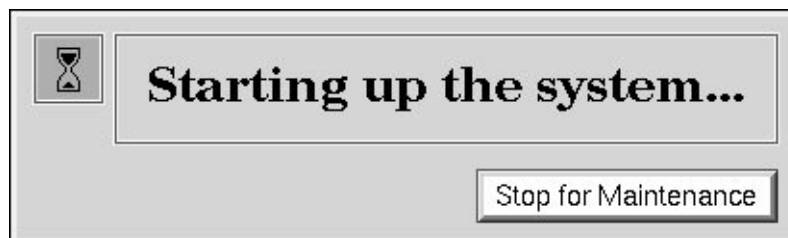
Figure 3-16   System Startup Notifier

After a few seconds, you see the notifier shown in Figure 3-17.

Figure 3-17   System Is Coming Up Notifier

The system boots and brings up the login screen.

If no picture appears on your screen and the yellow fault light blinks, one or more SIMMs are not installed correctly. Turn off the system, remove the cover, and check that the SIMMs are installed correctly. Then try this procedure again. If it still fails, see Chapter 7, "Installing and Removing Software."

3. Log in to your account. For more information on logging in, refer to "Logging In to the Workstation" on page 32.

    When you log in, the default *desk* appears. In the upper left-hand corner of the screen are the toolchests.

4. Choose "System Manager" from the System toolchest.

    You see a window showing Hardware and Shared Resources.

5. Look under the Hardware listing for the line showing memory. The amount of memory shown in megabytes should equal the amount of memory that came with the workstation plus the amount of memory you installed.

For example, if you had 32 MB of memory on the workstation when you started and you installed another 32 MB, you should have a total of 64 MB.

Note: If the amount of memory you just installed is not added to the original amount, the SIMMs are not installed correctly. Make sure that all of the SIMMs are all the way in. Return to "Installing Memory" on page 47 to check the SIMMs. Then try this procedure again.

Now you are ready to use the Indigo^2 IMPACT workstation.

Removing Memory

You may need to remove SIMMs if one fails or if you want to upgrade the memory in your system.

Caution: SIMMs and the system's internal components are sensitive to static electricity. Handle the SIMMs carefully, and wear the wrist strap to avoid the flow of static electricity.

To remove memory SIMMs, you must shut down the system, remove the cover, remove the 5-1/4" drive tray (if necessary), disconnect three cables, and remove the SIMMs. Then, reconnect the three cables, replace the 5-1/4" drive tray (if you removed it) and the cover. You need a Phillips screwdriver to remove the 5-1/4" drive tray.

Shutting Down the System

To shut down the system, follow these steps:

1. Open the front cover.

2. Press and release the power switch on the front of the workstation to shut down the software and power off the system.

   The system powers off automatically.

3. Disconnect the power cable from the back of the workstation.

Removing the Cover

Once the system is shut down and the power cable is disconnected, follow these steps:

1. Remove the bezel.

    ■   Press down on the tabs on each side of the bezel, as shown in Figure 3-18.
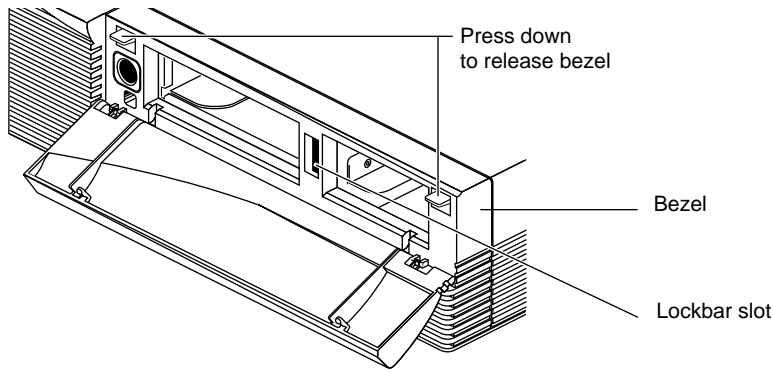
Figure 3-18   Releasing the Bezel

    ■   Pull the bezel down and away from the chassis.
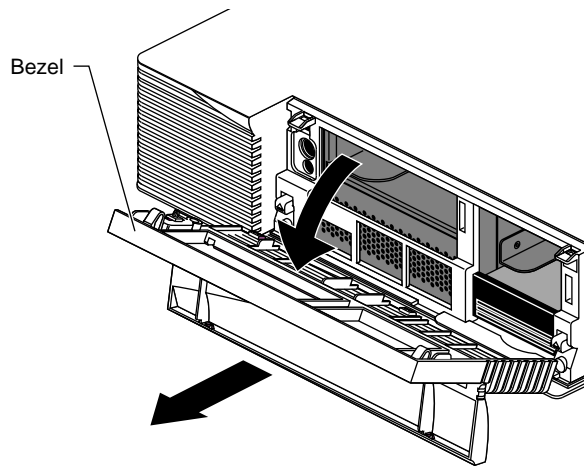
Figure 3-19   Removing the Bezel

2. Remove the top cover.

■ Press up on the tabs on each side of the drive openings as shown in Figure 3-20.

Press tabs
upward here
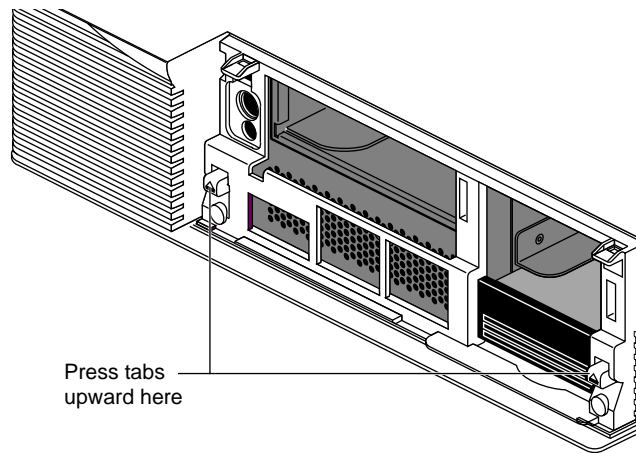
Figure 3-20 Releasing the Top Cover

■   Pull up on the cover and lift it back and away from the chassis, as shown in Figure 3-21.
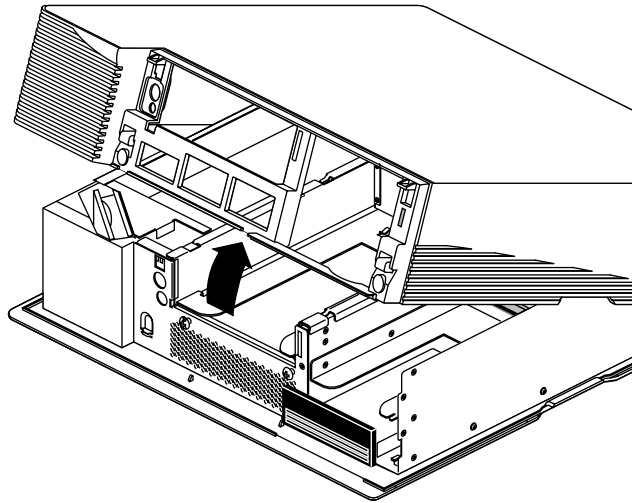
Figure 3-21   Removing the Top Cover

Tip: If the cover is difficult to raise, check the locking levers of your drives to be sure they are fully locked. The levers should be pushed all the way to the right.

Locating the SIMMs

The SIMMs are located in the center of the workstation, toward the back, as shown in Figure 3-22.
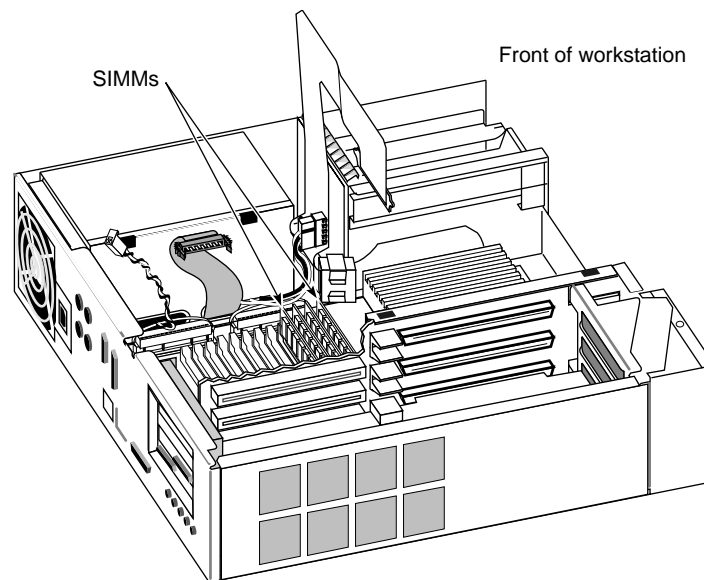
Figure 3-22   Locating the SIMMs

Removing the 5-1/4" Drive Tray

The first few SIMMS in Bank C are located beneath the 5-1/4" drive tray. If you need to remove these SIMMs, you must first remove the drive tray. You will need a Phillips screwdriver to remove the drive tray.

If the SIMMs you are removing are not covered by the 5-1/4" drive tray, *you do not need to remove the tray*. Turn to "Removing the SIMMs" on page 69 for instructions on how to remove the SIMMs.

To remove the 5-1/4" drive tray, follow these steps:

1. Ground yourself to the chassis.

2. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.

3. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

4. Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo[2] IMPACT workstation.

    Caution: The workstation's internal components are sensitive to static electricity. Handle the parts carefully, and wear the wrist strap to avoid the flow of static electricity.

5. Disconnect the SCSI cable from the connector on the back of the 5-1/4" drive tray.

    ■   Unclip the wire clips on the SCSI cable from the sides of the connector and disconnect the SCSI cable from the connector on the back of the drive tray.

6. Use a Phillips screwdriver to loosen the two captive screws holding the 5-1/4" drive tray to the chassis.

    Note: If a drive is installed, you do not need to remove it.

7. Push the drive tray assembly backward, and pull up to remove it, as shown in Figure 3-23.
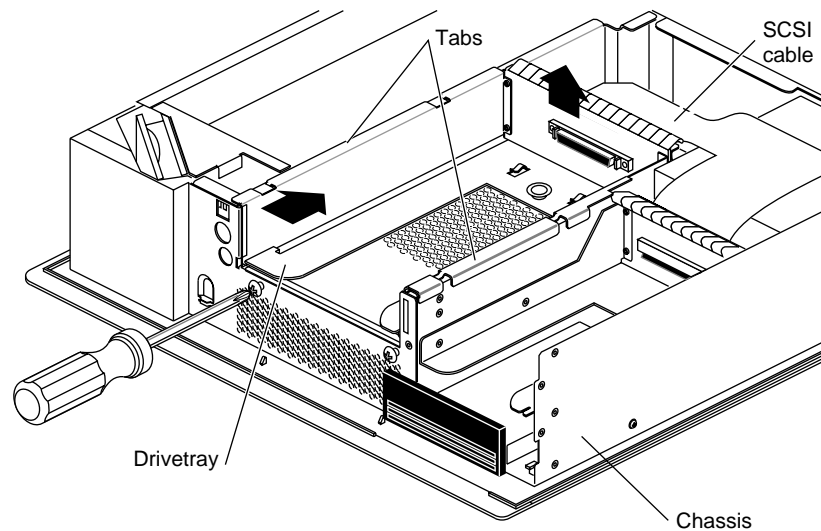
Figure 3-23   Removing the 5-1/4" Drive Tray

Removing the SIMMs

To remove the SIMMs, follow these steps:

1. Make sure your wrist strap is attached to a metal part of the chassis and the elastic is secure around your arm.

    Note: If you have an IMPACT Ready Indigo[2] workstation, you will not disconnect and connect these cables.

2. Disconnect the ribbon cable and twisted pair cable from the gold-colored midplane.

   ■ Pinch together the corrugated edges on the ribbon cable connector, and pull it free from the midplane. See Figure 3-24.

   ■ Pull the white lever on the midplane away from the twisted-pair connector. Pull gently on the twisted-pair connector to disconnect it from the midplane.
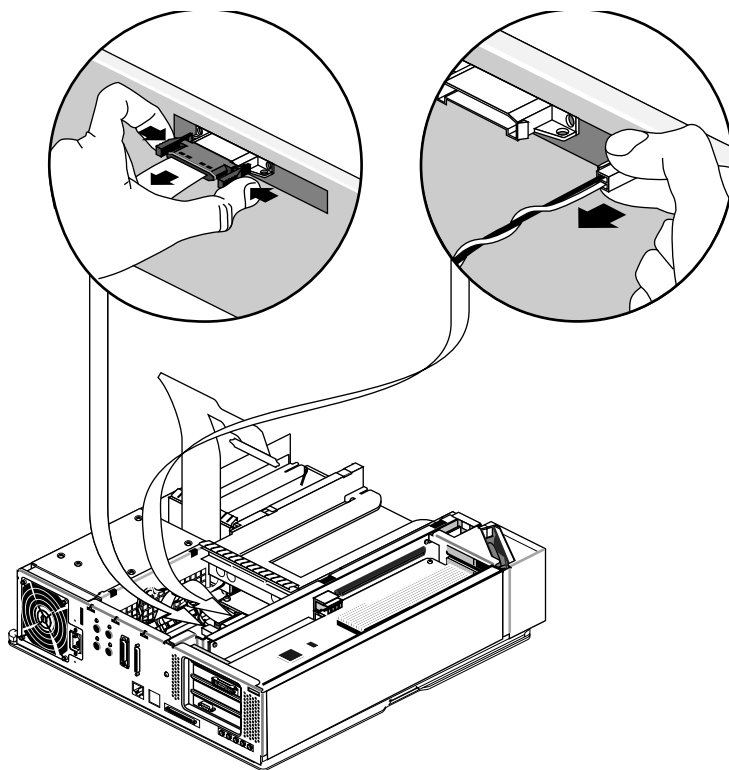
Figure 3-24   Disconnecting the Midplane Power and Twisted-Pair Cables

3. Remove the SIMMs.

■ Face the back of the workstation.

■ Locate the memory SIMMs you want to remove.

Note: In order to replace a faulty SIMM, you need to first remove the SIMM closest to the rear of the chassis, then remove the following SIMMs until you reach the SIMM you want to replace.

■ Use the SIMM removal tool that came with your SIMMs. Place the flat side of the tool against the side of the SIMM (as shown in Figure 3-25) and press down on the latches on each side of the SIMM.

The SIMM releases and tips toward you about 45 degrees.
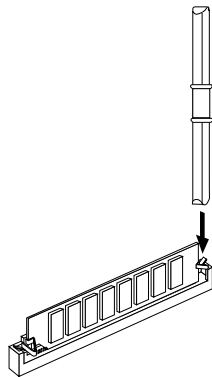
Figure 3-25   Removing a SIMM

■ Pull the SIMM out of the socket.

■ Remove the other SIMMs.

To replace the SIMMs, turn to "Installing the SIMMs" on page 51.

If you are not replacing SIMMs, go to the next step.

4. If you are not replacing SIMMs, reconnect the ribbon cable and twisted pair cable to the gold-colored midplane.

   ■ Pinch together the corrugated edges on the ribbon cable connector, and connect it to the midplane. See Figure 3-26.

   ■ Push the twisted-pair connector gently into its connector on the midplane.
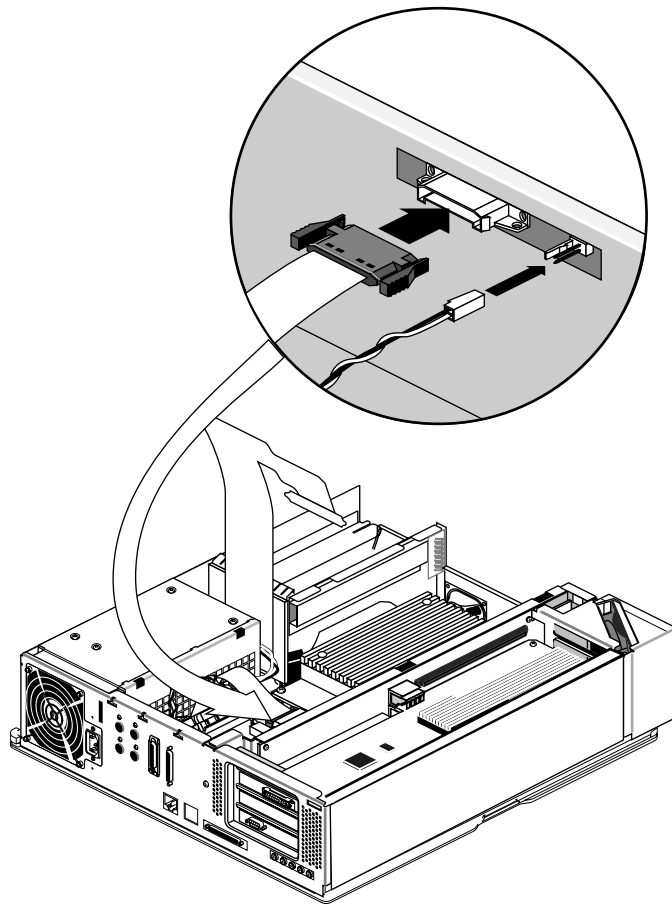
Figure 3-26   Connecting the Midplane Power Cables

Replacing the 5-1/4" Drive Tray

If you removed the drive tray, follow these steps to replace it:

1. Make sure your wrist strap is attached to a metal part of the chassis and the elastic is secure around your arm.

2. Replace the 5-1/4" drive tray assembly.

   ■   Position the drive and tray so the tabs on the sides of the tray fit inside the slot openings in the chassis, and the open side of the tray faces the front of the workstation. See Figure 3-27.

   ■   Push the tray forward about 1/2" to lock it in place.

   ■   Tighten the two captive screws.

3. Reattach the SCSI cable to the connector on the back of the drive tray.

   ■   Push the SCSI cable into the connector.

   ■   Slip the wire clips on the SCSI cable over the edges of the connector to hold the SCSI cable securely in place.
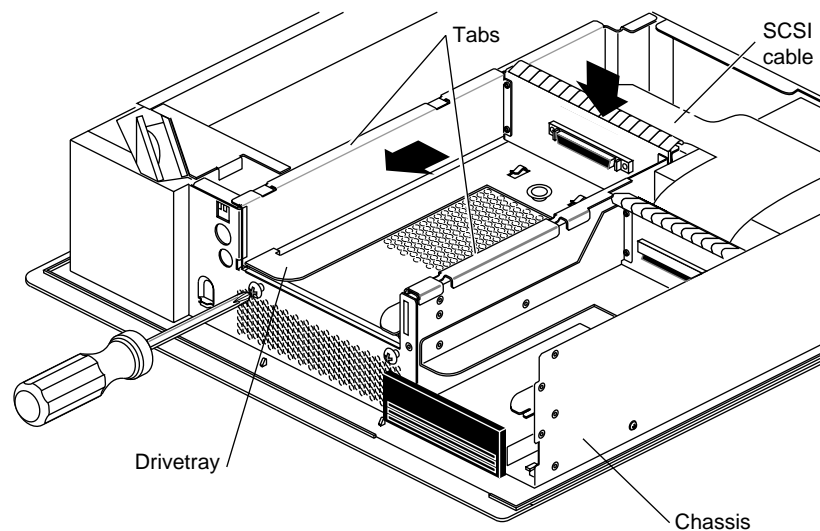
Figure 3-27   Replacing the 5-1/4" Drive Tray

Replacing the Cover

To replace the top cover, follow these steps:

1. Locate the tabs on the inside and back of the top cover and the slots on the back of the workstation. See Figure 3-28.

2. Face the front of the workstation.

   ■ Look through the slots as you lower the cover and move the tabs into place.
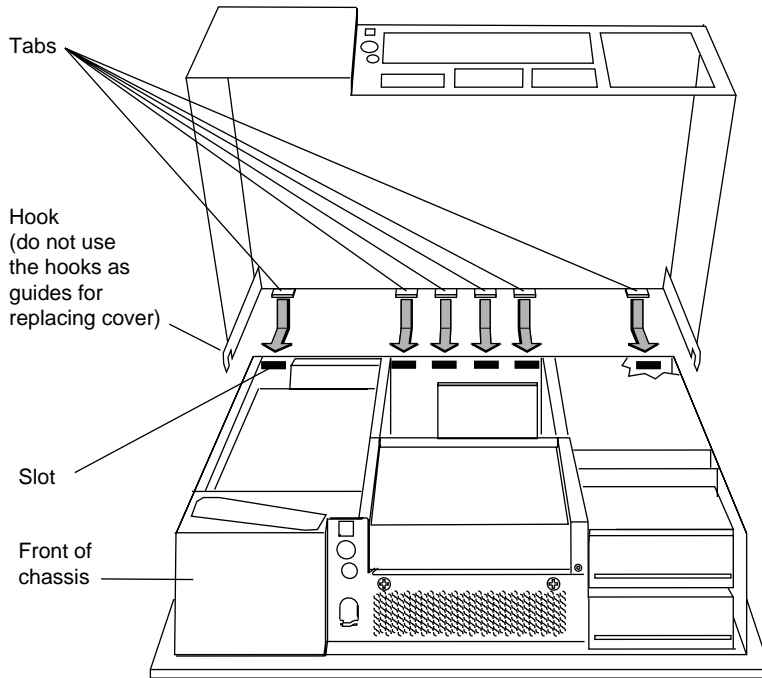
Figure 3-28   Replacing the Top Cover

   ■ Slide the tabs into the slots and pull the cover down until it snaps into place. The cover fits tightly over the workstation.

3. Replace the bezel.

   ■ Place the tabs on the bottom of the bezel in the grooves in the front of the chassis, as shown in Figure 3-29.

   ■ Tilt the bezel up until it snaps into place.
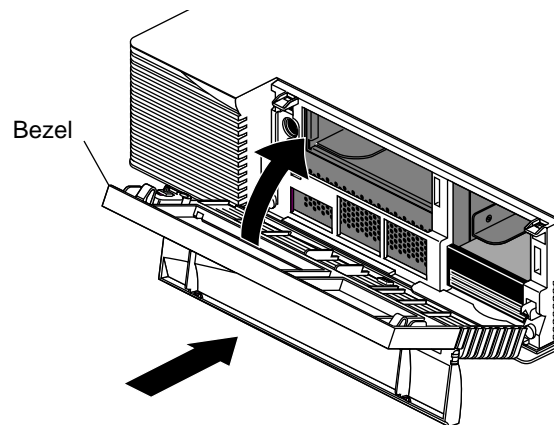
Figure 3-29   Replacing the Bezel

4. Reinstall the lockbar.

   ■ Slide it through the bezel and out the back of the workstation.

   ■ Reattach the lock.

5. Close the front cover.

6. Reconnect the power cable to the connector on the back of the Indigo[2] IMPACT workstation.

You are finished removing the SIMMs and are ready to power on the system.

Installing and Removing Standalone Option Boards

This chapter describes how to install and remove EISA and GIO option boards in your Indigo[2] IMPACT workstation.

Installing and Removing Standalone Option Boards

This chapter tells you how to install and remove EISA (Extended Industry Standard Architecture) and GIO (Graphics Input/Output) boards. EISA and GIO boards add functionality to your system through a standard bus.

Note: PC software device drivers are not compatible with the Indigo^2 IMPACT workstation.

Installing the Texture Memory Option Board

To remove or replace the Indigo^2 High IMPACT Texture Memory Option Board, see Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards."

Installing EISA and GIO Option Boards

To install an EISA or GIO option board, you must shut down the system, remove the cover, attach the wrist strap, install the option board, replace the cover, and start up the system.

Shutting Down and Powering Off the System

To shut down and power off the system, follow these steps:

1. Open the front cover.
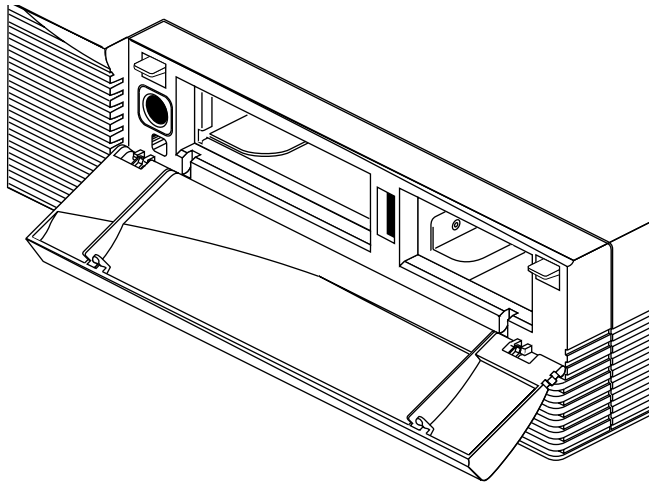
Figure 4-1   Opening the Front Cover

2. Press and release the power switch on the front of the workstation to shut down the software and power off the system.
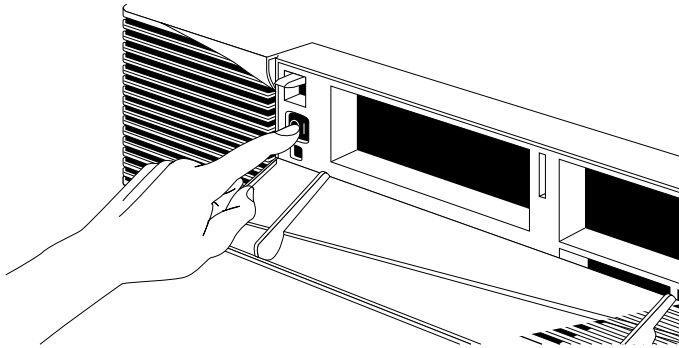
Figure 4-2   Powering Off the System

The system powers off automatically.

3. Disconnect the power cable from the back of the workstation.

4. Disconnect the monitor cable from the back of the workstation.

Removing the Cover

To remove the cover, follow these steps:

1. Remove the bezel.

   ■   Press down on the tabs on each side of the bezel, as shown in Figure 4-3.
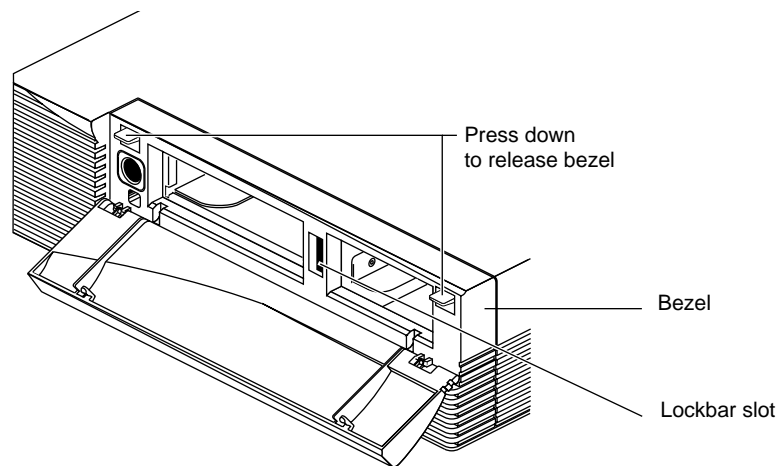
Figure 4-3   Releasing the Bezel

2. Remove the lockbar, if one is installed.

■ Remove the lock from the lockbar at the back of the workstation.

■ Slide the lockbar out through the bezel.

■ Pull the bezel down and away from the chassis.
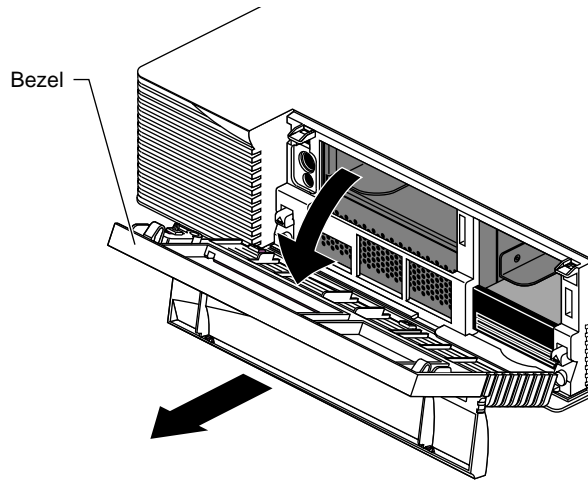
Bezel

Figure 4-4   Removing the Bezel

3. Remove the top cover.

    ■   Press up on the tabs on each side of the drive openings and pull up on the cover, as shown in Figure 4-5.

Press tabs
upward here
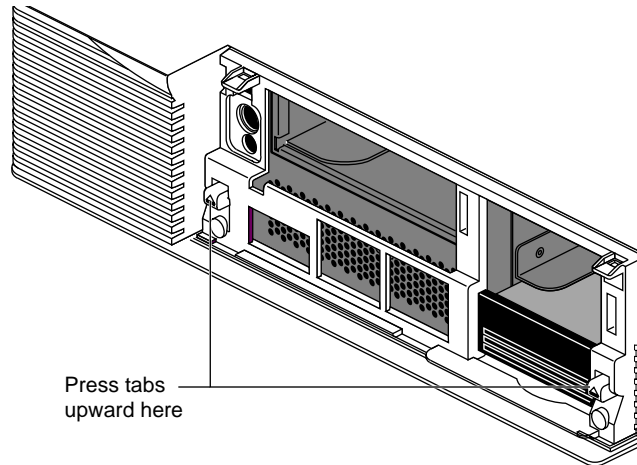
Figure 4-5   Releasing the Top Cover

    ■   Rotate the cover back and away from the chassis, as shown in Figure 4-6.
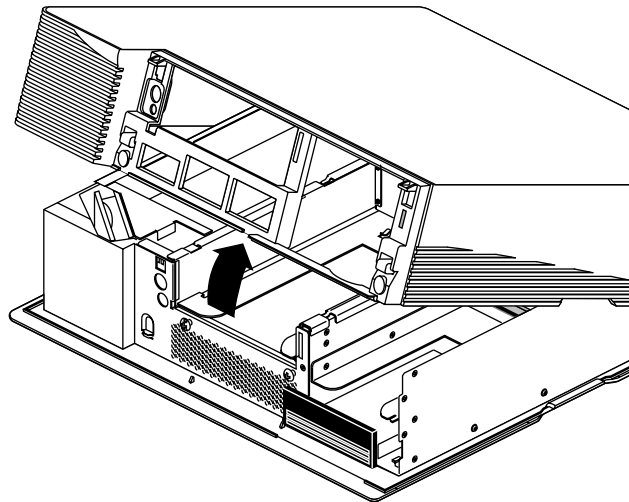
Figure 4-6   Removing the Top Cover

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Tip: If the cover is difficult to raise, check the locking levers of your drives to be sure they are fully locked. The levers should be pushed all the way to the right.

Installing an EISA or GIO Option Board

To install an EISA or GIO option board, follow these steps:

1. Ground yourself to a metal part of the Indigo^2 IMPACT chassis.

    Caution: The EISA or GIO board is extremely sensitive to static electricity; you must wear the wrist strap while installing it. The wrist strap prevents the flow of static electricity, which could damage the board.

    ■   Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.

    ■   Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

    ■   Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo^2 IMPACT workstation.

2. Move the workstation or position yourself so that you are facing the option slots.The option slots are located at the side and rear of the workstation, as shown in Figure 4-7.

Graphics board set

Midplane

Option slots for EISA or GIO boards

Rear of workstation
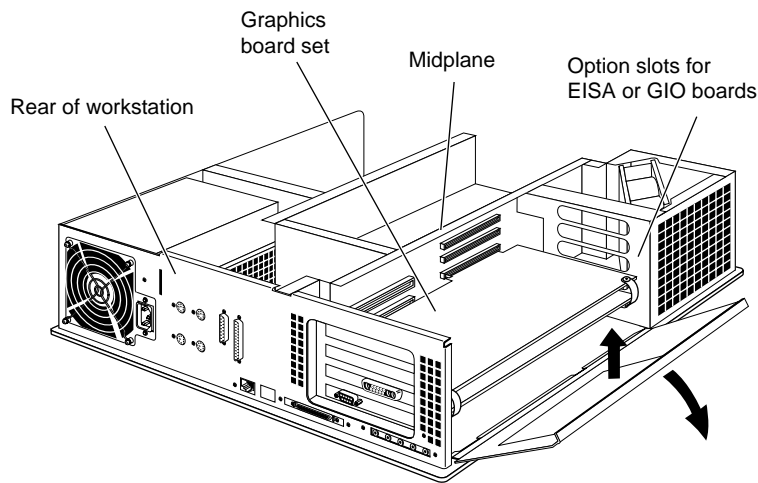
Figure 4-7   Locating the Option Slots

3. Open the metal panel located in front of the option slots by pulling up on the panel and lowering it.

4. Remove the retention pin on the right side of the boards, as shown in Figure 4-8.

    Note: Check the placement of the retention pin. It hangs in front of the board, not beside it.
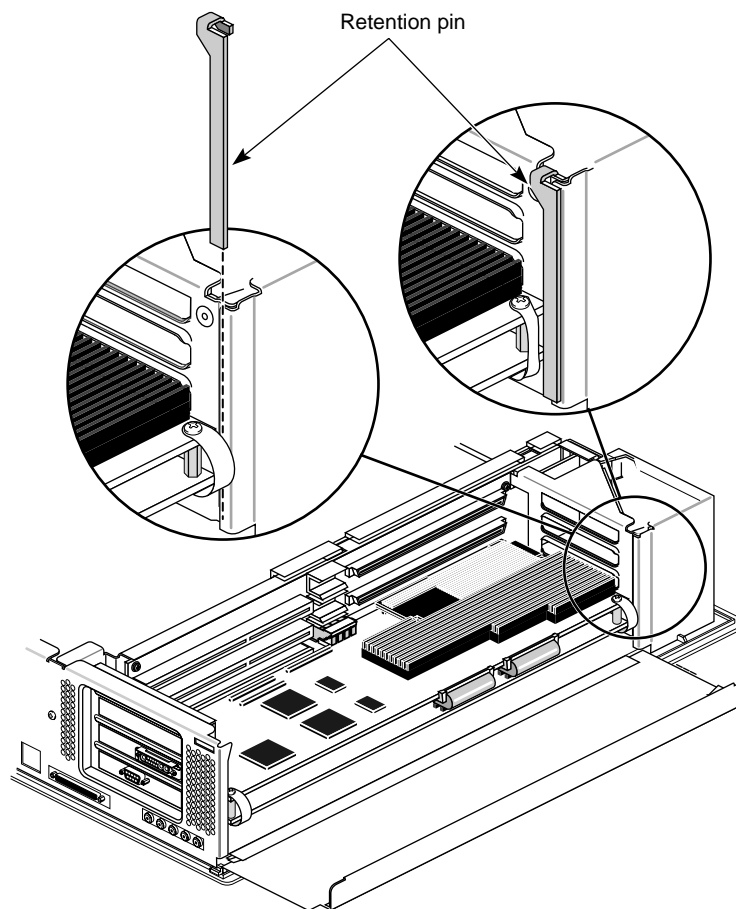
Retention pin

Figure 4-8   Removing the Retention Pin

5. Locate the EISA or GIO connector for the board or boards you are installing. Your Indigo[2] IMPACT workstation has two sets of option connectors, as shown in Figure 4-9.

   • three EISA connectors, located on the midplane toward the rear of the workstation

   • four GIO connectors, located on midplane, toward the front of the workstation
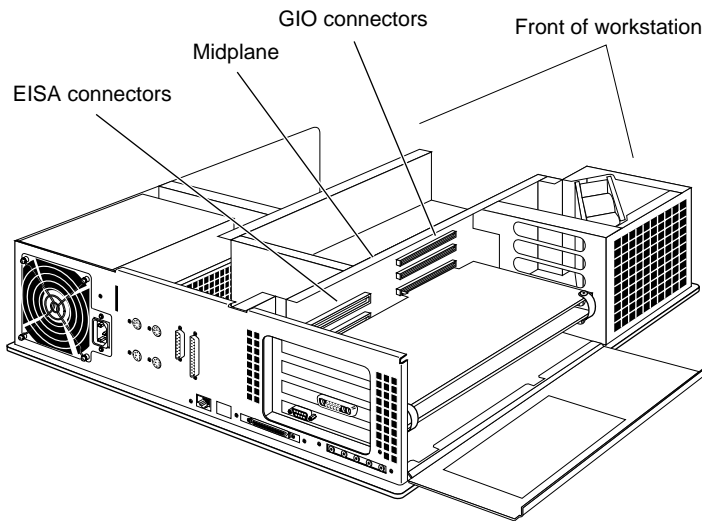
Figure 4-9   Locating the EISA and GIO Connectors

Installing Option Boards and the Solid IMPACT Graphics Board Set

Note: For proper placement of your option board in relation to the board set you purchased with your Indigo^2 IMPACT workstation, refer to Table 4-1, Table 4-2, Table 4-3, and Figure 4-10.

Table 4-1   Placement of Solid IMPACT Board and Option Boards

If you have this combination of Indigo^2 Solid IMPACT board and option boards:	Use these slots:
Solid IMPACT board plus 1 GIO option board	Place Solid IMPACT board in Slot B and GIO board in Slot C
Solid IMPACT board plus 1 GIO and 1 EISA option board	Place Solid IMPACT board in Slot B, GIO board in Slot C, and EISA board in Slot A
Solid IMPACT board plus 1 EISA board	Place Solid IMPACT board in Slot B and EISA board in Slot A or Slot C
Solid IMPACT board plus 2 EISA boards	Place Solid IMPACT board in Slot B and EISA boards in Slot A and Slot C
Solid IMPACT board plus 3 EISA boards	Place Solid IMPACT board in Slot D and EISA boards in Slots A, B, and C

Note: Although there are four GIO connectors, only one of each pair of GIO connectors, 0–0 or 1–1, may be used. You may connect only one GIO board or board set to one "0" connector in the pair 0–0, or to one "1" connector in the pair 1–1. See Figure 4-10.
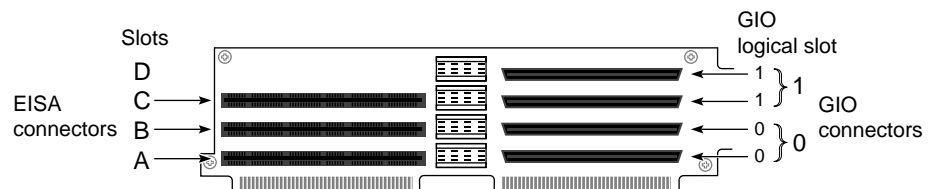
Figure 4-10   Identifying Board Slots

Installing Option Boards and the High IMPACT Graphics Board Set

Install the board set in the same slots as before. If you need help locating the correct slots for your board set, see Table 4-2.

Table 4-2   Placement of Indigo^2 High IMPACT Board Set and Option Boards

If you have this combination of Indigo^2 High IMPACT and option boards:	Use these slots:
Indigo^2 High IMPACT (2 board set) plus 1 GIO option board	Place Indigo^2 High IMPACT board set in Slots A and B, and GIO option board in Slot C
Indigo^2 High IMPACT board set plus 1 EISA option board	Place EISA option board in Slot A, and Indigo^2 High IMPACT board set in Slots B and C
Indigo^2 High IMPACT board set plus 2 EISA option boards	Place EISA boards in Slots A and B and the Indigo^2 High IMPACT board set in Slots C and D
Indigo^2 High IMPACT board set plus 1 GIO option board and 1 EISA option board	Place EISA option board in Slot A, Indigo^2 High IMPACT board set in Slots B and C, and GIO option board in Slot D

Installing Option Boards and the Maximum IMPACT Graphics Board Set

Install the board set in the same slots as before. If you need help locating the correct slots for your board set, see Table 4-3

Table 4-3   Placement of Maximum IMPACT Board Set and Option Boards

If you have this combination of Indigo^2 Maximum Board Set and option boards:	Use these slots:
Maximum IMPACT Board set plus 1 GIO option board	Place Maximum IMPACT board set in Slots A, B, and C and GIO option board in Slot D
Maximum IMPACT board set plus 1 EISA option board	Place EISA option board in Slot A and Maximum IMPACT board set in Slots B, C, and D

Look at the left end of your board and find the port. Determine where the port will exit the chassis when the board or board set is inserted into the option slot.
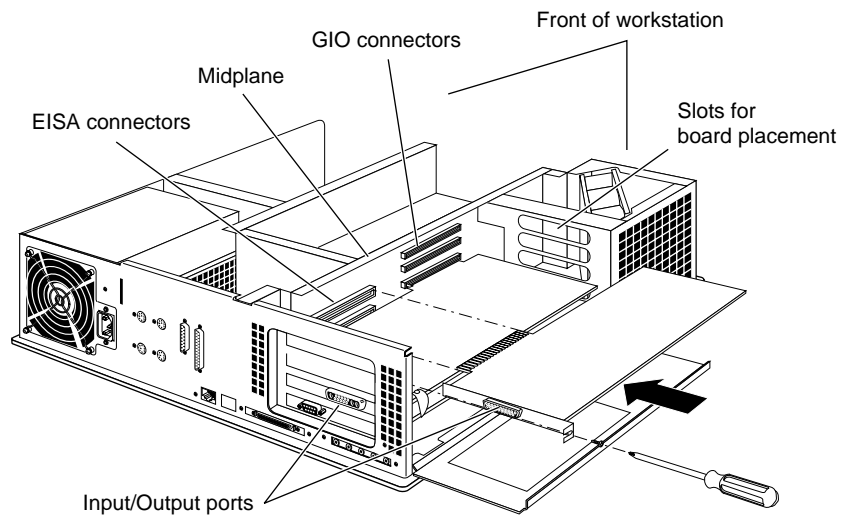
Figure 4-11   Placement of Option Board

1. Remove the corresponding I/O panel over the slot. This makes the port accessible.

   ■ Remove the screw that attaches the I/O panel to the chassis. The screw opening is located on the metal bracket on the upper left side of the board.

   ■ Save the screw to secure the option board after it is installed.
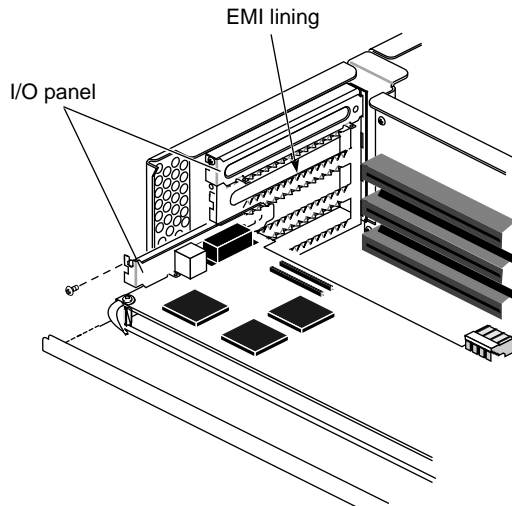
Figure 4-12   Removing the I/O Panel

If your site has multiple Indigo^2 IMPACT workstations, it's a good idea to save at least one set of I/O panels to reinstall in the workstation should you need to remove an option board.

2. Install the board.

   ■ Align the right side of the board with the metal grooves on the right.

   ■ Align the Input/Output port with the port opening that allows access to the exterior of the chassis. Push the board into the slot until the connector on the back of the board is securely connected to the connector on the midplane, as shown in Figure 4-13.

3. Insert and tighten the screw that holds the board to the chassis.

   The screw opening is located on the metal bracket on the upper left side of the board. See Figure 4-13.
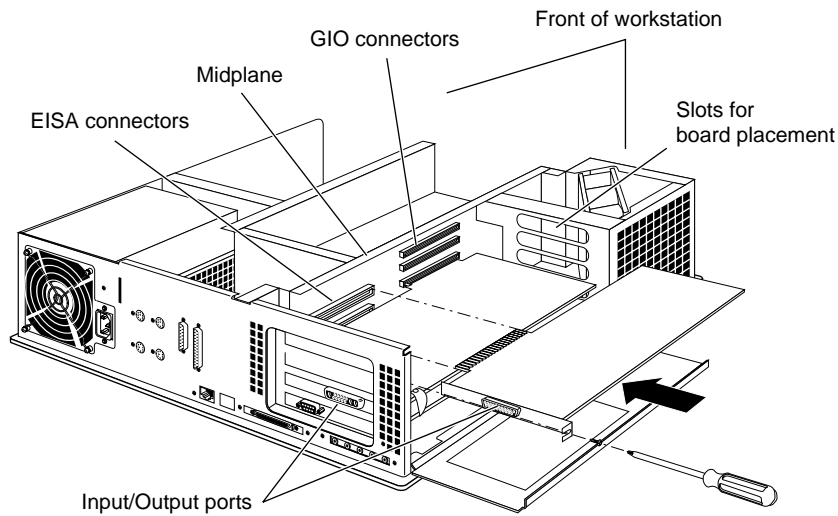
Figure 4-13   Installing the Option Board

4. Hang the retention pin so that it sits in front of the board set. The retention pin prevents the board set from moving away from the connectors. See Figure 4-14.
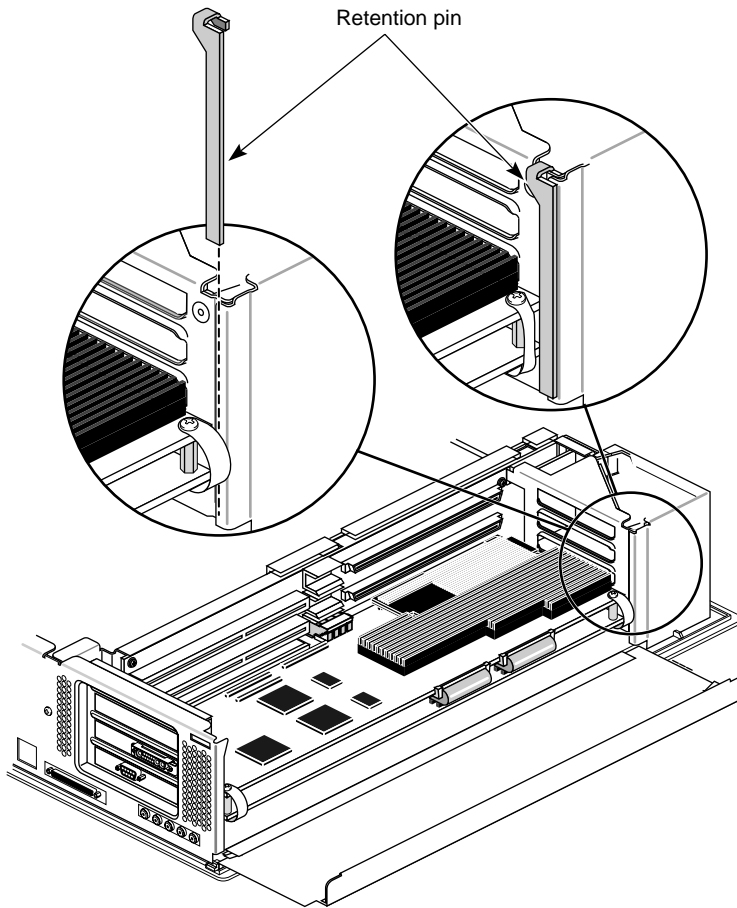
Figure 4-14   Replacing the Retention Pin

Tip: Use the retention pin as a plumb line to determine if the board set is properly seated. If the pin is tilted, push on the board set until it is properly connected.

5.   Tip the metal panel up until it snaps into place, as shown in Figure 4-15.
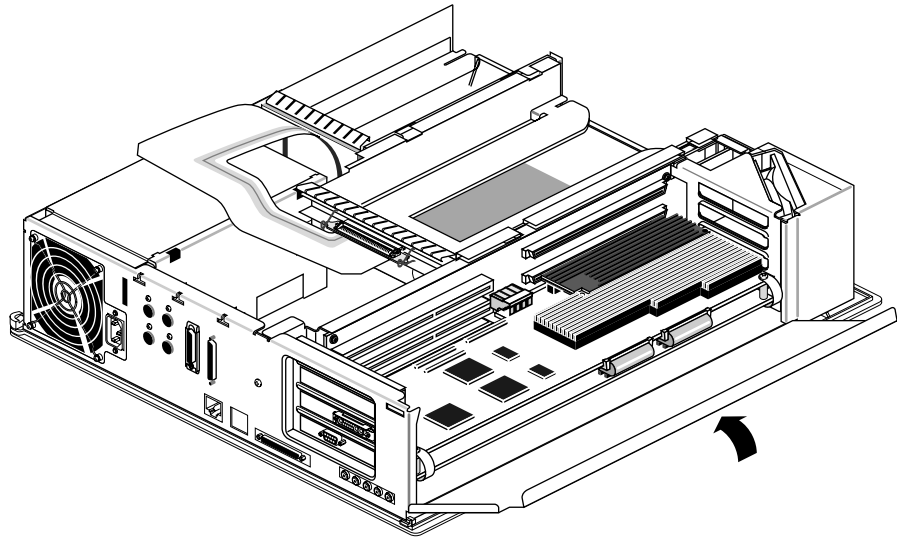
Figure 4-15   Closing the Metal Panel in Front of the Option Slots

Replacing the Cover

To replace the cover, follow these steps:

1. Locate the tabs on the inside and back of the top cover and the slots on the back of the workstation. See Figure 4-16.

2. Face the front of the workstation.

   ■ Look through the slots as you lower the cover and move the tabs into place.

   ■ Slide the tabs into the slots and pull the cover down until it snaps into place. The cover fits tightly over the workstation.
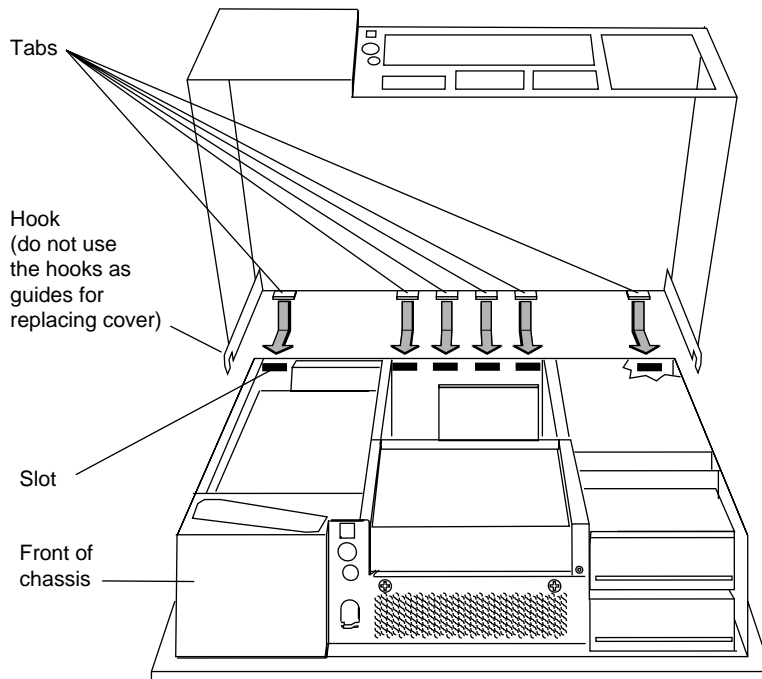
Figure 4-16   Replacing the Top Cover

3. Replace the bezel.

    ■   Place the tabs on the bottom of the bezel in the grooves in the front of the chassis, as shown in Figure 4-17.

4. Tilt the bezel up until it snaps into place.

5. Reinstall the lockbar, if you removed it.

    ■   Slide it through the bezel and out the back of the workstation.

    ■   Reattach the lock.

    ■   Close the front panel of the bezel.
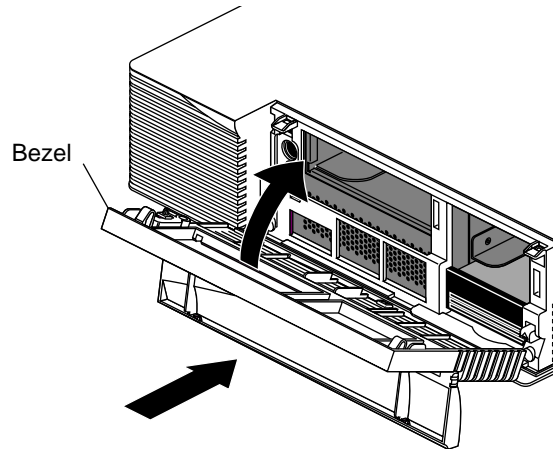
Bezel

Figure 4-17   Replacing the Bezel

Reconnect the power cable and monitor cable to the connector on the back of the workstation.

You are finished installing the option board and are ready to turn on the workstation.

Turning On the Workstation

To turn on the workstation, follow these steps:

1. Turn on the monitor.

    The monitor's power switch is on the front of the monitor in the lower right corner. The LED next to the switch lights up when you turn on the 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 4-18.
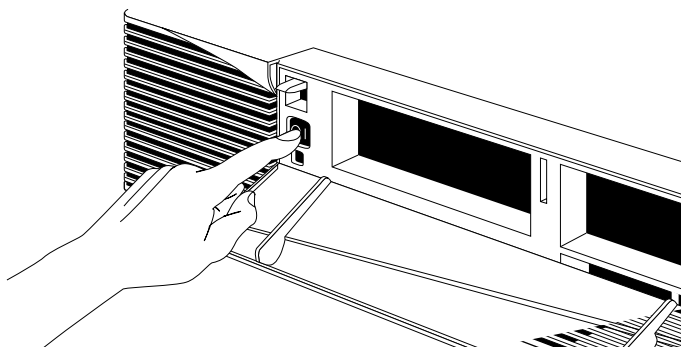
Figure 4-18   Turning On the Indigo^2 IMPACT Workstation

Removing EISA and GIO Option Boards

To remove a GIO or EISA option board, follow these steps:

1. For instructions on how to shut down and power off the system, see "Shutting Down and Powering Off the System" on page 80.

2. For instructions on how to remove the cover, see "Removing the Cover" on page 81.

3. Ground yourself to a metal part of the Indigo^2 IMPACT workstation.

    ■   Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.

    ■   Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

    ■   Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo^2 IMPACT workstation.

    Caution: The EISA or GIO board is extremely sensitive to static electricity; you must wear the wrist strap while installing it. The wrist strap prevents the flow of static electricity, which could damage the board.

4. Move the workstation or position yourself so that you are facing the option slots.The option slots are located on the side toward the rear of the workstation. See Figure 4-19.

5. Open the metal panel located in front of the option slots by pulling up on the panel and lowering it down, as shown in Figure 4-19.
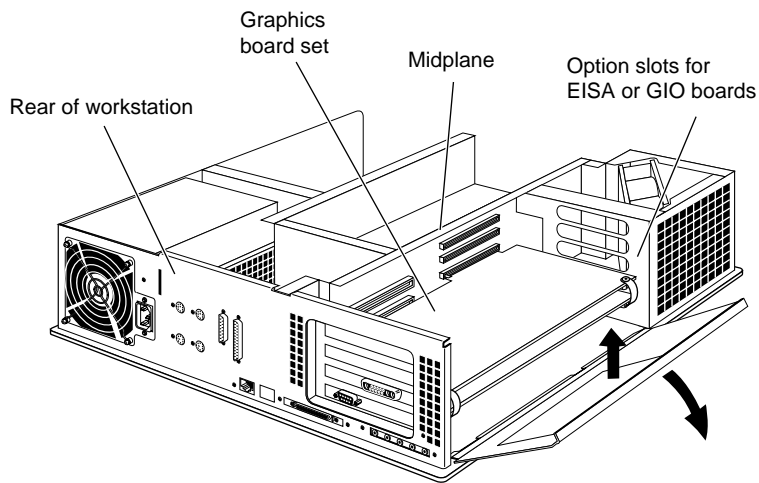
Figure 4-19   Opening the Metal Panel in Front of the Option Slots

Note: Look at the placement of the retention pin before you remove it. It hangs between the edge of the board set and the metal panel you just opened.

6. Remove the retention pin, as shown in Figure 4-20.
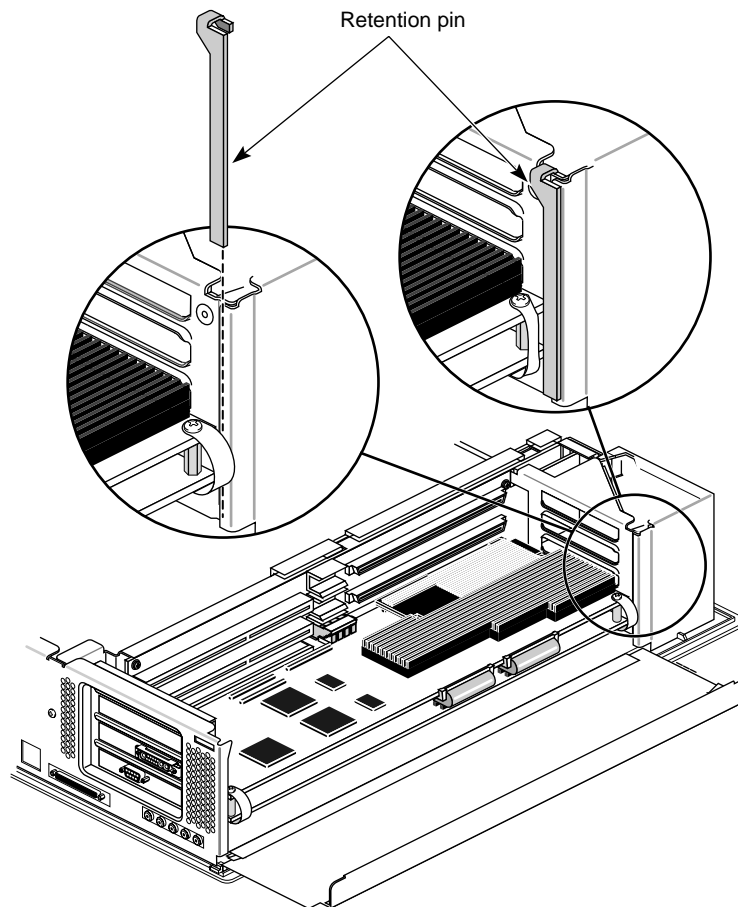
Figure 4-20   Removing the Retention Pin

7. Remove the screw attaching the option board to the workstation slot, as shown in Figure 4-21. The screw is located on the metal bracket on the upper left side of the board.
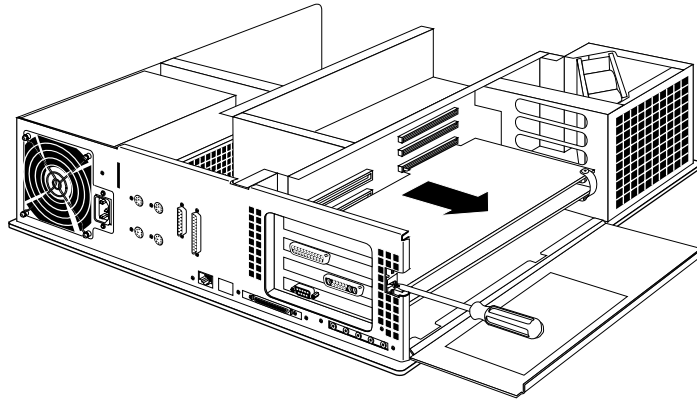
Figure 4-21 Unscrewing the Option Board From the Indigo^2 IMPACT Chassis

8. Pull the board out of the workstation.

   ■ Grasp the board with both hands, and pull it out of the slot.

   ■ Set the board down on a flat, antistatic surface so that the side with the chips on it faces up.

9. If you are replacing the board, see "Installing an EISA or GIO Option Board" on page 84.

10. If you are not immediately replacing the board, install the metal I/O panel. You need a Phillips screwdriver to do so.

    Caution: The I/O panel is required to keep your graphics boards at the appropriate temperature and to prevent interference with other electrical equipment.

    ■ Slide the metal I/O panel into the slot on the left side of the option slots.

    ■ Place the screw into the opening on the chassis, and tighten the metal I/O panel to the chassis using the Phillips screwdriver.
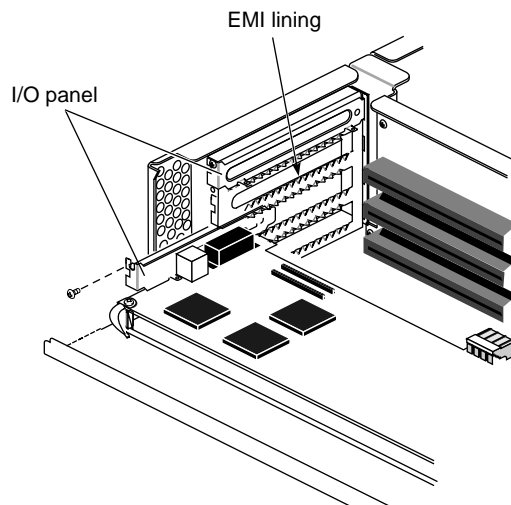
Figure 4-22   Replacing the Metal Port Cover

11. Hang the retention pin so that it sits in front of the board set. The retention pin prevents the board set from moving away from the connectors. See Figure 4-23.
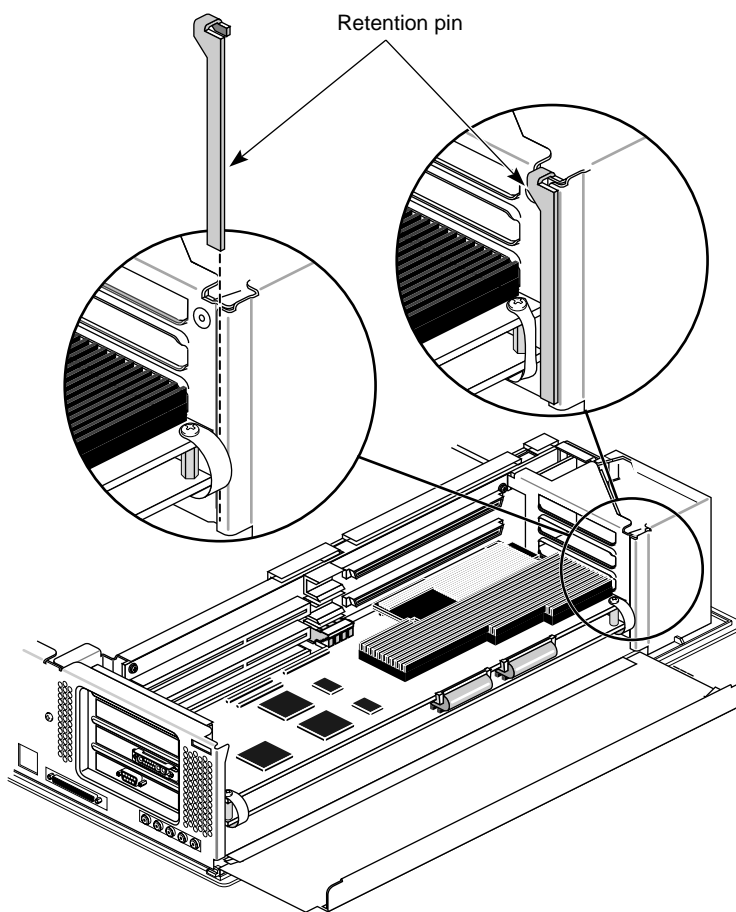
Retention pin

Figure 4-23   Replacing the Retention Pin

12. Replace the cover. For instructions, see "Replacing the Cover" on page 94.

You are finished removing the option board.

To turn on the workstation, see "Turning On the Workstation" on page 96.

Identifying, Installing, and Removing Graphics Boards and Attached Option Boards

This chapter tells you how to identify, install, and remove graphics board sets and attached option boards.

This chapter also provides information on upgrading from an IMPACT Ready Indigo^2 workstation to an Indigo^2 IMPACT workstation.

Identifying, Installing, and Removing Graphics Boards and Attached Option Boards

The Indigo^2 IMPACT workstation allows several configurations of graphics boards, texture memory option boards, and option boards attached by standoffs and cables to the graphics board set.

This chapter tells you how to

- identify graphics board(s) and option boards
- remove and replace option boards attached to the graphics boards
- upgrade graphics boards
- install and remove texture memory option boards
- install and remove graphics boards
- upgrade from an IMPACT Ready workstation to an Indigo^2 IMPACT workstation

Note: If diagnostics have identified a faulty part, remove the faulty part and see Chapter 9, "Ordering Replacement Parts" on page 256.

Shutting Down the System

To shut down the system, follow these steps:

1. Open the front cover.
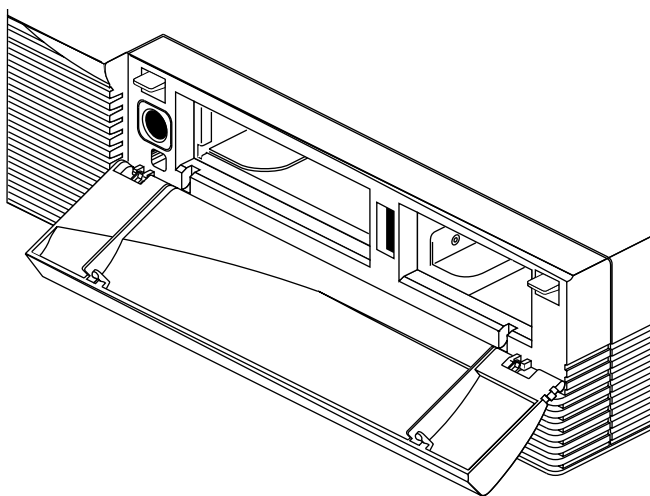
Figure 5-1   Opening the Front Cover

2. Press and release the power switch on the front of the workstation to shut down the software and power off the system.

    The system powers off automatically.
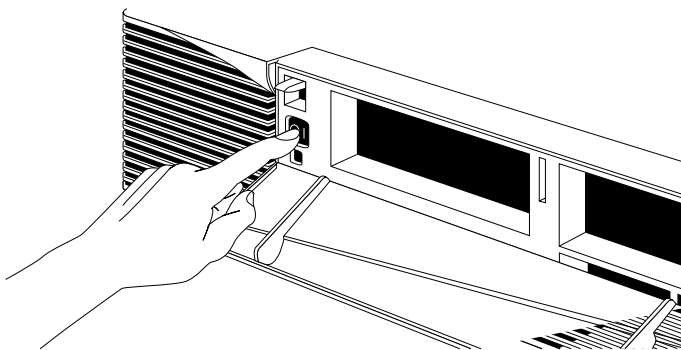
Figure 5-2   Powering Off the System

3. Press the monitor power switch to turn off your monitor.

4. Disconnect any cables from the back of the Indigo^2 IMPACT workstation.

Removing the Cover

Once the system is shut down and all of the cables are disconnected, follow these steps:

1. Remove the lockbar if you have one installed.

    ■ Remove the lock from the lockbar at the back of the workstation.

    ■ Pull the lockbar through the bezel and out.

2. Remove the bezel.

    ■ Press down on the tabs on each side of the bezel, as shown in Figure 5-3.

Press down
to release bezel

Bezel

Lockbar slot
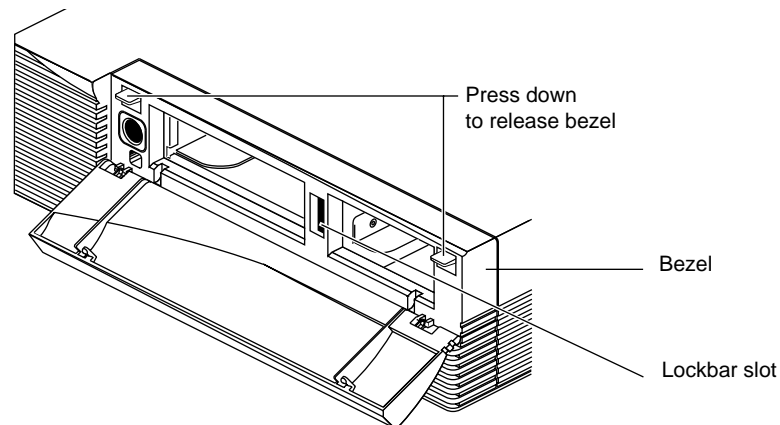
Figure 5-3   Releasing the Bezel

■   Pull the bezel away from the chassis.
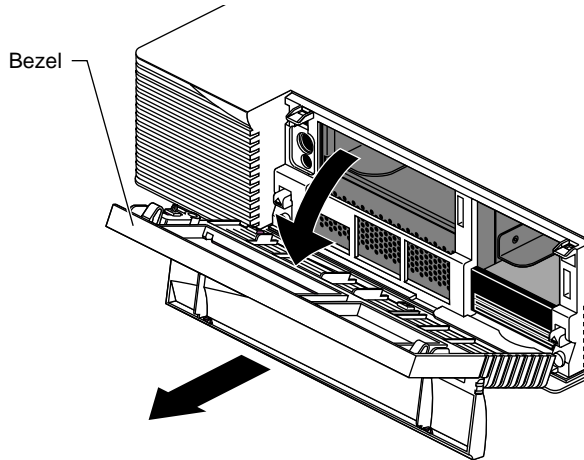
Figure 5-4   Removing the Bezel

3.   Remove the top cover.

■   Press up on the tabs on each side of the drive openings, as shown in Figure 5-5.
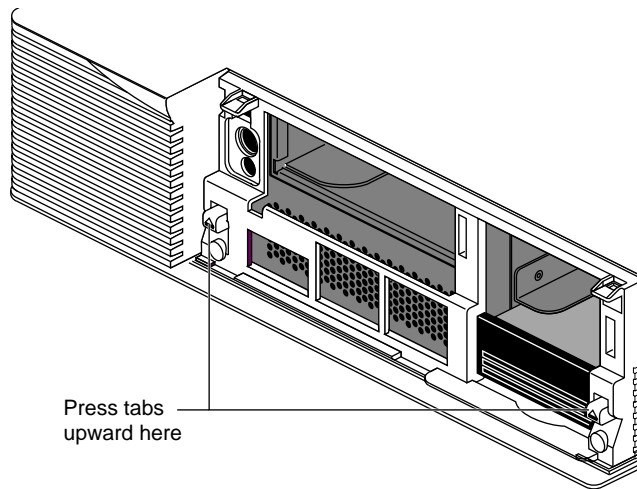
Figure 5-5   Releasing the Top Cover

■ Pull up on the cover and rotate it back and away from the chassis, as shown in Figure 5-6.
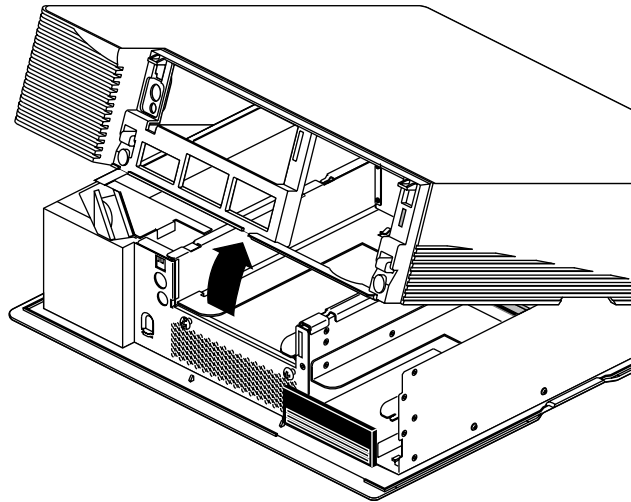
Figure 5-6   Removing the Top Cover

Tip: If the cover is difficult to raise, check the locking levers of your drives to be sure they are fully locked. The levers should be pushed all the way to the right.

Attaching the Wrist Strap

Wear the wrist strap to prevent the flow of static electricity, which can damage the board.

Caution: The components inside the Indigo[2] IMPACT workstation are extremely sensitive to static electricity; you must wear the wrist strap while replacing parts inside the workstation.

To attach the wrist strap, follow these steps:

1. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.

2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

3. Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo^2 IMPACT workstation.

Removing and Replacing the Indigo² IMPACT Graphics Boards

To remove the Indigo^2 Solid IMPACT, High IMPACT, or Maximum IMPACT graphics boards, follow these steps:

1. Make sure the wrist strap is attached to a metal part of the chassis.

2. Move the workstation or position yourself so that you are facing the expansion slots, as shown in Figure 5-7.

3. Open the metal panel in front of the expansion slots by pulling up on the panel and lowering it.

    Caution: The heat sinks in your Indigo^2 IMPACT workstation become hot when the workstation is running. Take a coffee break for a few minutes while the graphics boards cool before you begin working with them.
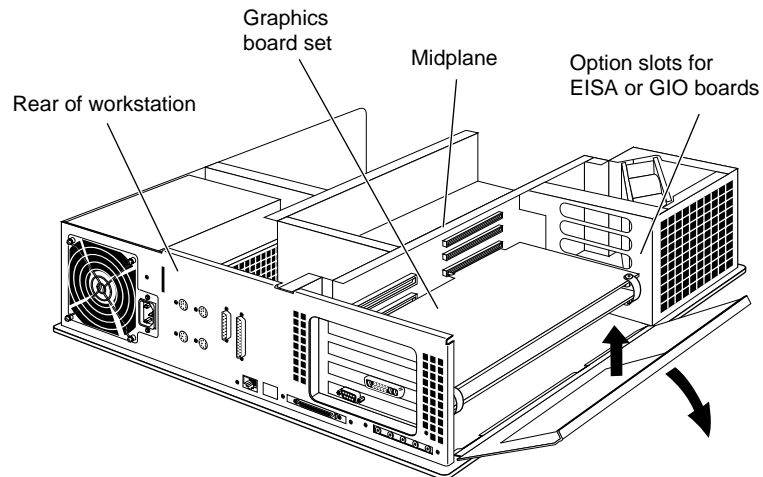
Figure 5-7   Lowering the Metal Panel in Front of the Expansion Slots

Note: Illustrations show the High IMPACT board set, but are true for the Solid IMPACT graphics board, the High IMPACT and Maximum IMPACT graphic board sets.

Note: Any option boards and your Indigo^2 Solid IMPACT, Indigo^2 High IMPACT, or Maximum IMPACT board set must be replaced in the same slots.

4. Remove the screws attaching the board set to the workstation slots as shown in Figure 5-8. The number of screws to be removed equals the number of boards you are removing.

    The screws are located on the metal extension on the left side of each board.

    ■   Loosen each screw with the Phillips screwdriver.

    ■   Unscrew and remove the screws with your hand.

    The screws are very small. If you drop a screw into the chassis, retrieve it to prevent shorting the system.
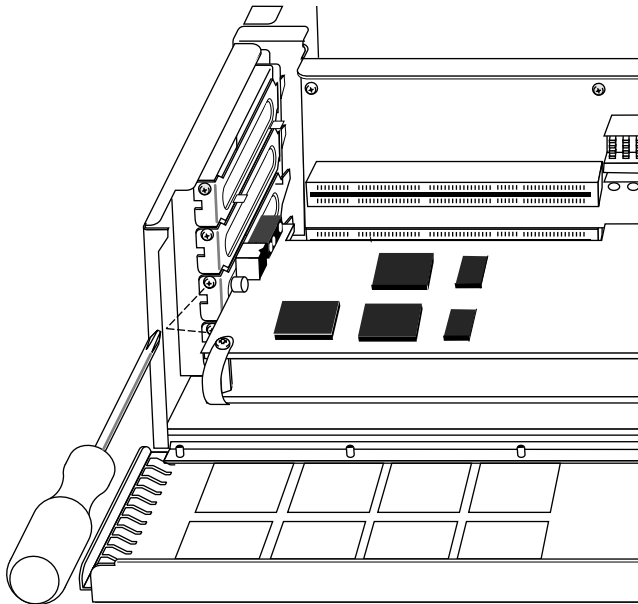
Figure 5-8   Removing the Screws From the Metal Extension

Note: You will have to remove one screw from a Solid IMPACT graphics board and three screws from a Maximum IMPACT graphics board set.

5. Remove the retention pin from the workstation.

    ■   Grasp the retention pin on the right front end of the board set and pull it up and off. See Figure 5-9.

    Note: Check the placement of the retention pin. It hangs in front of the board, not beside it.
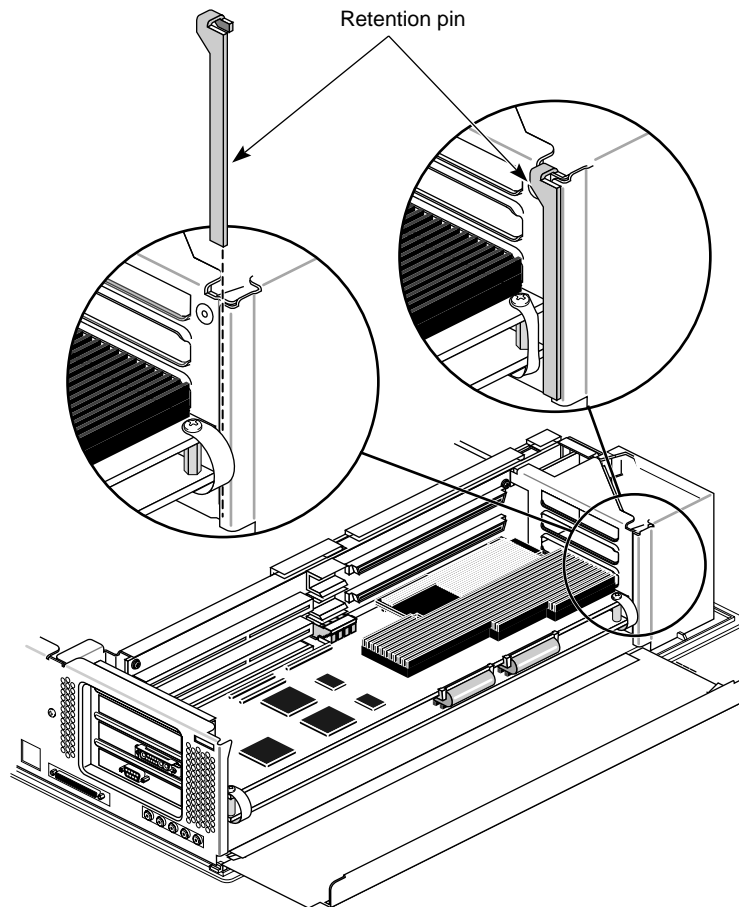
Retention pin

Figure 5-9   Releasing the Retention Pin

6. Remove the Solid IMPACT, High IMPACT, or Maximum IMPACT board set.

    ■   Place the your index fingers behind the plastic loops on each side of the board set as shown in Figure 5-10.

    ■   Brace your knuckles and thumbs on the chassis frame and pull the board set out of its slots. You may need to use some force.

    ■   Place the board set down on a flat, antistatic surface so the side with the chips faces up. An empty antistatic bag or a clean, dry desktop works well.
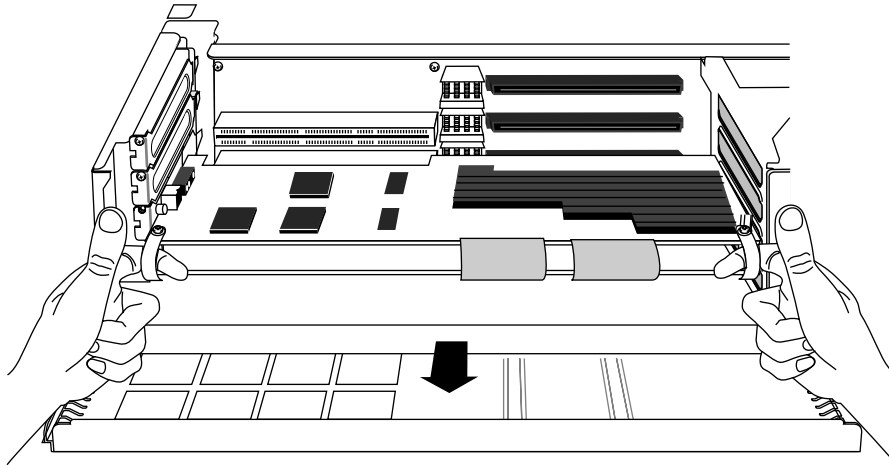
Figure 5-10   Removing the Board Set From the Chassis

Note: If you received a Solid IMPACT graphics board without pull straps,

■   Grasp the edges of the graphics board with your thumb and fingers and pull the board from the chassis.

■   Place the board set down on a flat, antistatic surface so the side with the chips faces up. An empty antistatic bag or a clean, dry desktop works well.

If you need help identifying and removing option boards from the graphic board sets, turn to "Identifying, Removing, and Installing Option Boards Attached to Graphic Board Sets" on page 115.

If you do not need help removing option boards from the graphics board set, turn to:

Identifying, Removing, and Installing Option Boards Attached to Graphic Board Sets

This section provides information to help you identify option boards connected to the graphics board or graphics board sets, and properly disconnect and reconnect the cables and standoffs.

Other option boards do not connect to the graphics board set by cables or standoffs. These option boards sit in a board slot independent of other boards.

This section tells you how to

- identify option boards and the graphics board or graphics board sets
- remove option boards from the graphics board or graphics board set
    - remove any ribbon cables
    - remove four screws or standoffs
    - remove any flex cables
    - remove the boards
- reinstall the boards, standoffs, cables, and screws

Identifying the Option Boards and Graphic Board Sets

The instructions in this section provide annotated illustrations to help you identify option boards and graphics board sets in your workstation.

1. Use the illustrations to identify the boards in your workstation.

2. Use the directions below the illustrations to move to the appropriate part of this manual to complete your task.

Stereo
connector

Monitor
connector
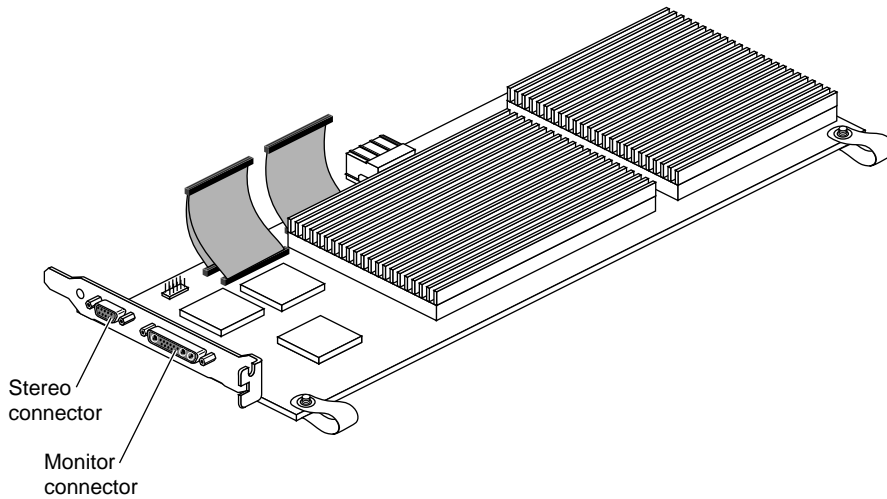
Figure 5-11   Solid IMPACT Graphics Board

3. Your Solid IMPACT graphics board is always the bottom board attached by standoffs and cables to option boards.

   Note: The Solid IMPACT board has a "3 board pull strap."

If you have only a Solid IMPACT graphics board with no option boards, go to step 11 on page 127.

Figure 5-12 shows the maximum number of option boards that can be attached to the Solid IMPACT graphics board by standoffs and cables. You may see one option, an option with a daughter board, or two option boards as other possible connected combinations.
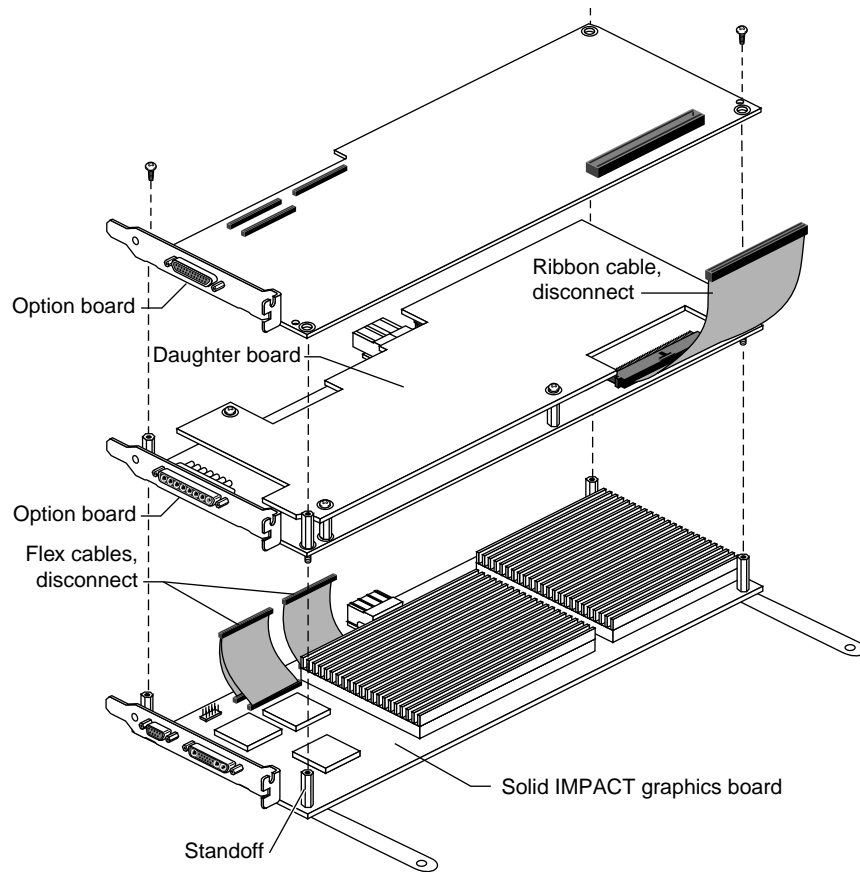
Figure 5-12   Solid IMPACT Graphics Board With Connected Option Boards

Note: The daughter board in Figure 5-12 is not attached by *corner* standoffs. You do not need to remove the daughter board from an option board when removing the option board to reach the graphics board set.

If you have a Solid IMPACT graphics board set with options, go to "Removing Standoffs and Cables to the Option Boards" on page 122.

Your graphics board set is always the bottom two boards (High IMPACT graphics board set) or three boards (Maximum IMPACT graphics board set) connected by corner standoffs and cables. See Figure 5-13.
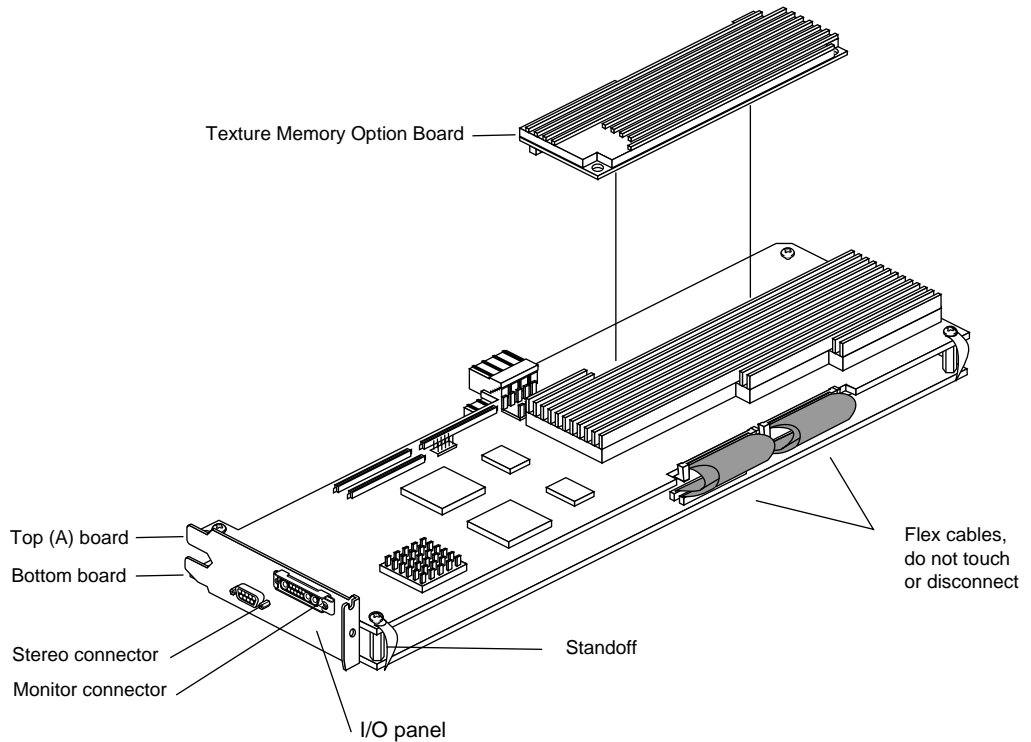
Figure 5-13   High IMPACT Graphics Board Set With Texture Memory Option Board

Tip: Pull straps are labeled "2 board pull strap" for the High IMPACT graphics board set, and "3 board pull strap" for the Solid IMPACT and Maximum IMPACT graphics board set. Board sets with option boards have 3 or 4 board straps.

Note: The daughter board in Figure 5-14 is not attached by *corner* standoffs. You do not need to remove the daughter board from an option board when removing the option board to reach the graphics board set.

If you have only a High IMPACT graphics board set with no option boards, go to step 11 on page 127.
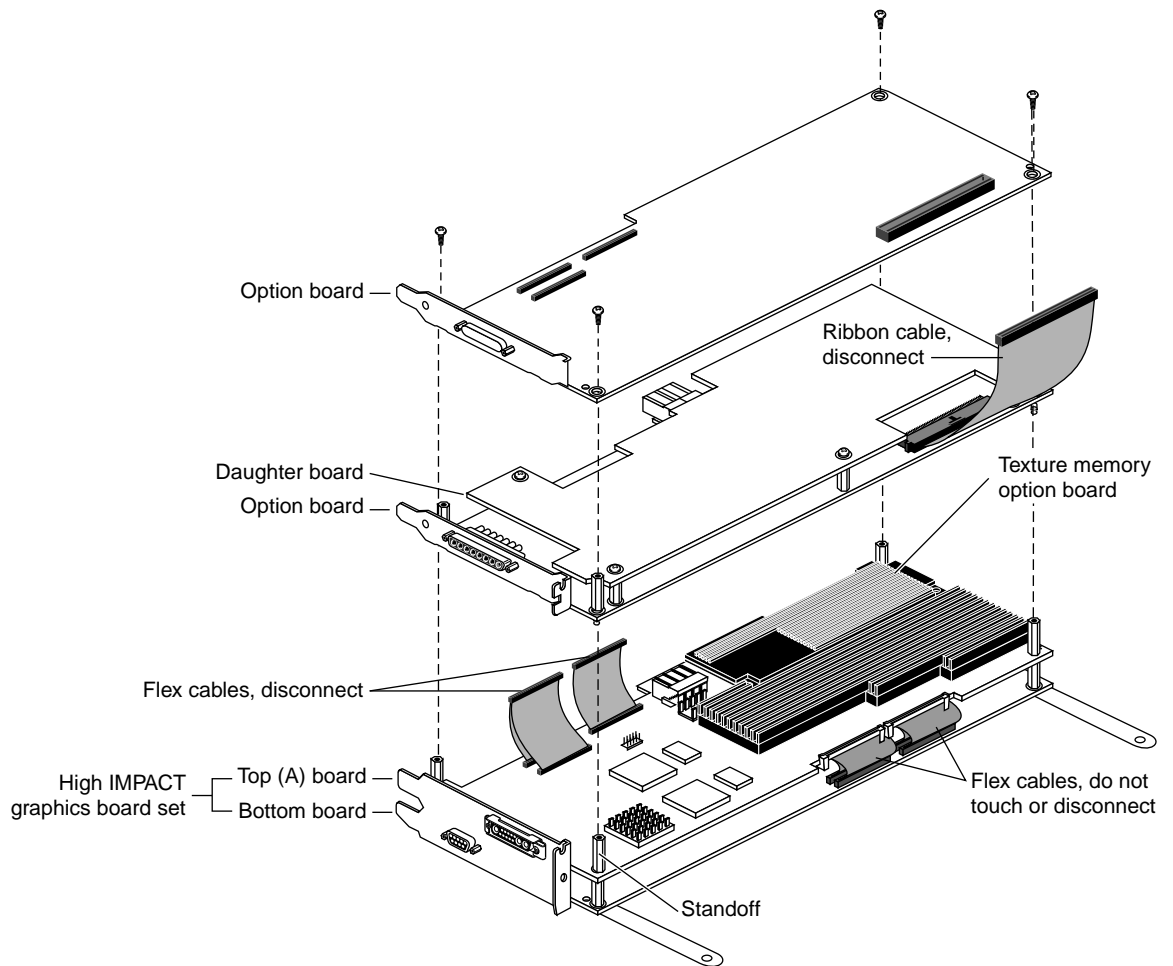
Figure 5-14   High IMPACT Graphics Board Set With Connected Option Boards

Figure 5-14 shows the maximum number of option boards that can be attached to the High IMPACT graphics board set by standoffs and cables. You may see one option, an option with a daughter board, or two option boards as other possible connected combinations.

If you have a High IMPACT graphics board set with options, go to "Removing Standoffs and Cables to the Option Boards" on page 122.
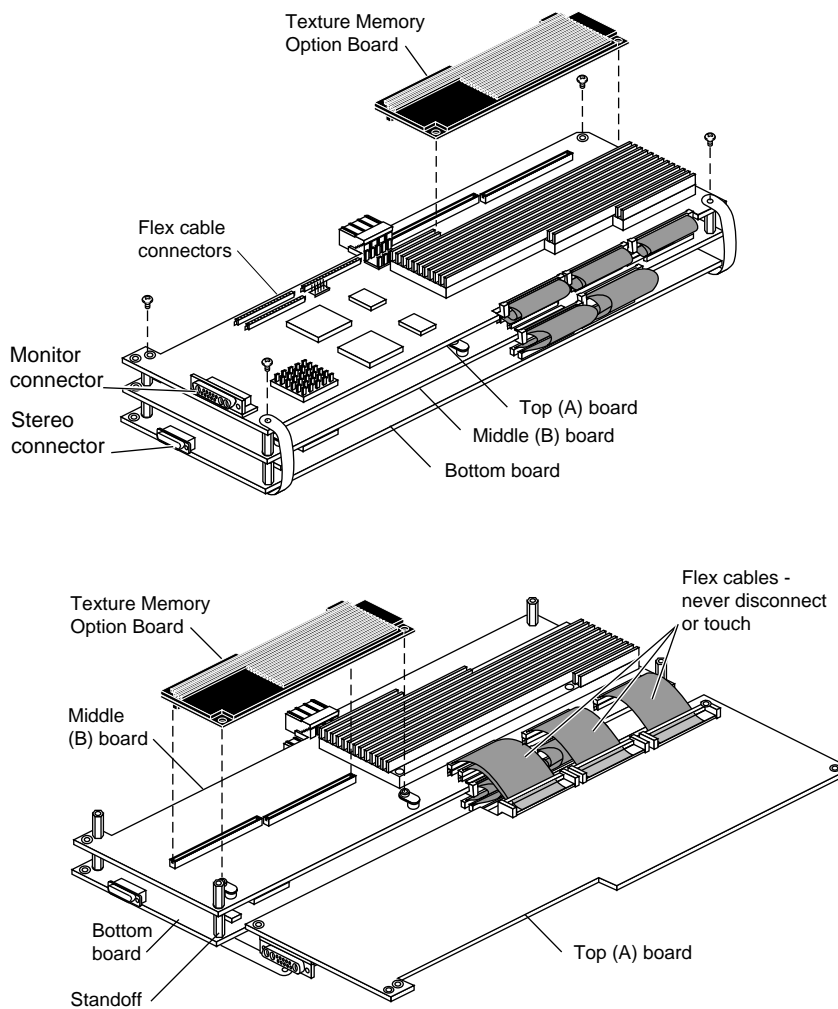
Figure 5-15   Maximum IMPACT Graphics Board Set With Texture Memory Option Boards

Tip: Pull straps are labeled "3 board pull strap" for the Maximum IMPACT graphics board set; sets with attached option boards have 4 board straps.

If you have only a Maximum IMPACT graphics board set with no option boards, go to step 11 on page 127.
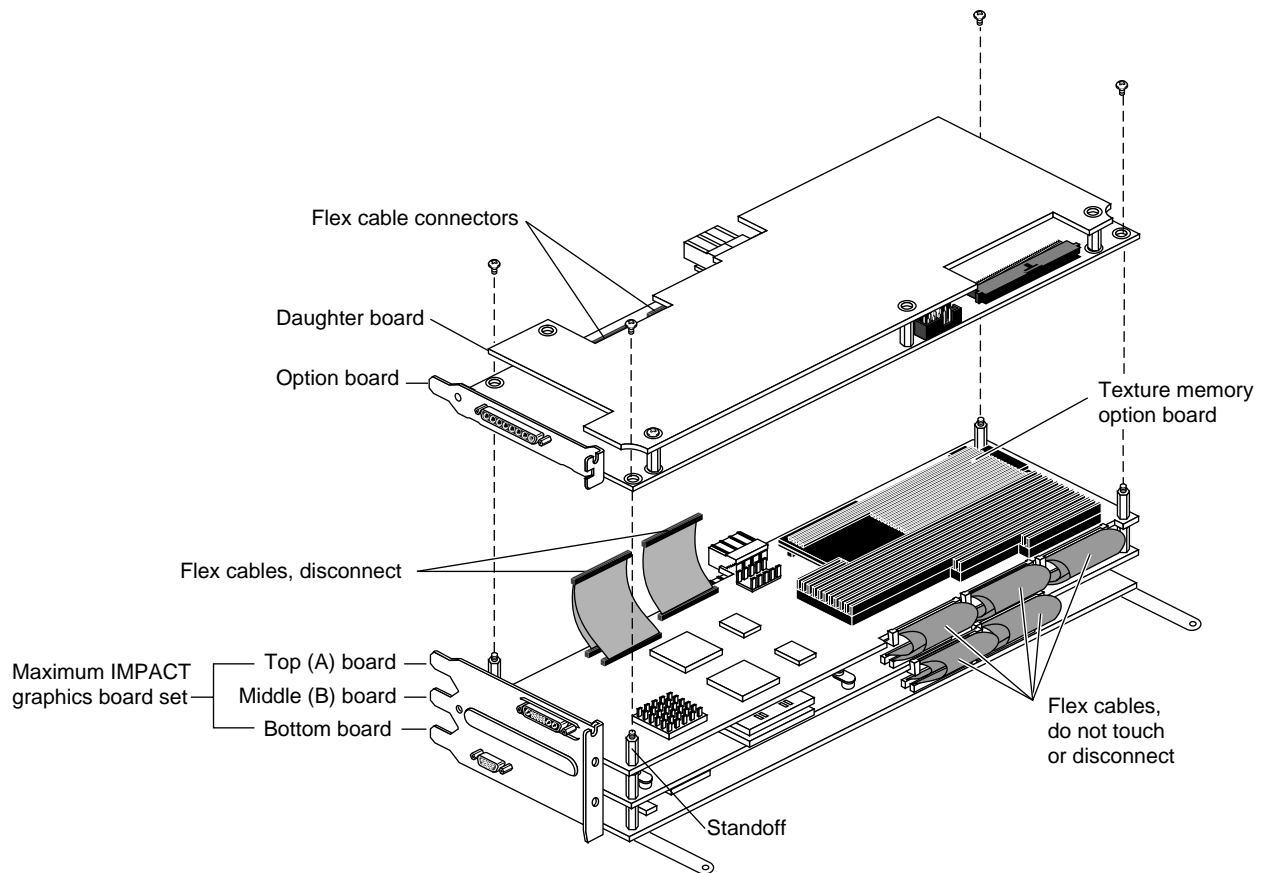
Figure 5-16 Maximum IMPACT Graphics Board Set With Texture Memory Option Boards and Connected Option Board

The Maximum IMPACT graphics board set can be attached by standoffs to one option board, or one option board and daughter board.

Note: The daughter board is not attached by corner standoffs. You do not need to remove the daughter board from an option board when removing the option board to reach the graphics board set.

If you have a Maximum IMPACT graphics board set with options, turn to "Removing Standoffs and Cables to the Option Boards" on page 122.

Removing Standoffs and Cables to the Option Boards

This section tells you how to remove standoffs and cables connecting the option boards and graphics board sets. You need a Phillips screwdriver to complete the task. You may find a standoff wrench, shown in Figure 5-17, useful.
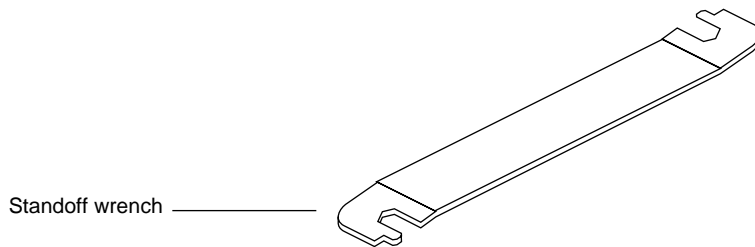
Standoff wrench ─────────

Figure 5-17   Standoff Wrench

1. Decide on a pattern for laying the boards you remove on an antistatic surface so that you can replace them in the proper order.

2. Disconnect any ribbon cable from the top board. See Figure 5-18. If you have no ribbon cable, go to step 3. Ribbon cable connectors push together and pull apart.

■ Pinch the connector on the sides and pull away. See Figure 5-18.
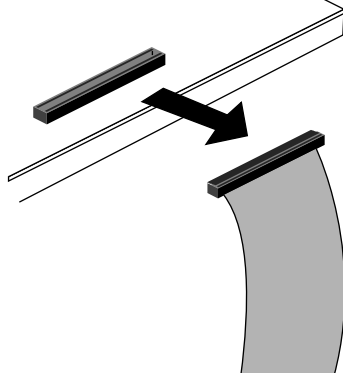
Figure 5-18   Disconnecting the Ribbon Cable

3. Unscrew the corner standoff screws from the top four corners. See Figure 5-19. If the standoff beneath the screw spins, hold it steady with the standoff wrench.
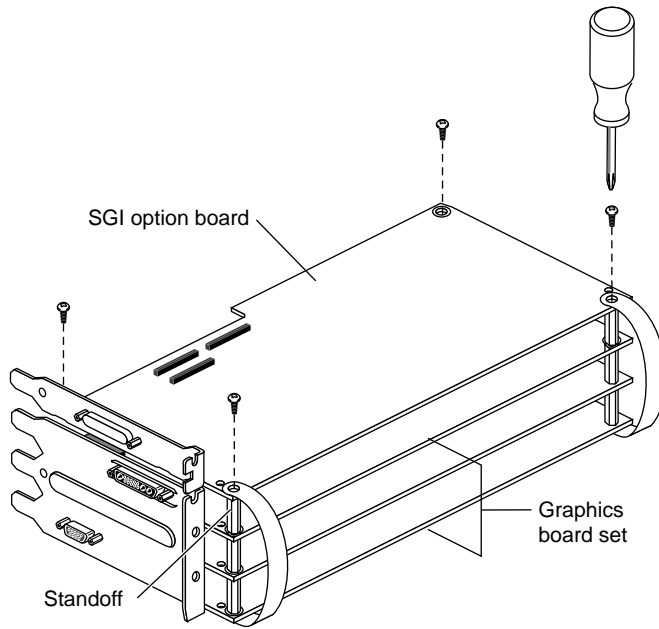
Figure 5-19   Removing Standoff Screws

Note: Do not remove standoff screws unless they are corner standoff screws. Some daughter boards connect with standoffs located in other positions on the board. Do not remove daughter board standoffs. The daughter board will be removed as a unit with its parent board.

■ Disconnect the pull straps from the top of the board by peeling the adhesive-backed strap from the board. See Figure 5-20.
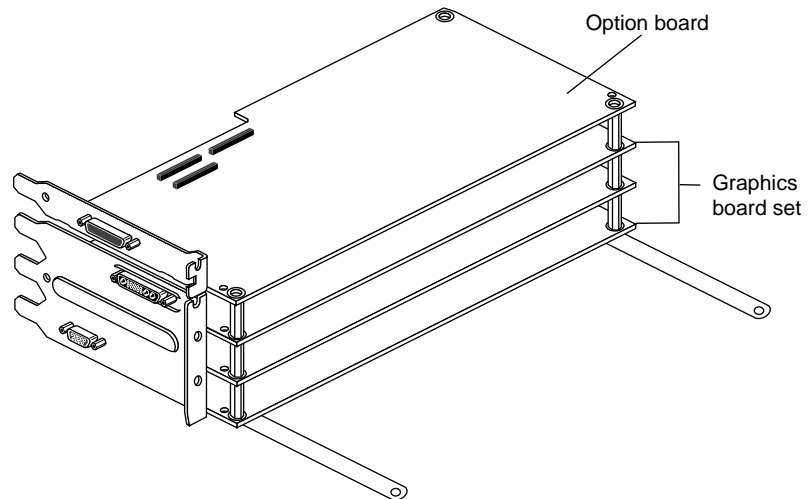
Figure 5-20   Disconnecting the Pull Straps

4. If you have flex cables connected to the option board, go to step 7.

5. Remove the board and put it on an antistatic surface.

6. If you have no flex connectors on the next board, go to step 11.

7. Disconnect any flex cables from the top of the board.

   ■   Press down on the levers to release the connector. See Figure 5-21.

   ■   Grasp the sides of the connector and pull up. See Figure 5-22.

Push levers down
to release connector

Cable connector
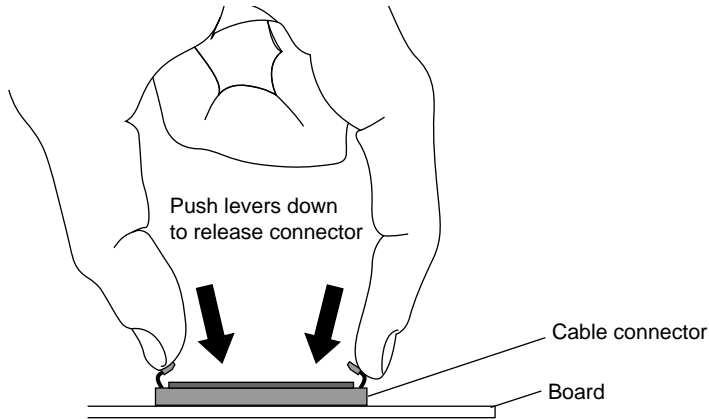
Board

Figure 5-21   Releasing Flex Connectors

Flex cables,
disconnect here

High IMPACT
graphics
board set

Top (A) Board

Bottom Board
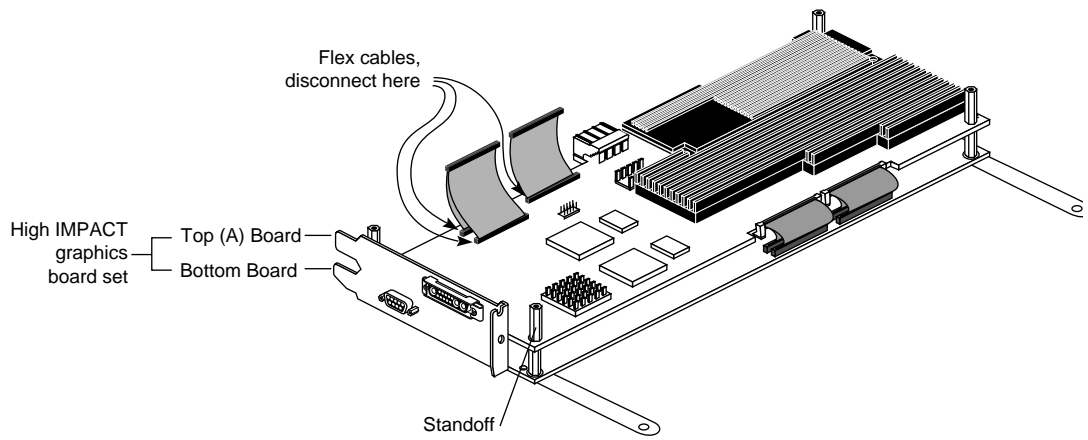
Standoff

Figure 5-22   Removing Flex Cable From Connectors

8. If you have no standoffs to remove, go to step 10.

9. Remove the corner standoffs. Use the wrench if necessary.

10. Remove the board and place it on an antistatic surface.

11. To complete your task, go to the appropriate section in the installation manual that comes with your board or to the appropriate sections of this manual to do one of the following:

   ■ To install a texture memory option board on the top board of your High or Maximum IMPACT graphics board set, turn to page 131.

   ■ To install a texture memory option board on the middle board of your Maximum IMPACT graphics board set, turn to page 137.

   ■ To upgrade your graphics boards, turn to "Upgrading Graphics Boards" on page 128.

   ■ To reinstall the option boards, turn to "Installing Cables and Standoffs to the Option Boards" on page 147.

   ■ To install your Solid IMPACT graphics board, turn to page 163.

   ■ To install your High IMPACT graphics board set, turn to page 163

   ■ To install your Maximum IMPACT graphics board set, turn to page 166.

   ■ Should you need additional help placing your graphics board set with option boards in the proper slots, see Table 4-1 or Table 4-2 on page 87, or Table 4-3 on page 88.

'

Upgrading Graphics Boards

To upgrade from a Solid IMPACT to a High IMPACT or Maximum IMPACT graphics board or from a High IMPACT to a Maximum IMPACT graphics board set, go to "Shutting Down the System" on page 106. You will need to shut down the system, remove the cover, remove the installed graphics board set and any attached graphics boards.

2. If you have option boards to install to your new upgrade board set, remove the flex cables that connect your graphics board or board set to an option board above. See Figure 5-23.
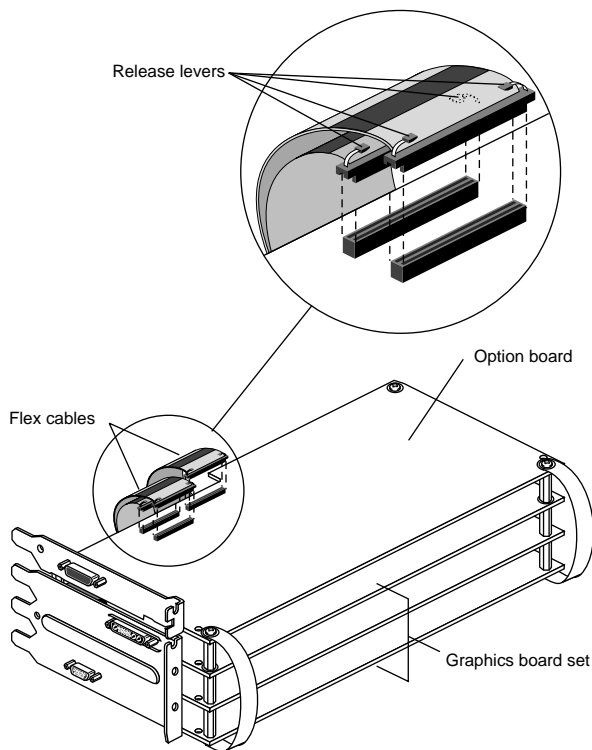
Figure 5-23   Identifying Flex Cables That Connect to an Option Board

Note: The process will be the same for all graphics boards. The High IMPACT graphics board set is shown in the upgrade illustrations.

3. Disconnect any flex cables from the top board.

    ■   Press down on the levers to release the connector. Then grasp the sides of the connector and pull up. See Figure 5-24.
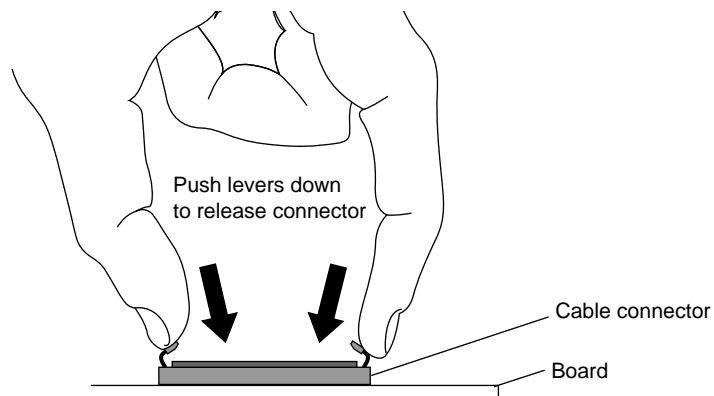
Figure 5-24   Removing the Option Board Flex Cables From the IMPACT Graphics Board

4. Install the flex cables into the same connectors on the top of the upgrade board set.

5. Slip the innermost cable through the levers of the outermost connector. See Figure 5-25.

Release
levers
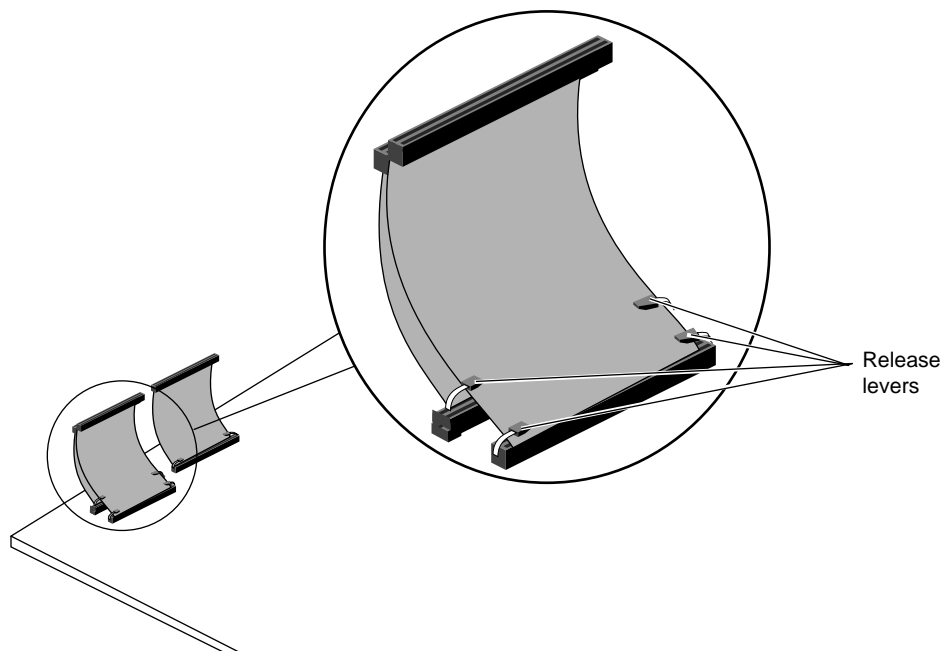
Figure 5-25   Installing the Flex Cables on the Upgrade IMPACT Graphics Board Set

6. Go to page 147 for instructions on installing the option boards on your new upgrade board set.

Removing and Replacing the Texture Memory Option Board

To remove or replace the texture memory option board, follow these instructions:

If you have not already shut down the system, removed the cover, attached the wrist strap, removed any option boards, and removed the graphics board set, go to "Shutting Down the System" on page 106 for instructions. Follow the instructions through removing the graphics board set. Then return to this page.

The EISA or GIO board is extremely sensitive to static electricity; you must wear the wrist strap while installing it. The wrist strap prevents the flow of static electricity, which could damage the board.

The graphics board set must be removed before you can remove or replace the texture memory option board.

Removing, Replacing, or Installing the Texture Memory Option Board on the Top Board of the Graphics Board Set

Removing or replacing the texture memory option board on the top board of the High IMPACT or Maximum IMPACT graphics board set is the same procedure for both board sets.

Note: Texture memory boards on the top and middle boards of the Maximum IMPACT board set must both be removed if you are not replacing them. The board set will not operate properly with only one texture memory option board.

To remove a texture memory option board from the top board, go to step 1, below.

To install or replace a texture memory option board, go to step 3.

1. Determine the location of the texture memory board. The texture memory board sits on the top board of the graphics board set in the right rear corner. See Figure 5-26.
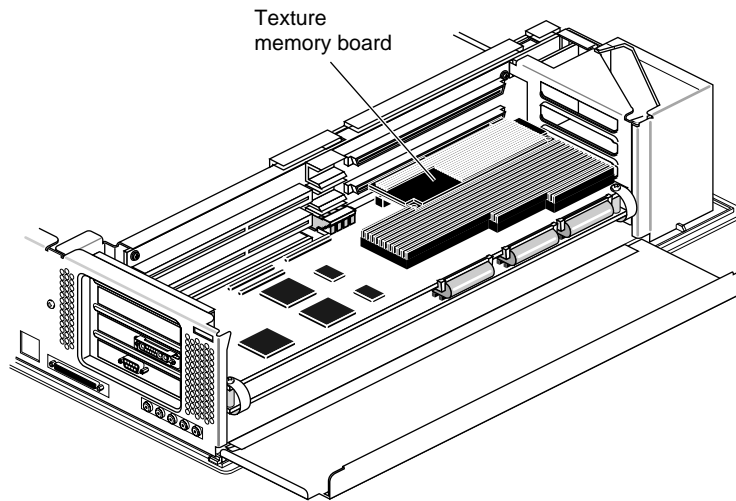
Figure 5-26   Determining the Location of the Texture Memory Option Board

2. Remove the texture memory option board from the top of the graphics board set. See Figure 5-27.

    ■   Grasp the pins and pull up to remove. The pins fit tightly into their sockets.

    ■   Slide your fingers under the edge of the texture memory board that faces the interior of the workstation.

    ■   Slide your fingers under the edge of the texture memory board push up until the board is disconnected from the graphics board. See Figure 5-27.
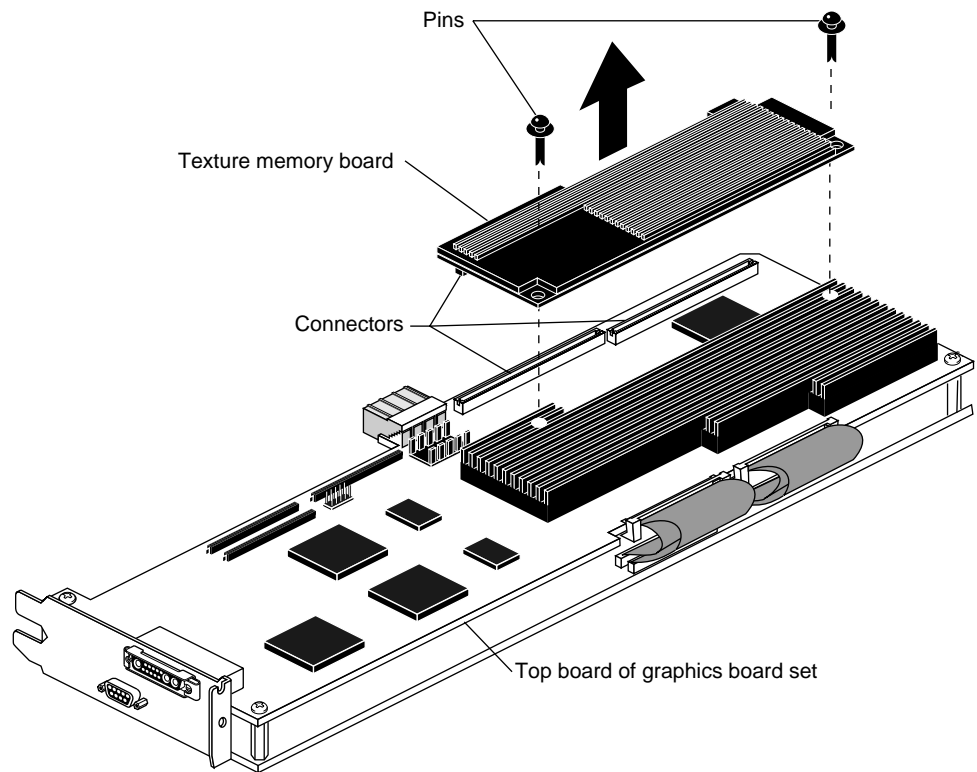
Figure 5-27   Removing the Texture Memory Board

3. To replace the texture memory option board, place it on the top graphics board.

    ■   Align the connectors on the underside of the texture memory board with the connectors on the top graphics board. See Figure 5-28.
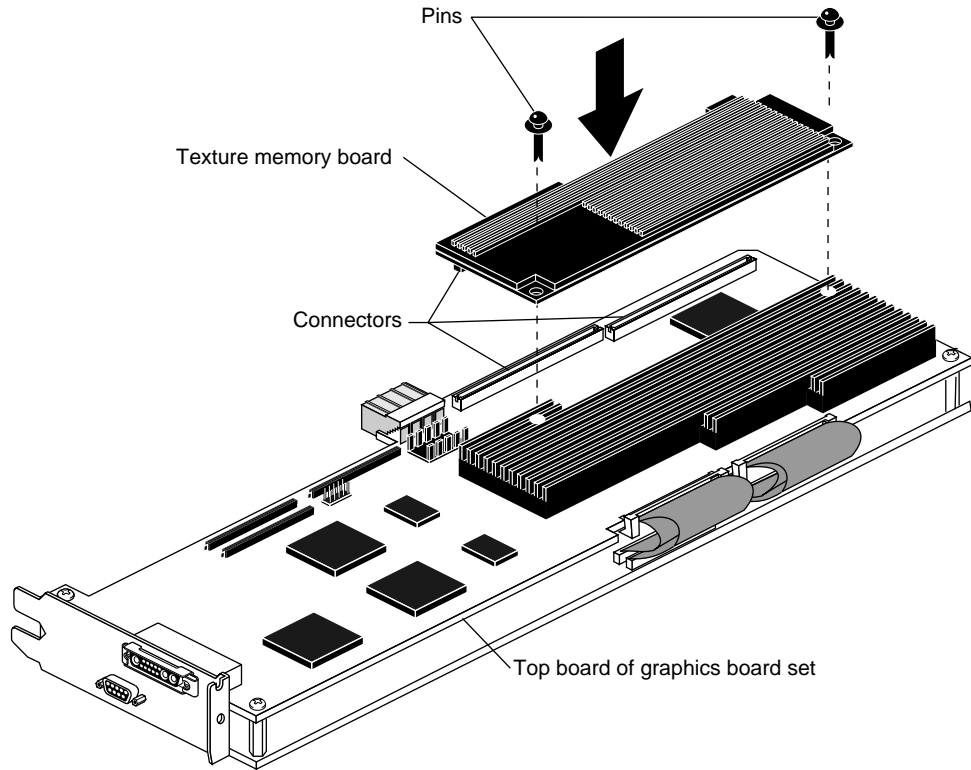
Figure 5-28   Installing the Texture Memory Board

4. Seat the texture memory board.

   ■ Place your fingers under the top graphics board and your thumb on top of the texture memory board. See Figure 5-29.

   ■ Pinch the texture memory board into the connectors, running your thumb along the edge of the texture memory board as you press the boards together.

   ■ Check visually to see that the connectors are fully seated along their full length.
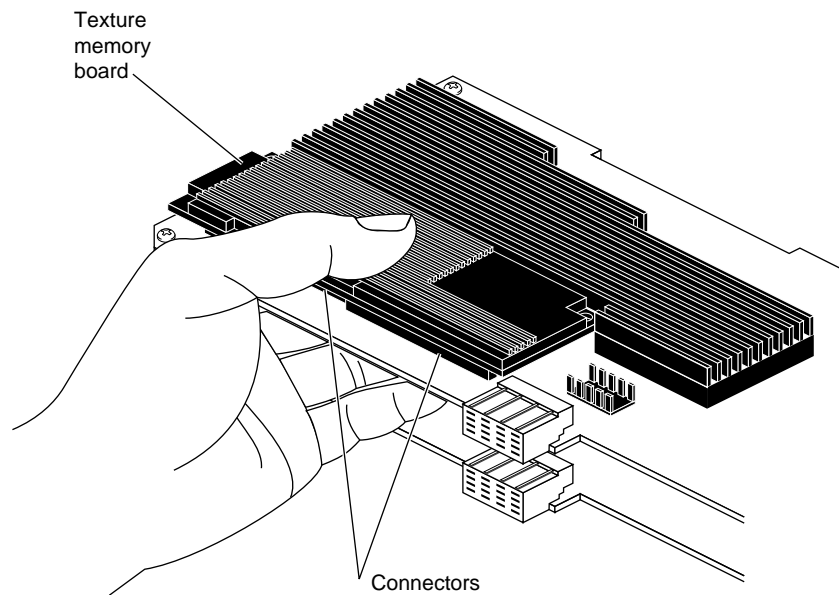
Figure 5-29   Seating the Texture Memory Board

5. Use the push pins to connect the other ends of the texture memory board to the top graphics board.

   ■ Place each pin in a hole at the edge of the board. See Figure 5-30.

   ■ Push the pins into place. The pins snap into place when properly seated.
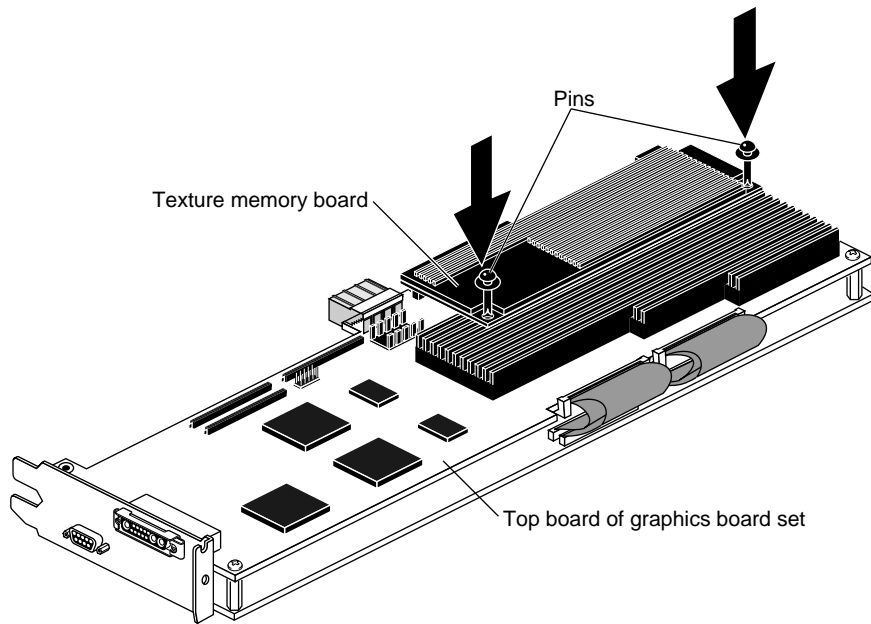
Figure 5-30   Seating the Push Pins

You are now ready to replace your High IMPACT graphics board set.

• See page 147 for instructions on installing cables and standoffs to option boards.

• See page 163 for instructions on replacing your High IMPACT graphics board set.

To remove, install, or replace your texture memory option board on the middle board of the Maximum IMPACT graphics board set, go to "Removing or Replacing the Texture Memory Option Board on the Middle Board of the Maximum IMPACT Board Set."

Removing or Replacing the Texture Memory Option Board on the Middle Board of the Maximum IMPACT Board Set

Note: Texture memory boards on the top and middle boards of the Maximum IMPACT board set must both be removed if you are not replacing them. The board cannot not operate properly with only one texture memory option board.

To remove or replace the texture memory option board on the middle board of the Maximum IMPACT board set, follow these steps:

1. Turn the board set so the long board edge with the pull straps is facing away from you.

2. Use a Phillips screwdriver to remove the screws from the standoffs, as shown in Figure 5-31.

    Note: If the standoffs spin as you unscrew the screws, use the wrench that comes with your texture memory option board to hold the standoffs steady.
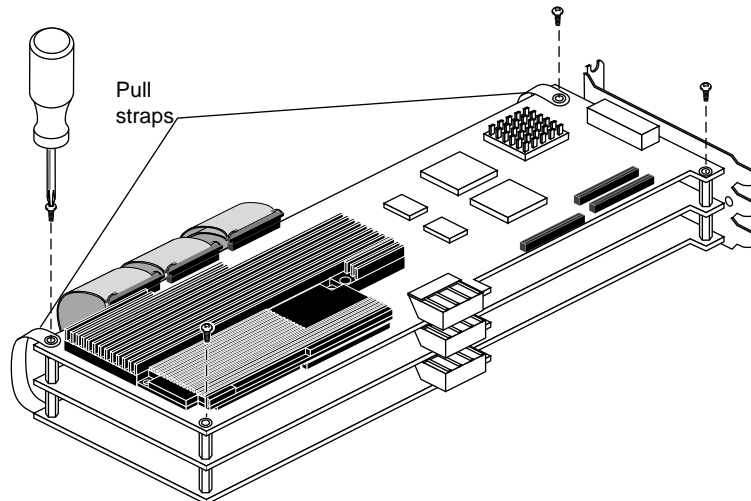
Figure 5-31   Removing the Screws From the Standoffs

3. Remove the pull straps from the top board. They are attached with adhesive.

   ■ Pull sideways and upward to remove the pull straps from the top board.

   ■ Do not detach the pull straps from the bottom of the board set.

4. Remove the I/O panel from the side of the board set.

   ■ Use the I/O wrench to remove the screws from the I/O panel. See Figure 5-32.
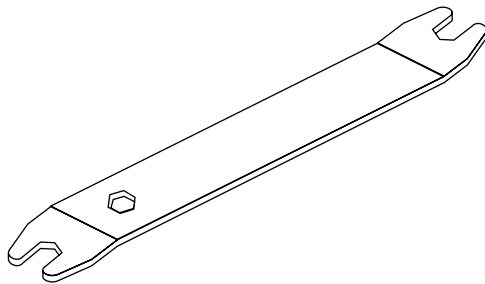
Figure 5-32   I/O Wrench

   ■ Slide the I/O panel off the connectors. See Figure 5-33.

I/O Panel

Graphics
board set
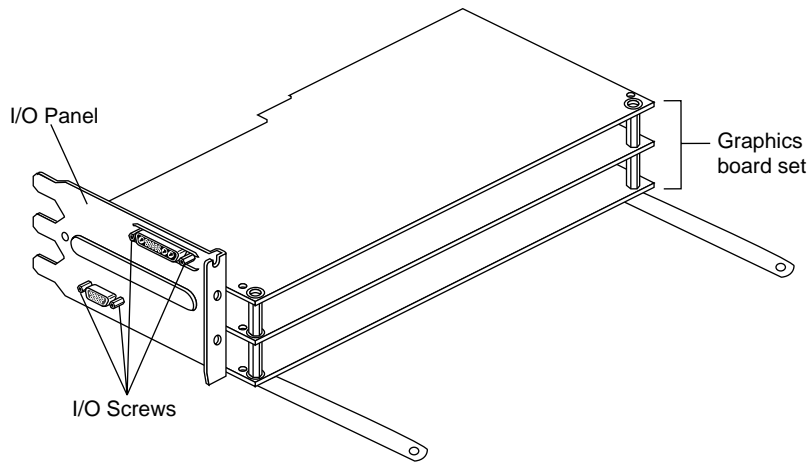
I/O Screws

Figure 5-33   Removing I/O Panel Screws

5. Grasp the top board on the back edge, opposite the side with pull straps, and gently rotate until the edge of the top board rests on the antistatic surface. See Figure 5-34.
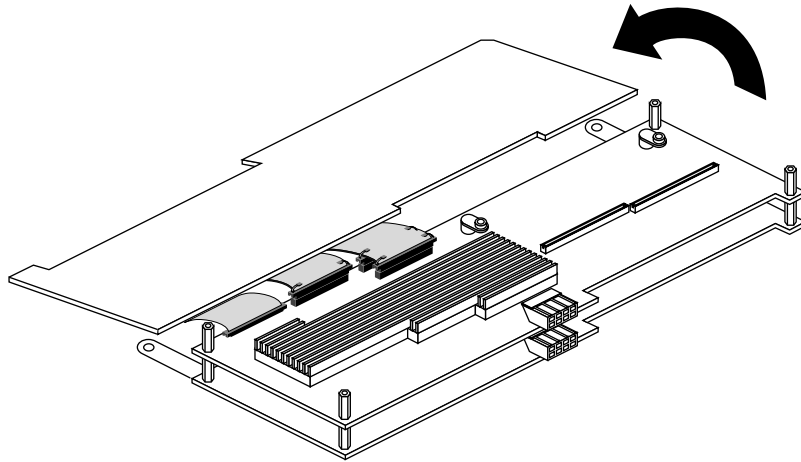
Figure 5-34   Rotating the Top Board to an Open Position

To remove a texture memory option board from the middle board, see the next step. To install a texture memory option board on the middle board, go to step 8.

6. Determine the location of the texture memory option board. See Figure 5-35.
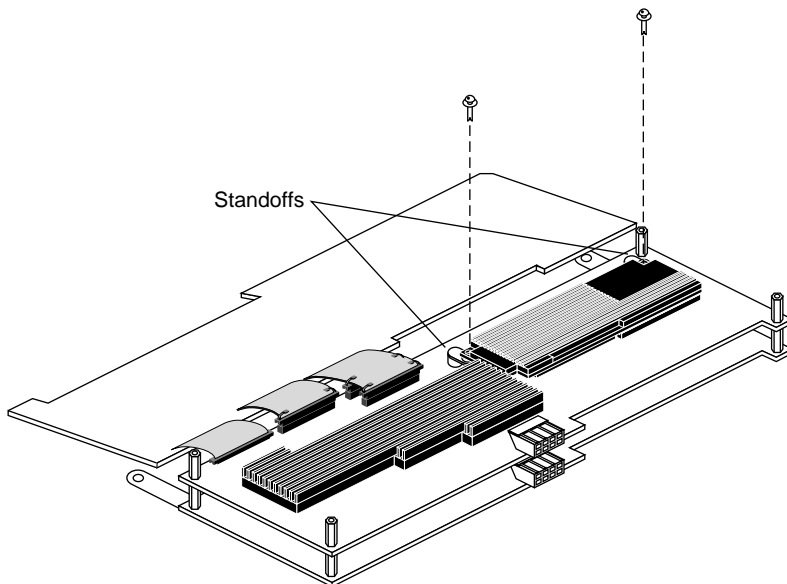
Figure 5-35   Location of Texture Memory Board on Middle Board

7. Remove the push pins by pulling up. See Figure 5-35.

    ■   Grasp the pins and pull up to remove them. The pins fit tightly into their sockets and may be hard to pull out.

    ■   Slide your fingers under the long edge of the texture memory board that faces the midplane.

8. Slide your fingers under the edge of the board and push up until the board is disconnected from the graphics board. See Figure 5-36.

Standoffs
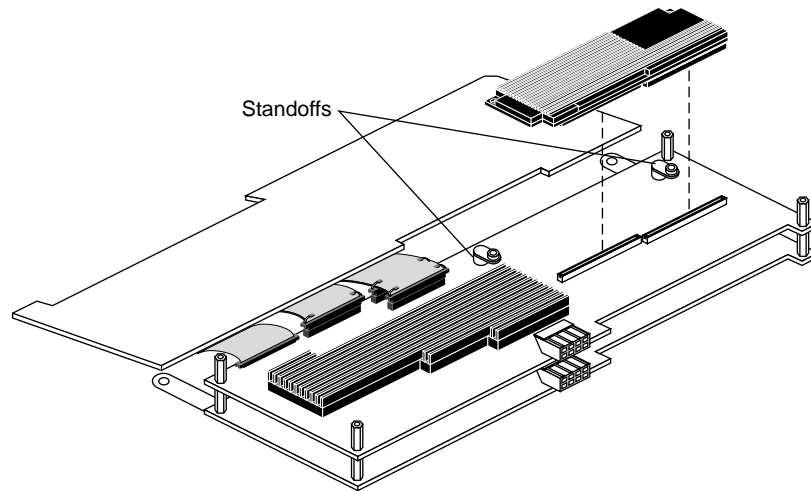
Figure 5-36   Disconnecting the Texture Memory Board From the Middle Board

9. To replace the texture memory option board, place it on the middle graphics board.

10. Align the connectors on the underside of the texture memory board with the connectors on the middle graphics board, and the standoffs with the holes along the edge of the texture memory option board. See Figure 5-37.

Standoffs
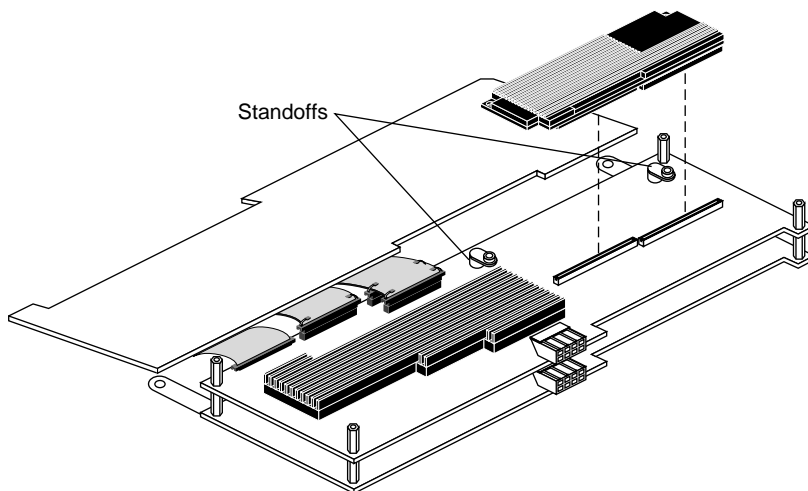
Figure 5-37   Aligning the Texture Memory Board on the Middle Board

Note: If the texture memory option board is installed backward, the system will not work.

11. Seat the texture memory board.

■ Place your fingers under the middle graphics board and your thumb on top of the texture memory board. See Figure 5-38.
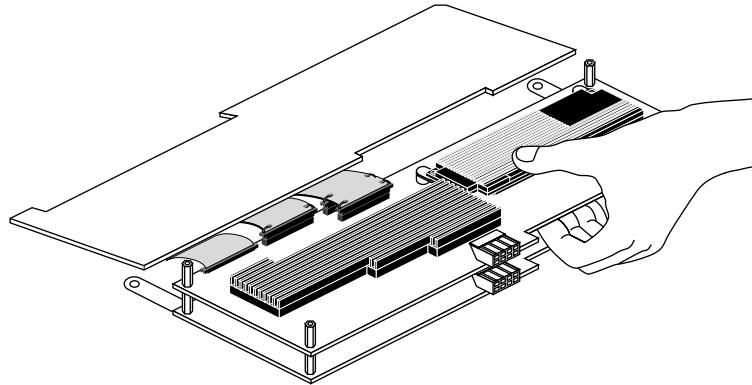
Figure 5-38   Seating the Texture Memory Option Board

■ Pinch the texture memory board into the connectors, running your thumb along the edge of the texture memory board as you press the boards together.

■ Check visually to see that the connectors are fully seated along their full length. See Figure 5-39.
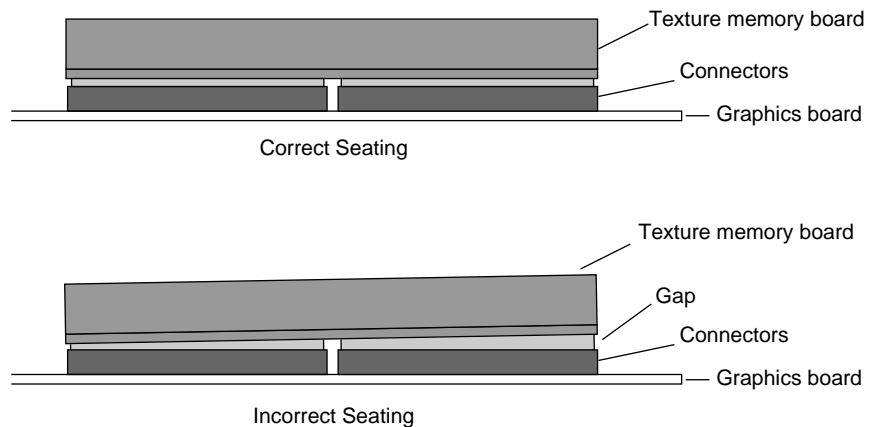
Figure 5-39   Correctly Seating the Texture Memory Option Board

12. Use the push pins to attach the texture memory board to the standoffs on the middle graphics board. See Figure 5-40.

    Note: If the push pins do not snap into standoffs beneath the edge of the texture memory board, check to make sure you have not placed the board in backwards. See Figure 5-40.

    ■ Place each pin in a hole at the edge of the texture memory board.

    ■ Push the pin into place. The pins snap into place when properly seated.
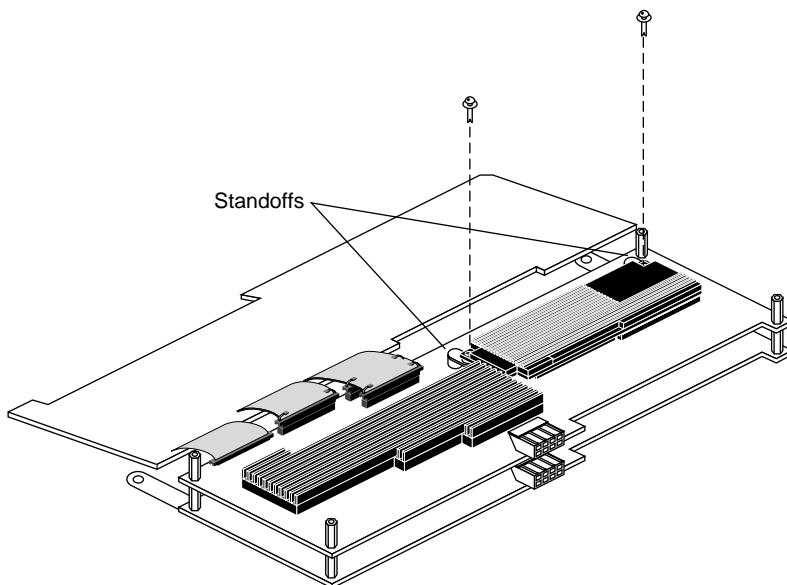
Figure 5-40   Seating Push Pins

13. Rotate the top board set into place above the middle board.
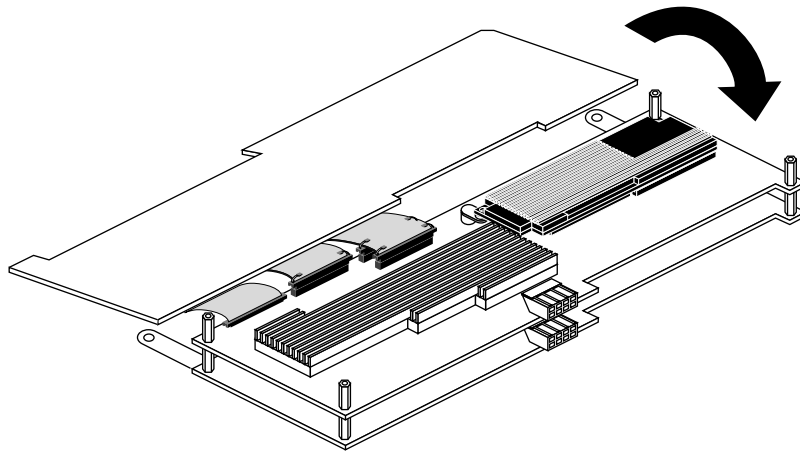
Figure 5-41   Reconnecting the Top Board

14. Reconnect the pull straps to the top board.

   ■   Align the pull strap holes over the screw holes to the standoffs.

   ■   Press on the end of the pull strap, causing the strap to adhere to the board.

15. Replace the screws in the standoffs. See Figure 5-42.
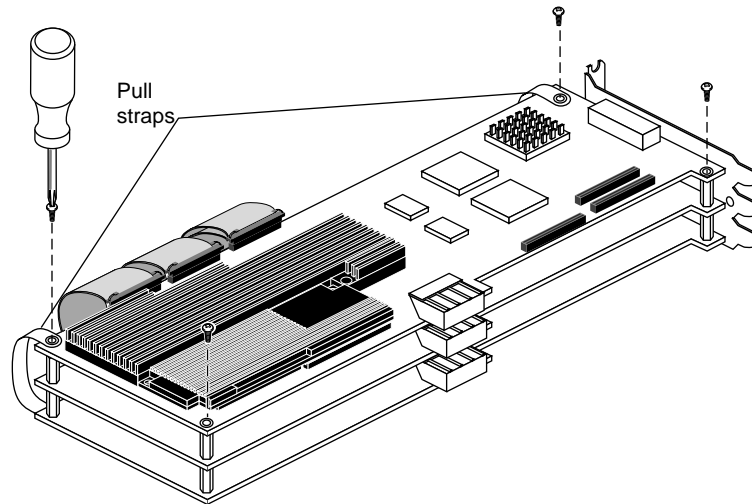
Figure 5-42 Replacing the Screws

16. Replace the I/O panel.

■ Slide the panel over the connectors.

■ Replace the I/O screws, using the I/O wrench.

You are now ready to replace the Maximum IMPACT board set in the chassis.

• To install the option board cables and standoffs, go to "Installing Cables and Standoffs to the Option Boards" on page 147.

• To replace the Maximum IMPACT board set, see step 3 on page 166.

Installing Cables and Standoffs to the Option Boards

To reconnect cables and standoffs, follow these instructions:

1. Place the board on the standoffs attached to the board below. If the standoffs were removed, replace them.

2. Insert the standoffs through the holes in the corner of the board to the standoffs below. Tighten the standoff to the one below.

3. Reconnect the cable after you have attached the board to the standoffs.

    ■   Press the connectors together with your fingers. Try to support the board from beneath with your fingers, so the connectors seat tightly. If possible, check visually to be sure the connectors are properly seated.
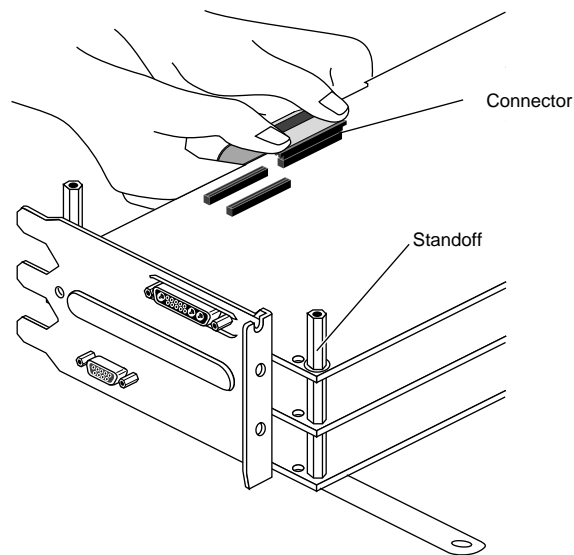
Figure 5-43   Seating the Connectors

4. Insert the cable of the innermost cable beneath the release levers of the outermost flex cable connector before it is reconnected. See Figure 5-44.
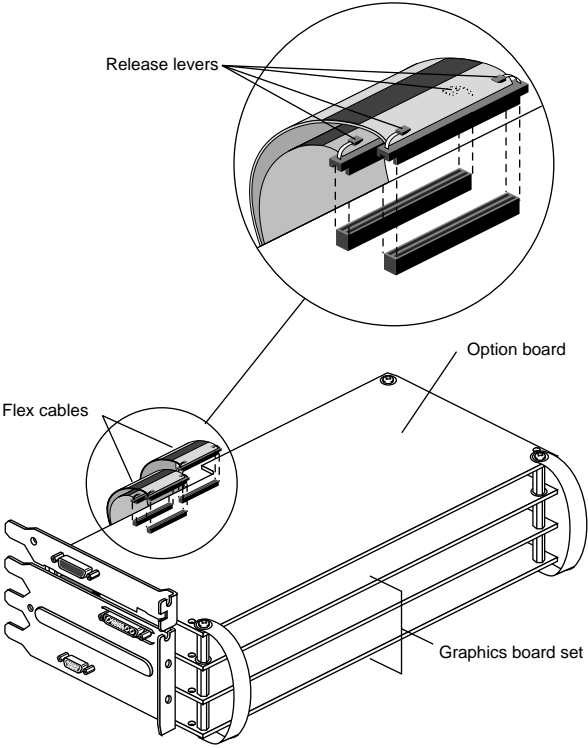
Figure 5-44   Reattaching the Flex Connectors

5. Continue attaching boards, standoffs, and cables, until you reach the top level.

6. At the top board level, reattach the pull straps to the top board.

    ■   Align the holes in the pull straps with the holes in the board.

    ■   Press down on the top of the pull strap to reattach the adhesive on the back of the strap to the board.

7. Insert the screws through the pull strap and corner holes of the board and into the standoffs. Tighten using a Phillips screwdriver.

8. Go to step 1, page 150 for instructions on replacing the Solid IMPACT graphics board.

9. Go to step 2, page 151 for instructions on replacing the High IMPACT graphics board set.

10. Go to step 4, page 153 for instructions on replacing the Maximum IMPACT board set.

    Should you need help replacing your graphics board set in the proper slots, see Table 4-2 on page 88 or Table 4-3 on page 88.

Replacing the Graphics Boards

1. Replace the Solid IMPACT board in the chassis. (For High IMPACT board set replacement, see step 2, page 151. For Maximum Board Set replacement, see step 4, page 153.)

   ■ Insert the board carefully so that the board edge does not catch on the EMI lining along the inner left cutout area. Make sure the EMI lining is not damaged and remains between the chassis and the graphics board's metal extension.

   ■ Grasp the chassis with your fingers and push the board set into place with your thumbs. See Figure 5-45.

   ■ Push the board set into the slot until the connector on the back of the board is securely connected to the connector on the midplane.
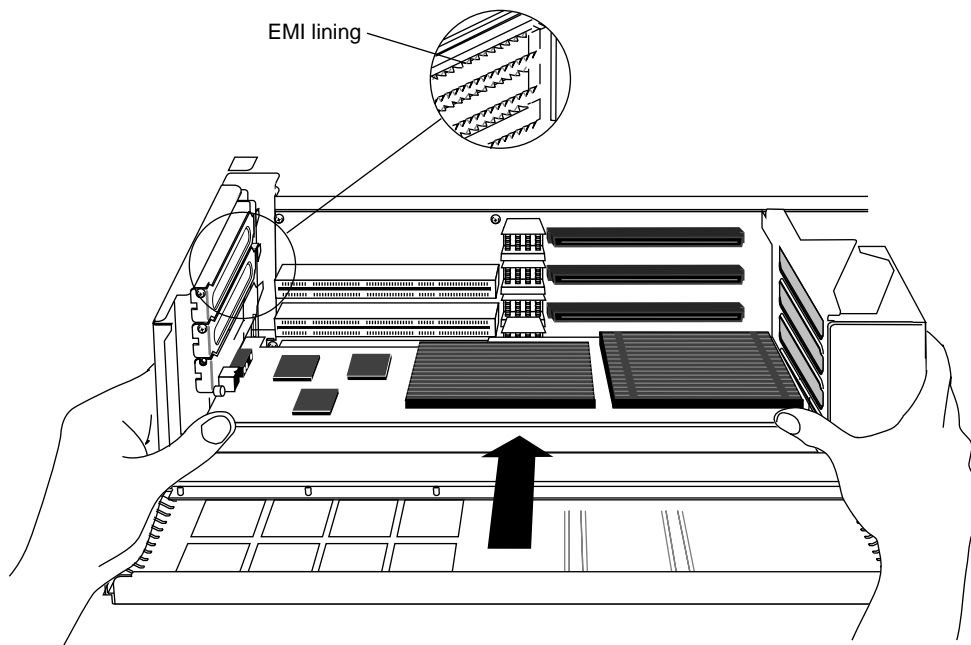
Figure 5-45   Replacing the Solid IMPACT Graphics Board

2. Replace the High IMPACT Board Set in the chassis.

   ■ Insert the board carefully so that the board edge does not catch on the EMI lining along the inner left cutout area. Make sure the EMI lining is not damaged and remains between the chassis and the graphics board's metal extension.

   ■ Grasp the chassis with your fingers and push the board set into place with your thumbs. See Figure 5-46

   ■ Push the board set into the slot until the connector on the back of the board is securely connected to the connector on the midplane.

   Note: You must use some force to seat the connectors.
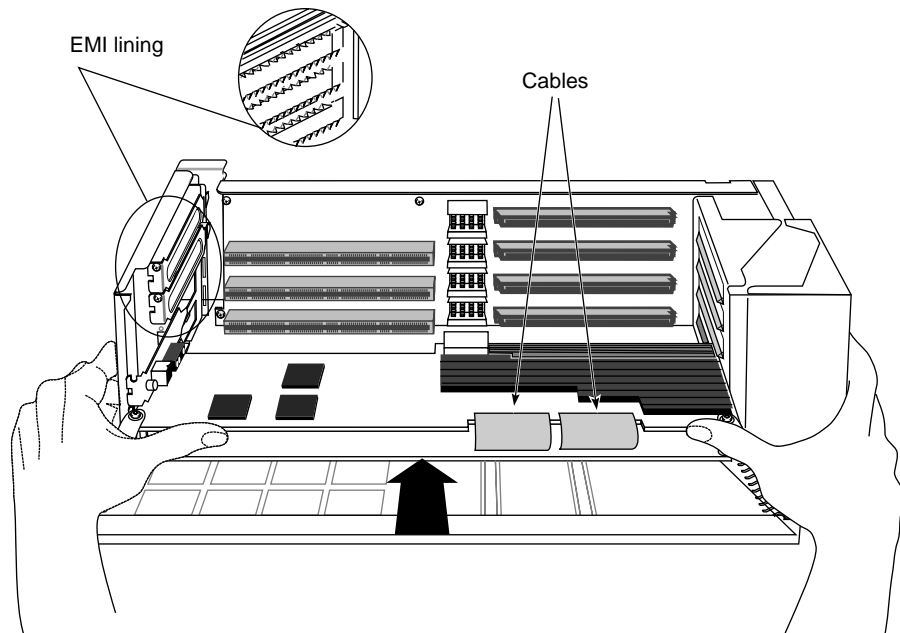
Figure 5-46   Replacing the High IMPACT Graphics Board Set

Tip: Place pressure on the recommended board edge or standoff near the top of any board stack when reinserting the board stack into the workstation. You must use some force to seat the board stack properly.

Caution: As you replace the board set, do not press on the flexible cables that vertically connect your Indigo^2 High IMPACT boards.

3. Visually check to be sure the boards are completely seated in their connectors. The board set should not look tilted when viewed from above. See Figure 5-47.
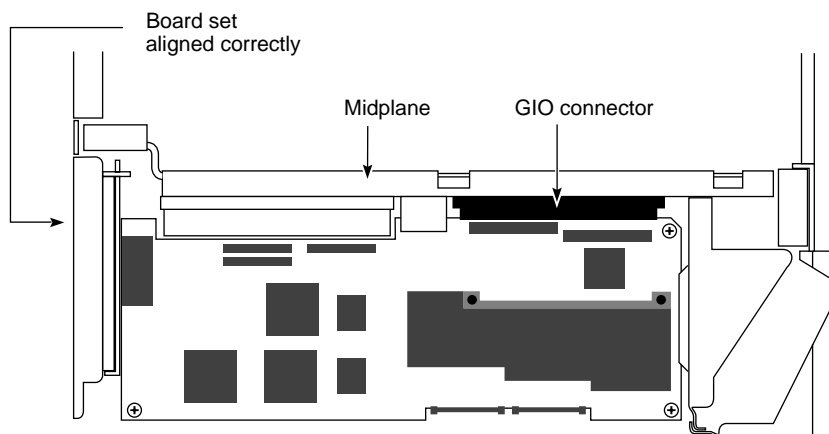
Figure 5-47   Board Set that Is Correctly Aligned, Viewed From Above

Go to step 6, page 155.

4.   Replace the Maximum IMPACT Board Set in the chassis.

■   Grasp the chassis with your fingers and push the board set into place with your thumbs.

■   Place your right thumbs behind the pull straps, and push against the right standoff. Place your left thumb behind the pull strap and press against the middle board as shown in Figure 5-48.

■   Push the board set into the slot until the connector on the back of the board is securely connected to the connector on the midplane.

Note: You must use some force to securely seat both connectors to the midplane. You may hear one popping sound and one set of connectors is seated. Press again to be sure the second set of connectors is also seated.

Caution: As you replace the board set, do not press on the flexible cables that vertically connect your Indigo^2 Maximum IMPACT boards to avoid damaging the cables.
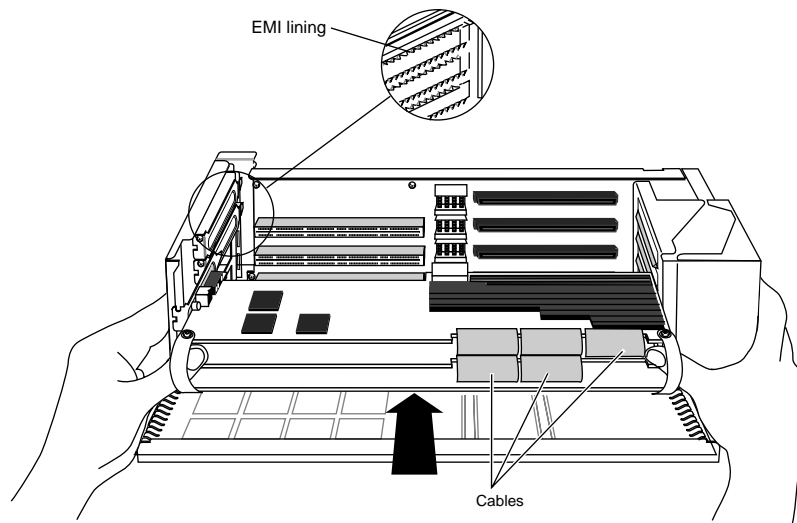
Figure 5-48   Replacing the Maximum IMPACT Graphics Board Set

Tip: Place pressure on the recommended board edge or standoff near the top of any board stack when reinserting the board stack into the workstation. You must use some force to seat the board stack properly.

5. Visually check to be sure the boards are completely seated in their connectors. The board set should not look tilted when viewed from above. See Figure 5-49.
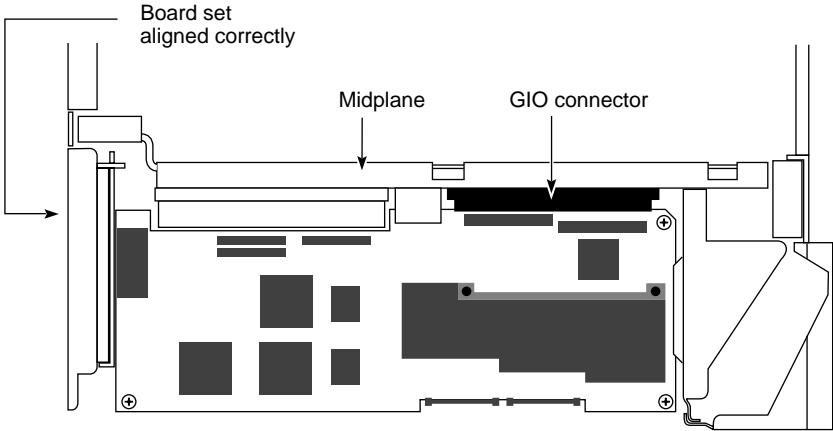
Figure 5-49 Board Set, Correctly Aligned, Viewed From Above

6. Insert and tighten the screws that hold the board set to the chassis. The screw openings are located on the metal extension on the left side of each board. The number of screws to insert will equal the numbers of boards in the set. See Figure 5-50.
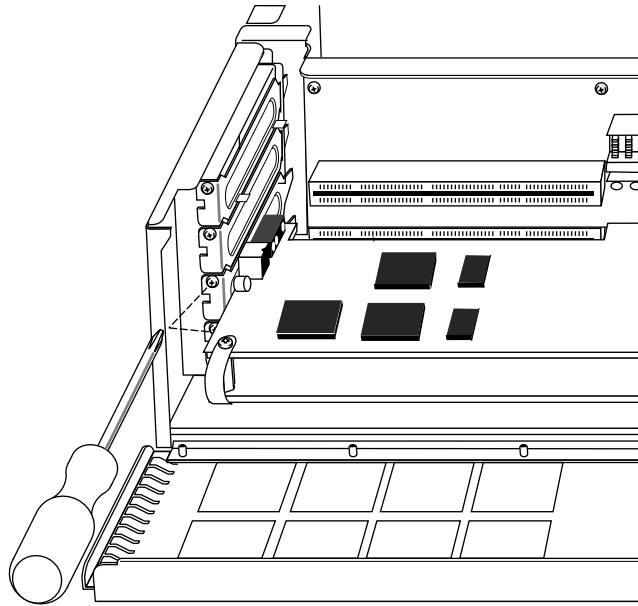
Figure 5-50   Replacing the Screws for the High IMPACT Board Set

Note: The Solid IMPACT board requires one screw and the Maximum IMPACT board set requires three screws.

7. Hang the retention pin so that it sits in front of the board set. The retention pin prevents the board set from moving away from the connectors. See Figure 5-51.

    Tip: Use the retention pin as a plumb line to determine if the board set is properly seated. If the pin is tilted, push on the board set until it is properly connected.
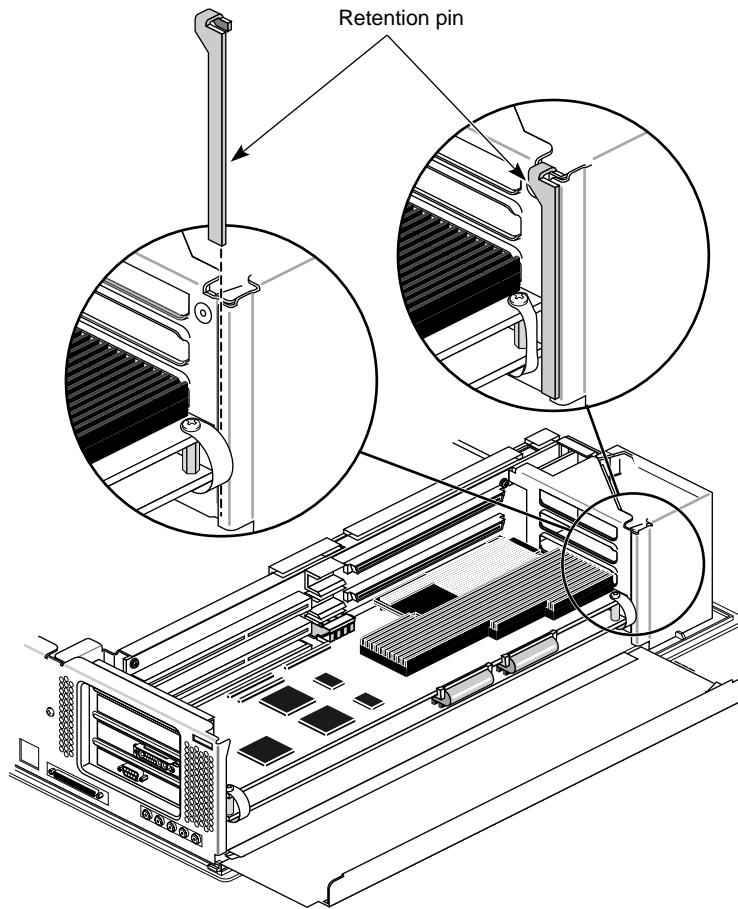
Figure 5-51   Replacing the Retention Pin

8. Tip the metal panel up in front of the boards until it snaps into place.
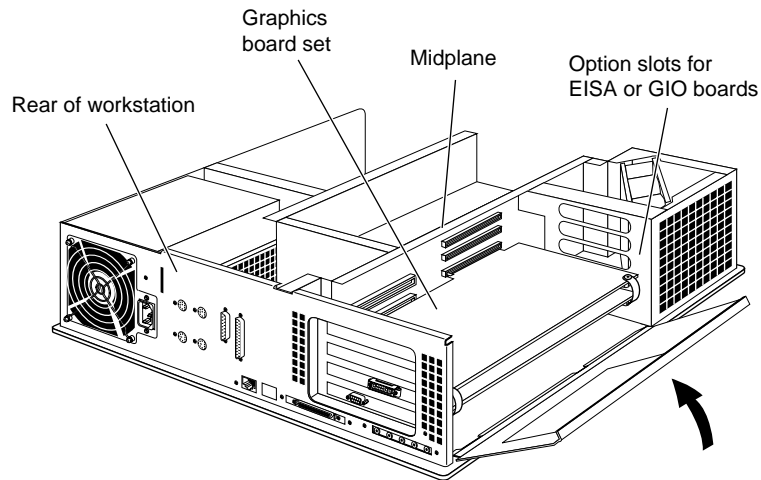
Figure 5-52   Closing the Metal Panel in Front of the Graphics Boards

9. Remove the antistatic wrist strap.

You are finished replacing the Indigo^2 Solid IMPACT graphics board or the Indigo^2 High IMPACT or Maximum IMPACT graphics board set.

If you need help placing your graphics board set and option boards in the correct slots, see Chapter 4, Table 4-2 or Table 4-3.

To replace the top cover, turn to "Replacing the Cover" on page 174.

Upgrading From an Indigo^2 IMPACT Ready System to an Indigo^2 IMPACT System

Upgrading your Indigo^2 IMPACT Ready system to an Indigo^2 IMPACT system requires replacing the board set and connecting power cables.

Go to "Shutting Down the System" on page 106 to shut down the system, remove the cover, and attach the wrist strap.

Make sure the wrist strap is attached to a metal part of the chassis.

Removing the Board Set

1. Move the workstation or position yourself so that you are facing the expansion slots, as shown in Figure 5-53.
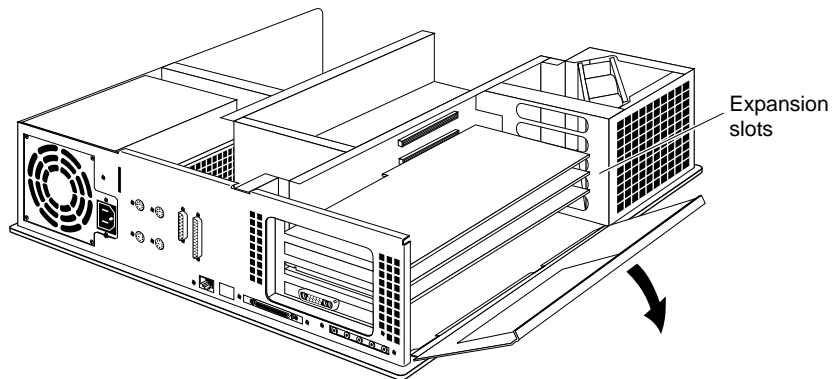
Expansion
slots

Figure 5-53   Opening the Metal Panel

2. Open the metal panel in front of the expansion slots by pulling up on the panel and lowering it.

   Note: If an option board is installed above your Indigo^2 Extreme, XZ, or XL graphics board set, you must remove it before proceeding. Follow the procedure for removing the option board as outlined in its installation manual.

   Indigo^2 video option boards will not work with Indigo^2 IMPACT graphics.

3. Remove the screws attaching the board set to the workstation slots, as shown in Figure 5-54.

    The screws are located on the metal extension on the left side of each board.

    ■   Loosen each screw with the Phillips screwdriver.

    ■   Unscrew and remove the screws with your hand.

    The screws are very small. If you drop a screw into the chassis, retrieve it to prevent shorting the system.
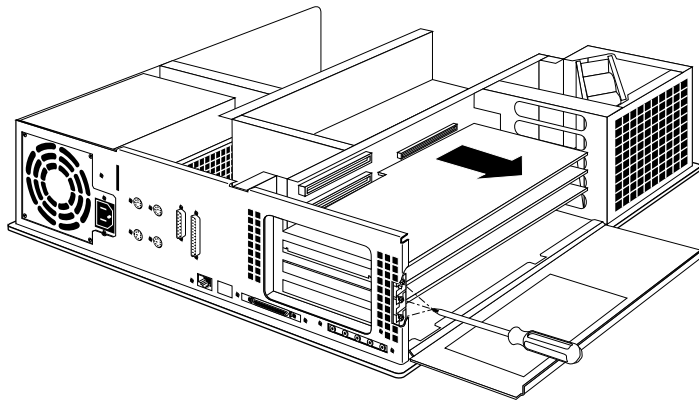
Figure 5-54   Removing the Screws Holding the Board Set

4. Remove the retention pin from the workstation.

    ■   Grasp the retention pin on the right-front end of the board set and pull it up and off. See Figure 5-55.

    Note: Check the placement of the retention pin. It hangs in front of the board, not beside it.
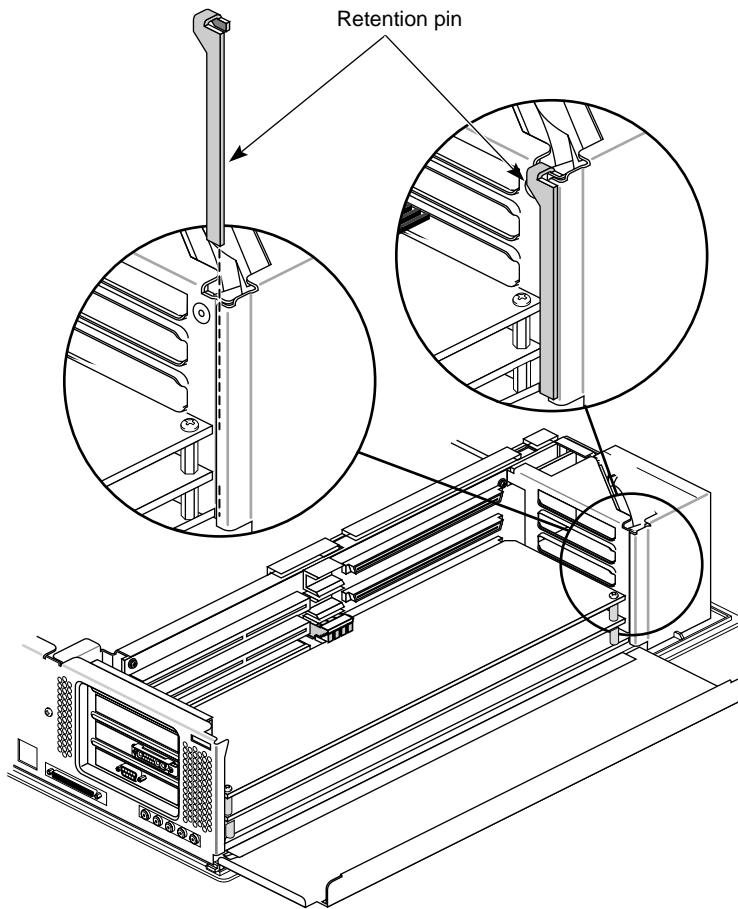
Retention pin

Figure 5-55   Removing the Retention Pin

5. Remove the XL graphics board from the workstation, using the two open-ended wrenches provided with the workstation.

    ■   Grasp the wrenches as shown in Figure 5-56. The orientation of the wrenches is important.
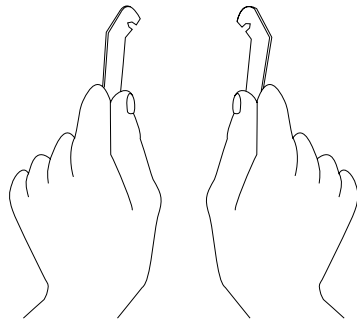
Figure 5-56   Orientation of Wrenches

    ■   Hook the ends of the wrenches in the small holes on each side of the front of the board, as shown in Figure 5-57.

    ■   Brace your index fingers against the chassis and pry the wrenches outward. The boards comes out.
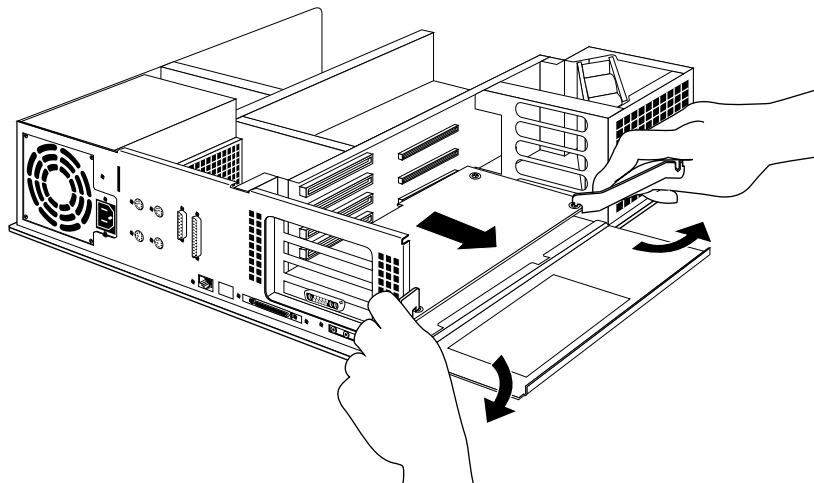
Figure 5-57   Removing the XL Graphics Board

■ Place the board on a flat, antistatic surface so the side with the chips faces up. An empty antistatic bag or a clean, dry desktop works well.

6. Pull the XZ or Extreme board set out of the workstation, as shown in Figure 5-58.

■ 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.

■ Place the board set down on a flat, antistatic surface so the side with the chips faces up. An empty antistatic bag or a clean, dry desktop works well.
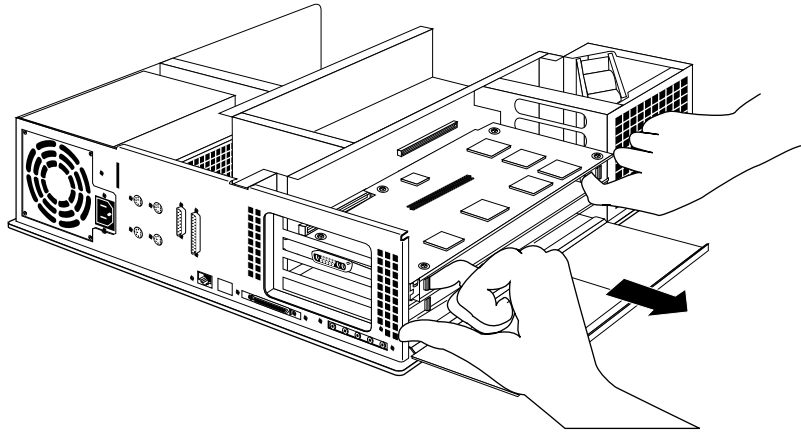
Figure 5-58   Removing the Board Set

Installing the Board Set

1. Install the Solid IMPACT or High IMPACT board set in the chassis. (For Maximum IMPACT board set placement, see step 4, page 153.)

   ■ Insert the board carefully so that the board edge does not catch on the EMI lining along the inner left cutout area. Make sure the EMI lining is not damaged and remains between the chassis and the graphics board's metal extension.

   ■ Grasp the chassis with your fingers and push the board set into place with your thumbs. See Figure 5-59.
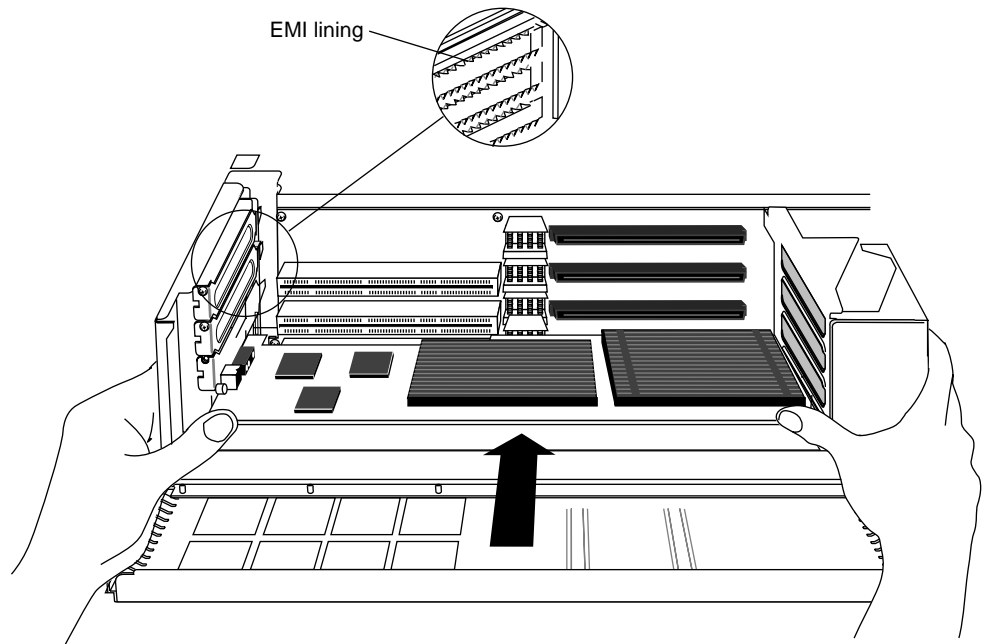
Figure 5-59   Inserting the Solid IMPACT Graphics Board

■ Push the board set into the slot until the connector on the back of the board is securely connected to the connector on the midplane. See Figure 5-60.

You must use some force to seat the connectors.
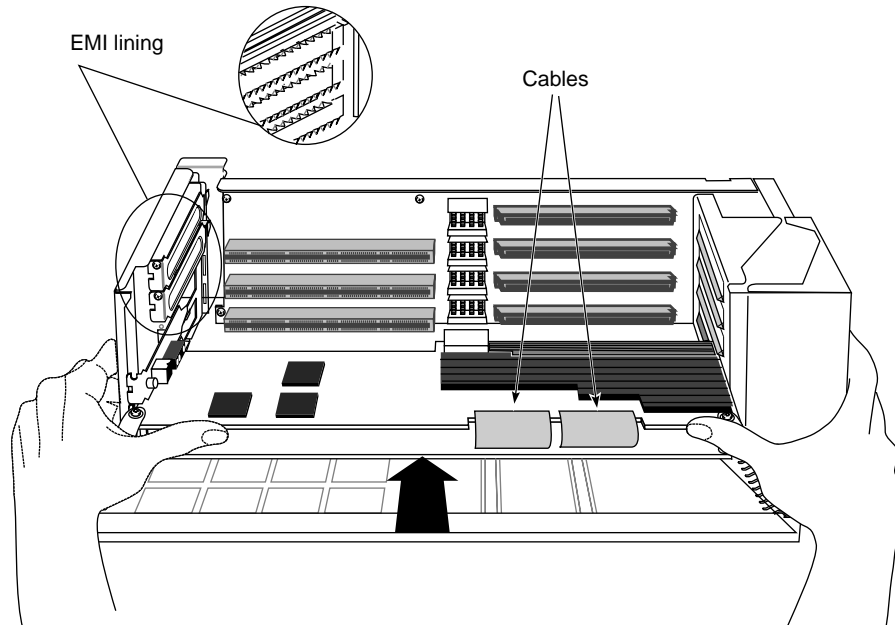
Figure 5-60   Connecting the High IMPACT Graphics Board Set to the Midplane

Tip: Place pressure on the recommended board edge or standoff near the top of any board stack when reinserting the board stack into the workstation. You will need to use some force to properly seat the board stack.

Caution: As you replace the board set, do not press on the flexible cables that vertically connect your Indigo[2] High IMPACT boards to avoid damage to the cables.

2. Visually check to be sure the boards are completely seated in their connectors. The board set should not look tilted when viewed from above. See Figure 5-61.
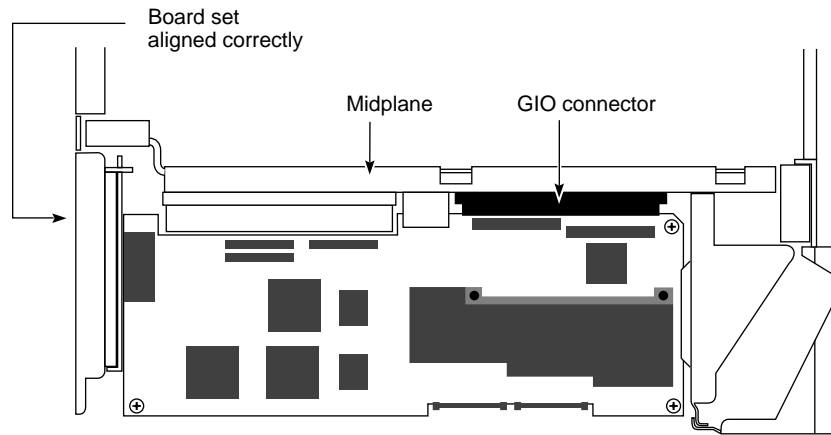
Figure 5-61   Board Set Correctly Aligned

Go to step 6, page 155.

3. Install the Maximum IMPACT Board Set in the chassis.

    ■   Grasp the chassis with your fingers and push the board set into place with your thumbs.

    ■   Place your right thumbs behind the pull straps, and push against the right standoff. Place your left thumb behind the pull strap and press against the middle board, as shown in Figure 5-62.

    ■   Push the board set into the slot until the connector on the back of the board is securely connected to the connector on the midplane.

    Note: You will need to use some force to securely seat both connectors to the midplane. You may hear one popping sound which indicates that one set of connectors is seated. Press again to be sure the second set of connectors is also seated.
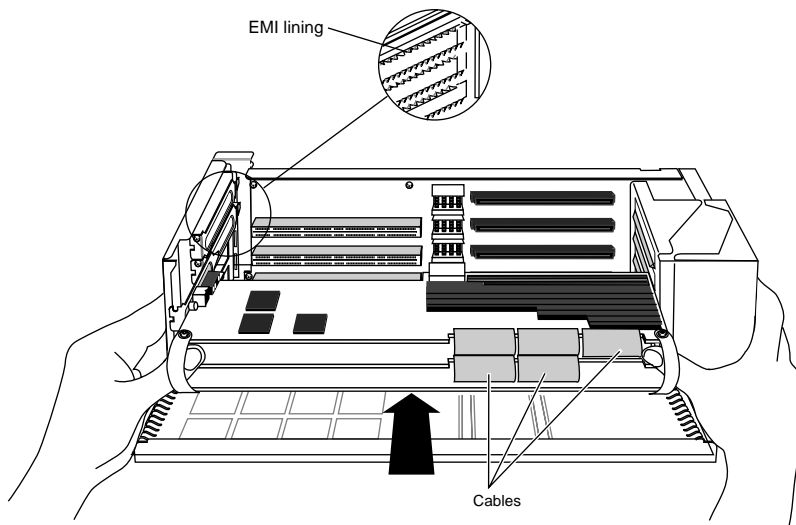
Figure 5-62   Reconnecting the Maximum IMPACT Graphics Board Set to the Midplane

    Caution: As you replace the board set, do not press on the flexible cables that vertically connect your Indigo^2 Maximum IMPACT boards.

    Tip: Place pressure on the recommended board edge or standoff near the top of any board stack when reinserting the board stack into the workstation. You will need to use some force to properly seat the board stack.

4. Visually check to be sure the boards are completely seated in their connectors. The board set should not look tilted when viewed from above. See Figure 5-63.
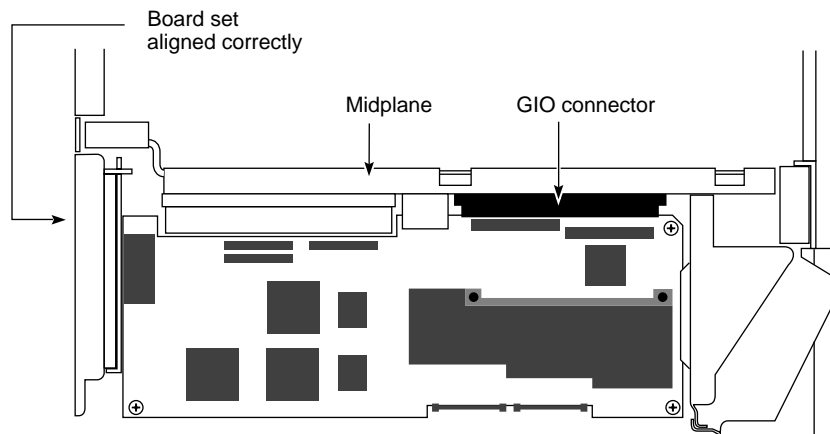
Figure 5-63   Correctly Aligned Board Set

5. Insert and tighten the screws that hold the board set to the chassis. The screw openings are located on the metal extension on the left side of each board. See Figure 5-64.
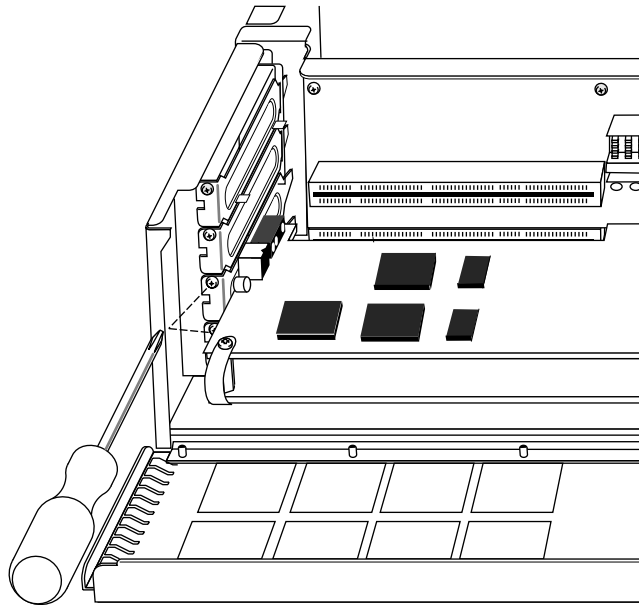
Figure 5-64   Inserting the Screws for the High IMPACT Board Set

Note: The Maximum IMPACT board set uses three screws.

6. Hang the retention pin so that it sits in front of the board set. The retention pin prevents the board set from moving away from the connectors. See Figure 5-65.

    Tip: Use the retention pin as a plumb line to determine if the board set is properly seated. If the pin is tilted, push on the board set until it is properly connected.
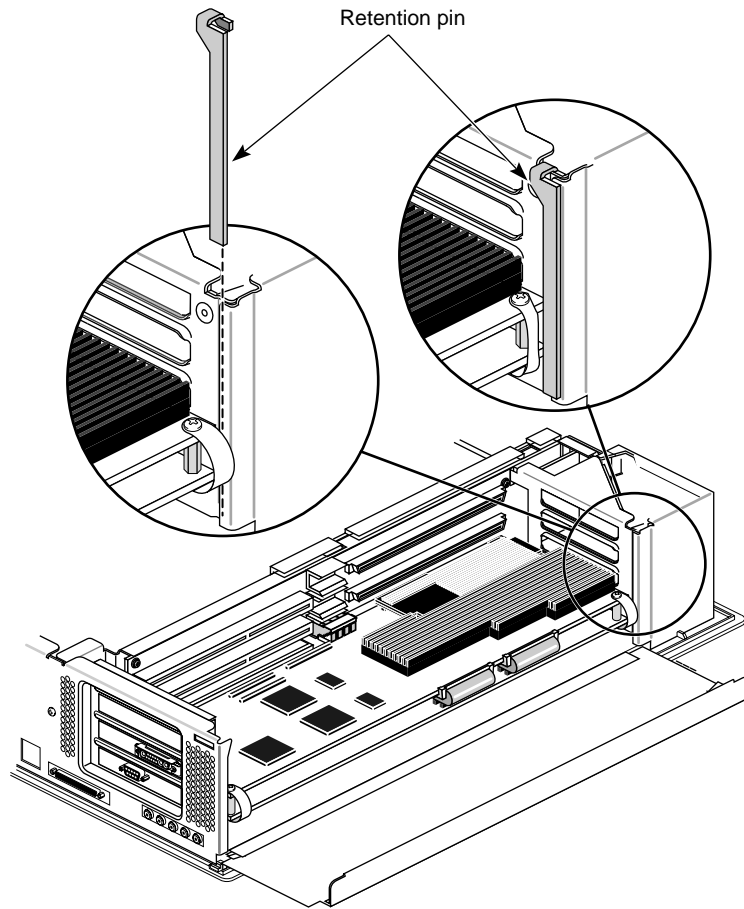
Retention pin

Figure 5-65 Hanging the Retention Pin

7. Tip the metal panel up in front of the boards until it snaps into place.
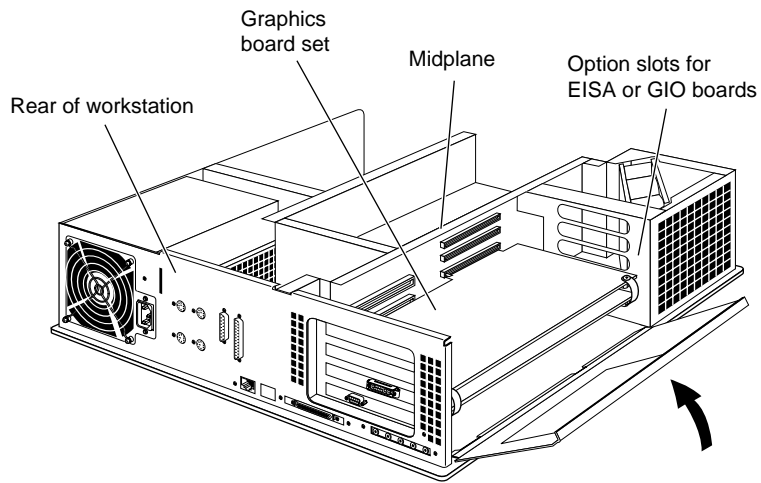
Figure 5-66   Closing the Metal Panel

You are finished replacing the Indigo^2 High IMPACT or Maximum IMPACT graphics board set.

Connecting the Midplane Power Cables

Locate the power supply.

1. Disconnect the power supply cables from their storage site on the power supply. See Figure 5-67.

   ■ Pinch together the corrugated edges on the ribbon cable connector, and pull to disconnect it.

   ■ Pull gently on the twisted-pair connector to disconnect it.
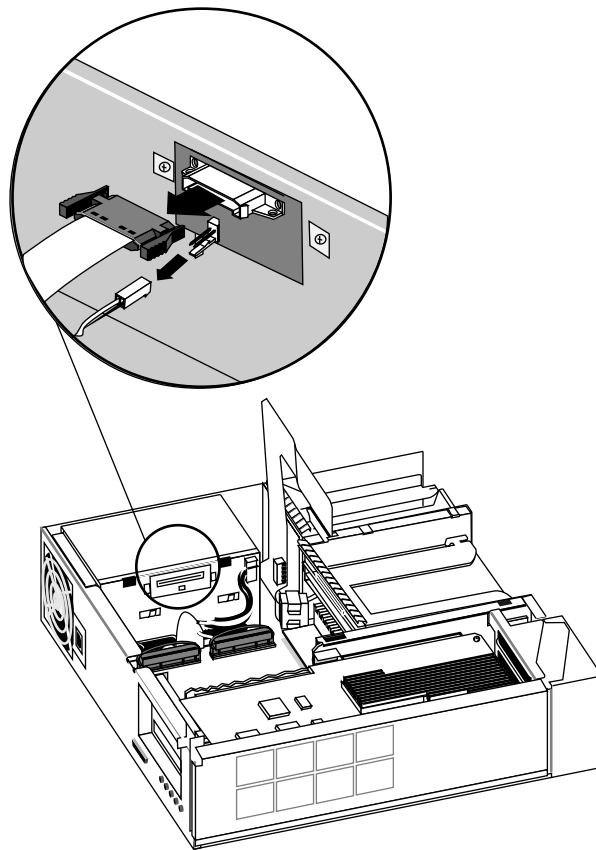
Figure 5-67   Disconnecting the Power Cables From Their Storage Site

2. Connect the ribbon cable and twisted-pair cable to the gold-colored midplane.

   ■ Pinch together the corrugated edges on the ribbon cable connector, and connect it to the midplane. See Figure 5-68.

   ■ Push gently on the twisted-pair connector to connect it to the midplane.
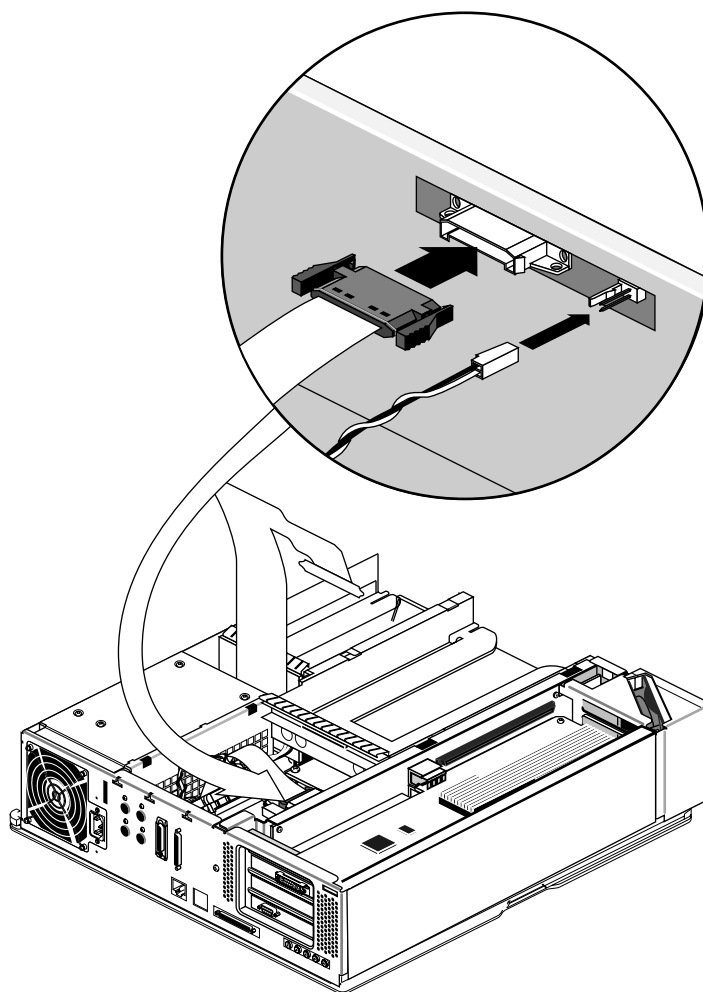
Figure 5-68   Connecting Midplane Power Cables

3.   Remove the antistatic wrist strap.

4.   To replace the cover, and power on the system, turn to the next page.

Congratulations! You are finished upgrading your Indigo^2 IMPACT Ready workstation to an Indigo^2 IMPACT workstation.

Replacing the Cover

To replace the top cover, follow these steps:

1. Locate the tabs on the inside and back of the top cover and the slots on the back of the workstation. See Figure 5-69.
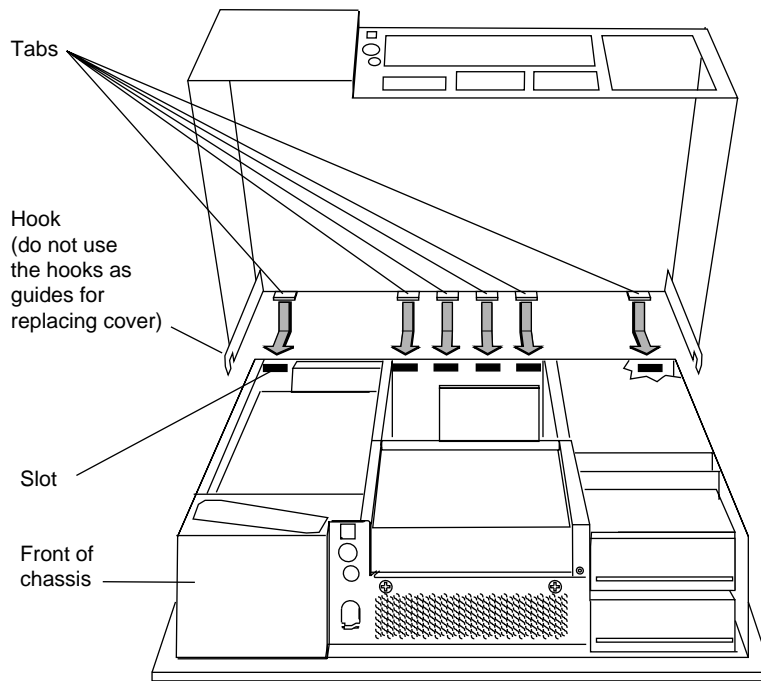
Figure 5-69   Replacing the Top Cover

2. Face the front of the workstation.

   ■   Look through the slots as you lower the cover and move the tabs into place.

   ■   Slide the tabs into the slots and pull the cover down until it snaps into place. The cover fits tightly over the workstation.

3. Replace the bezel.

    ■   Place the tabs on the bottom of the bezel into the grooves in the front of the chassis, as shown in Figure 5-70.
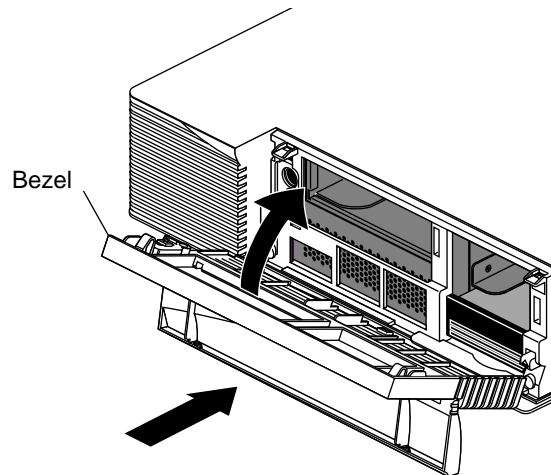
Bezel

Figure 5-70   Replacing the Bezel

4. Tilt the bezel up until it snaps into place.

5. Reinstall the lockbar if you had one installed.

    ■   Slide it through the bezel and out the back of the workstation.

    ■   Reattach the lock.

6. Close the front panel of the bezel.

7. Reconnect the cables to their connectors on the back of the Indigo^2 IMPACT workstation.

8. You are ready to power on the system.

Installing and Removing Peripherals: Internal and External Devices

This chapter describes how to install internal drives in your Indigo^2 IMPACT workstation and how to connect external audio and SCSI devices.

Installing and Removing Peripherals: Internal and External Devices

This chapter tells you how to install

- internal drives

- external SCSI drives

- serial devices

- audio devices

To install a peripheral, you first install the hardware, then bring up the system software so that the system can recognize the peripheral.

Installing an Internal Drive

This section tells you how to install internal drives in the Indigo^2 IMPACT workstation. Types of internal drives include the system disk drive, secondary hard disk drive, floppy drive, floptical drive, CD-ROM, tape drive, and DAT drive. Purchase internal drives that are supported by Silicon Graphics, or they might not work with your system.

Caution: Drives can be easily damaged. Handle your drive carefully. Do not drop it or abuse it.

Shutting Down and Powering Off the System

To shut down and power off the system, follow these steps:

1. Open the front cover.

2. Press and release the power switch on the front of the system to shut down the software and power off the system.

    The system powers off automatically.

3. Press the monitor power switch to turn off your monitor.

4. Disconnect the power cable from the back of the workstation.

Removing the Bezel

To remove the bezel, follow these steps:

1. Press down on the tabs on each side of the bezel, as shown in Figure 6-1.
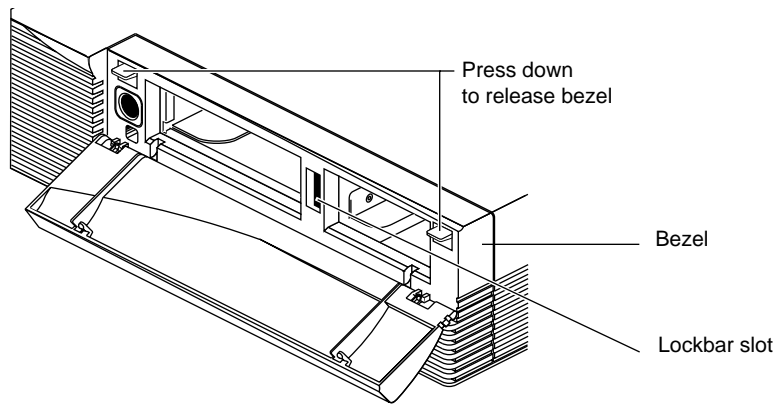
Figure 6-1   Releasing the Bezel

2. Pull the bezel away from the chassis, as shown in Figure 6-2.
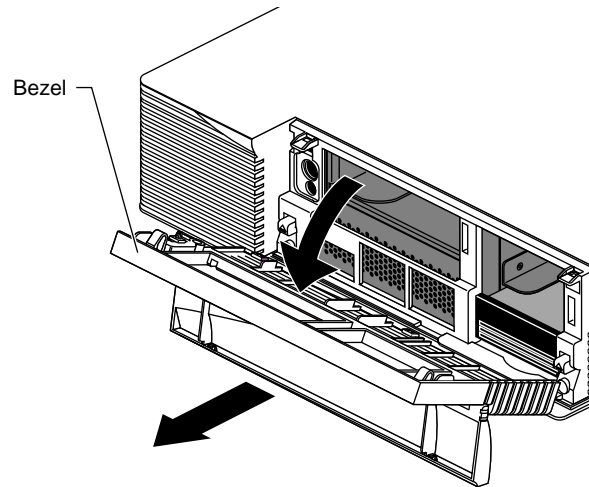
Bezel

Figure 6-2   Removing the Bezel

Installing the Drive

To install a drive, follow these steps:

1. Choose a slot in which to install the drive. The slots are shown in Figure 6-3.

    Caution: Install only the system disk in the bottom slot.

    •   Install a hard disk, floppy drive, a floptical drive, or a DAT drive in the 3-1/2"
        drive slot above the system drive slot.

    •   Install a hard disk, CD-ROM, or QIC tape drive in the 5-1/4" drive slot on the
        left. Do not use 3-1/2" drives with removable media (such as floppy or DAT) in
        this slot, or the system cooling may not work correctly.
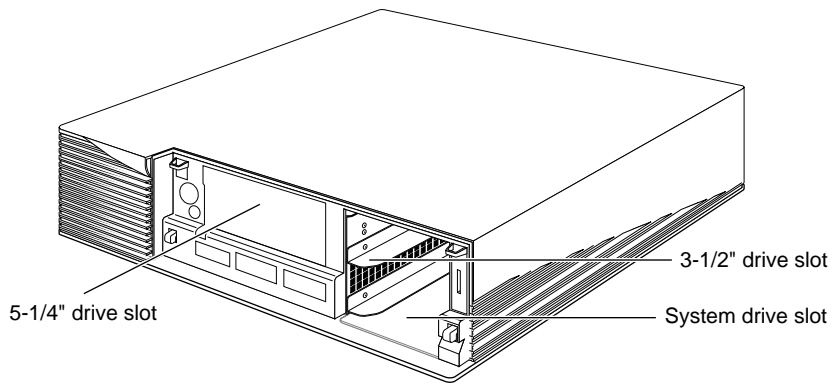
Figure 6-3   Locating the Drive Slots in the Front of the Chassis

2. Install the drive, as shown in Figure 6-4.

    ■ Pick up the drive so that the lever is facing you and is on the bottom of the drive.

    ■ Slide the drive into the slot, making sure that the guides underneath the drive line up with the guides in the Indigo^2 IMPACT chassis. As you slide the drive in, the lever moves to the right.

    ■ Push the drive in firmly until you feel solid resistance.

    ■ Push the lever all the way to the right. This locks the drive in place. The lever should be flush with the front of the drive.

5-1/4" drive slot, for a CD-ROM, QIC tape, or 3-1/2" hard disk drive

3-1/2" drive slot, for a floppy, DAT, or hard disk drive
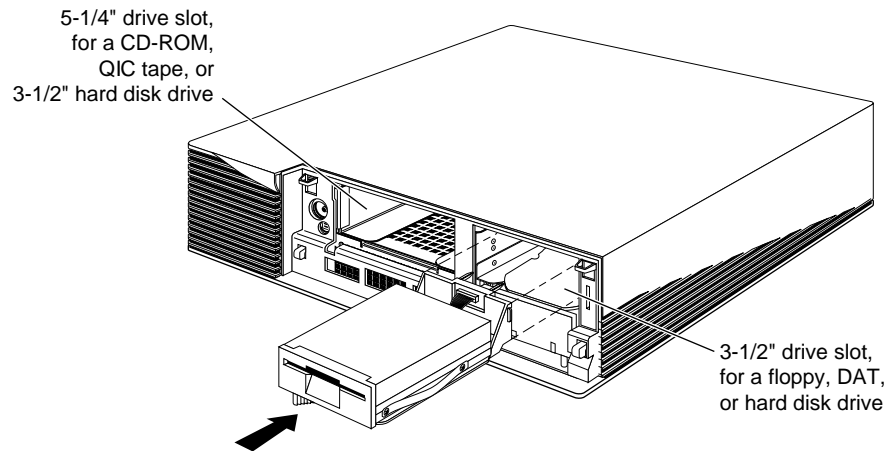
Figure 6-4   Installing an Internal Drive

Replacing the Bezel and Turning On the Power

To replace the bezel, follow these steps:

1. Remove the blanking panel from the bezel.

    This allows you to insert media into the drive without removing the bezel.

    ■   Push the blanking panel out from the back of the bezel. The panel falls out. Save the panel in case you ever remove and do not replace your drive.

2. Replace the bezel.

    ■   Place the tabs on the bottom of the bezel in the grooves in the front of the chassis, as shown in Figure 6-5.

    ■   Tip the bezel up until it snaps into place.
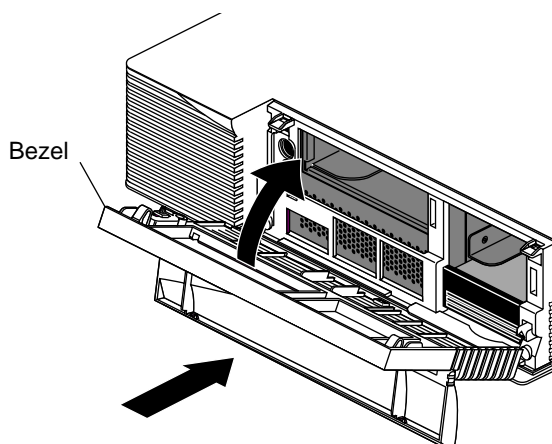
Figure 6-5   Replacing the Bezel

3. Press and release the power switch on the front of the Indigo^2 IMPACT workstation.

4. Close the front cover.

When you see the login screen, you are ready to log in. Go to the next section, "Testing the Internal Drive."

Testing the Internal Drive

The system automatically sets up the system software for most internal devices you install and places an icon on the desktop.

Once you install the drive, follow these steps to check that the system recognizes the new drive.

1. Log in to your account. For more information on logging in, refer to "Logging In to the Workstation" on page 32.

2. If the device is installed correctly, you should see an icon for it on the desktop. Double-click the icon to set up the drive.

3. You can also use the System Manager to check that the drive is shown correctly.

    ■   From the System toolchest, select "System Manager." You see a window showing Hardware and Shared Resources.

    ■   Pull down the Hardware menu and select "Disks." You see a list of installed drives.

If the drive you installed does not appear, power off the system and make sure the drive is installed all the way in the slot. Then restart the system and check the System Manager listing again.

If You Installed a CD-ROM Drive

If other users are going to access your CD-ROM drive, refer to the online *Personal System Administration Guide* for special instructions. Select "Online Books" from the Help Toolchest. Then select the *Personal System Administration Guide*, and search for "Setting Up SCSI Peripherals."

If You Installed a Floppy or Floptical Disk Drive

If you are using the drive as an IRIX device, follow these steps to format a floppy or floptical disk, if necessary:

1. Choose "Disk Manager" from the System toolchest.

    You see a photo of the drive with a labeled button underneath it.

2. Click the button beneath the photo of your floppy or floptical drive.

    You see the "Disk Information" window.

3. Click the "*Initialize*" button.

Floppy disks take about 2 minutes to format; floptical disks take about 10 minutes.

For more information on formatting disks, select "Online Books" from the Help toolchest and search for "Formatting Floppy and Floptical Disks" in the *Personal System Administration Guide*.

You are finished formatting the floppy or floptical disk.

Ejecting a Floppy or Floptical Disk

Follow these steps to eject a floppy or floptical disk from the disk drive.

1. On your *desktop*, make sure the *floppy* or *floptical* icon is selected.

2. Press the right mouse button and select "Eject Floptical." Or, from the Selected toolchest, choose "Eject Floptical."

If You Installed a Tape Drive

The software automatically recognizes any tape drives you install. The tape drive is ready to use.

For information on backing up data onto a tape, select "Online Books" from the Help toolchest. Then select the *Personal System Administration Guide*, and search for "Backing Up and Restoring Files."

Cleaning DAT Drives

If you use your DAT drive frequently, magnetic dust or debris can collect on the heads of the drive. This can make your DAT tapes unreadable or unwritable.

If the green LED on the front of the DAT drive flashes at about 5-second intervals, you should clean the DAT drive heads. You should clean your DAT drive after about every 30 hours of use.

Follow these steps to clean your DAT drive:

1. Insert a DAT cleaning cassette tape.

    Note: Be sure to use a cleaning tape authorized by the DAT drive manufacturer.

    The drive loads the tape and cleans the heads automatically.

2. The DAT drive will eject the cleaning tape when the cleaning is complete.

3. If the green LED on the front of the DAT drive continues to flash at about 5-second intervals after you have cleaned the drive, you may have a problem with your cleaning-tape, or your drive may need cleaning by an authorized service provider.

    ■ First, try cleaning your drive again with a new DAT cleaning cassette tape.

    ■ If the LED continues to flash, take your drive to an authorized service provider for professional cleaning.

Removing Internal Drives

For instructions on removing internal drives, go to "Removing and Replacing Internal Drives" on page 289.

If you remove a secondary hard drive, floppy drive, or floptical drive and do not intend to replace it, you need to inform the system that the drive is no longer there. For more information, select "Online Books" from the Help toolchest, and search for "Removing a Disk" in the *Personal System Administration Guide*.

Installing External SCSI Devices

All external SCSI devices should be Silicon Graphics supported or they might not work with your system.

This section explains how to connect external SCSI devices to the Indigo^2 IMPACT workstation. External devices include a QIC tape drive, CD-ROM drive, SCSI scanners, or other external SCSI devices.

Follow the steps below to connect an external SCSI device to your Indigo^2 IMPACT workstation.

Assigning a SCSI Address to the External Device

Before shutting down your system and installing an external device, you need to assign an address to the device.

- If you currently do not have any extra internal devices or external devices attached to your system, you can assign any number from 1 to 7 to the new device. Do not use address 0, as this is the system SCSI ID. Skip to "Setting the SCSI Address on the External Device."

- If you have at least one or more internal or external devices attached to your system and you are adding another device, you must check which addresses are assigned to the existing external devices and then choose a number between 1 and 7 that has not already been assigned.

To check available addresses for external devices, follow these steps:

1. If the Indigo^2 IMPACT workstation is powered off, 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 and release the power switch to turn on the system.

2. Log in to your account. For more information on logging in, refer to "Logging In to the Workstation" on page 32.

3. When the system comes up, select "System Manager" from the System toolchest.

4. Pull down the Hardware menu and select "Summary."

   You see a listing of your system's hardware devices and their address numbers.

5. Choose a number from 1 to 7 that is not assigned to your current devices and then go to the next section, "Setting the SCSI Address on the External Device."

Setting the SCSI Address on the External Device

Now you must manually set the address you chose in step 5 above on the external device.

This is done in a number of ways, depending on the device. Most SCSI devices have a push-button, switch, dial, or jumpers that you set to determine the SCSI address.

If the device has a switch or dial on the back, follow the steps below. If there is no switch or dial on the device, see the instructions included with the device.

1. Take the device out of its box and locate the push-button, switch, or address dial. It may be on the rear or bottom of the device.

2. Use a small screwdriver or pencil tip to set the dial or push the buttons to assign the address number you chose in step 5.

   Caution: Do not assign number 0! This number is reserved for the SCSI controller.

Attaching the Device

You can attach one or more external devices to the SCSI port on the back of your workstation. Connecting more than one device is called *daisy chaining*. The devices are connected in a chain, with the first device attached to the SCSI port on the workstation. If any of the external devices are FAST SCSI-2, do not daisy-chain more than two enclosures, containing up to seven devices.

If one or more of the devices you are attaching to your workstation is a FAST SCSI-2 device, then the maximum combined cable length of all SCSI cables should not exceed three meters. If you are not attaching any FAST SCSI-2 devices, then the maximum combined cable length of all SCSI cables should not exceed six meters.

Additionally, if any of the external devices are FAST SCSI-2, it is extremely important that you use a cable of controlled impedance, and with impedance-matched connectors. Not all cables with the correct connector will work. This is particularly important if you have more than one external device.

Note: Use the cables and active terminator that came with the FAST SCSI-2 device, or purchase an active terminator, if necessary. You must use an active terminator. (The terminator provided with the system is an active terminator.) Using other types of cables or terminators can result in your system malfunctioning. If you have a device that you want to attach to your system, but you do not have the appropriate cables, you can order them by contacting your service provider.

To attach an external device, follow these steps:

1. Shut down and power off the system.

   ■ Open the front cover.

   ■ Press and release the power switch on the front of the system to shut down the software and power off the system.

     The system powers off automatically.

   ■ Press the monitor power switch to turn off your monitor.

2. Remove the active SCSI terminator from the workstation or from the last external device attached to your workstation.

   ■ If you are attaching the device to the workstation, remove the terminator from the SCSI connector on the Indigo² IMPACT workstation by squeezing the clips on both sides of the terminator and pulling it off. (See Figure 6-6.) Save the terminator. You must reattach it to the SCSI connector if you remove and do not replace the external device.
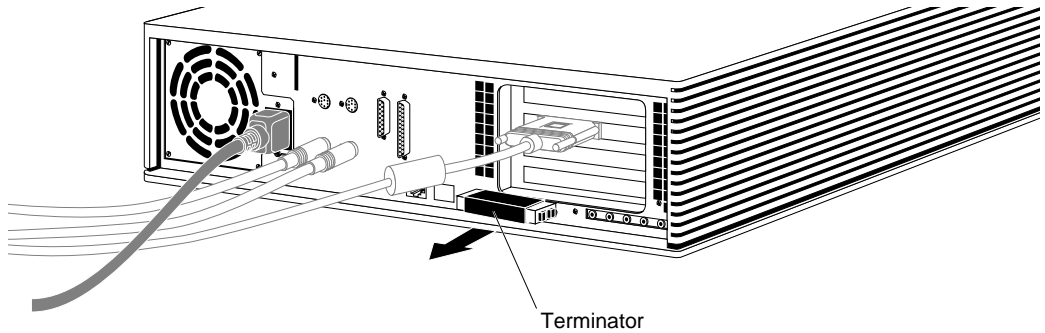
Terminator

Figure 6-6   Removing the Terminator From the Indigo² IMPACT Workstation

■ If you are daisy-chaining a device to another device, remove the terminator from the connector on the last device in the chain by squeezing the clips on both sides of the terminator and pulling it off. See Figure 6-7.
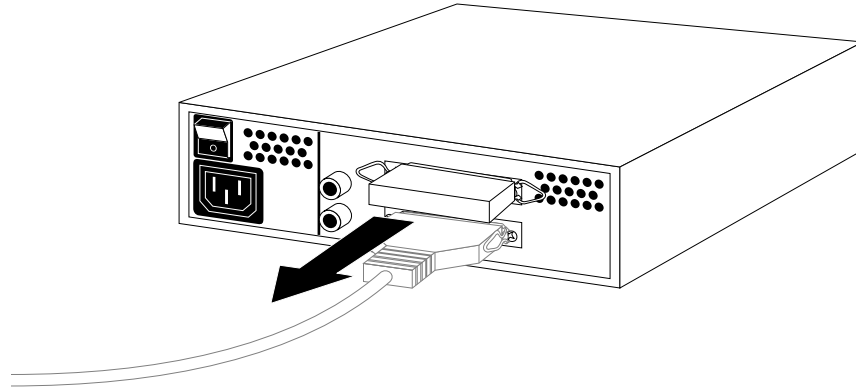
Figure 6-7   Removing the Terminator From the Last Device on the Daisy Chain

3. Choose the appropriate SCSI cable to connect the external SCSI device.

   Caution: For external fast SCSI devices to operate reliably, the maximum combined cable length of all external SCSI cables cannot exceed three meters. Additionally, fast SCSI devices require higher quality cables than early SCSI devices. Use the cable and active terminator that came with the device. Using other types of cables or terminators can result in your system malfunctioning.

   ■ If you are attaching the device to the workstation, use the high- density 68-pin to Centronics® 50-pin FAST SCSI 2-cable; that is, the one with a different connector on each end.

   ■ To daisy-chain a device to another device, use a Centronics 50-pin to Centronics 50-pin half-meter or meter cable; that is, it has identical connectors at each end.

4. Connect the SCSI cable.

    ■   Connect the other end of the SCSI cable to one of the SCSI connectors on the back of the device and secure the clips on each side of the connector.
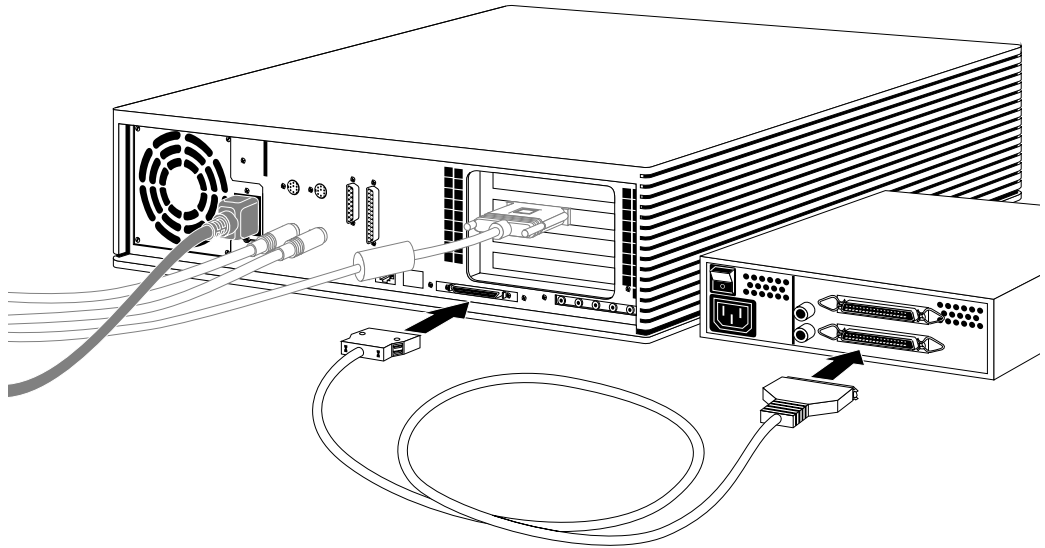
Figure 6-8   Connecting an External SCSI Device to the Indigo^2 IMPACT Workstation

- If you are daisy-chaining a Silicon Graphics device to another Silicon Graphics device, use the cable that has identical connectors at each end. (The connectors on the cable must match the connectors on the devices you are attaching.)

- Connect one end of the cable to the open connector on the first device, as shown in Figure 6-9.

- Attach the other end to one of the connectors on the device you are adding.
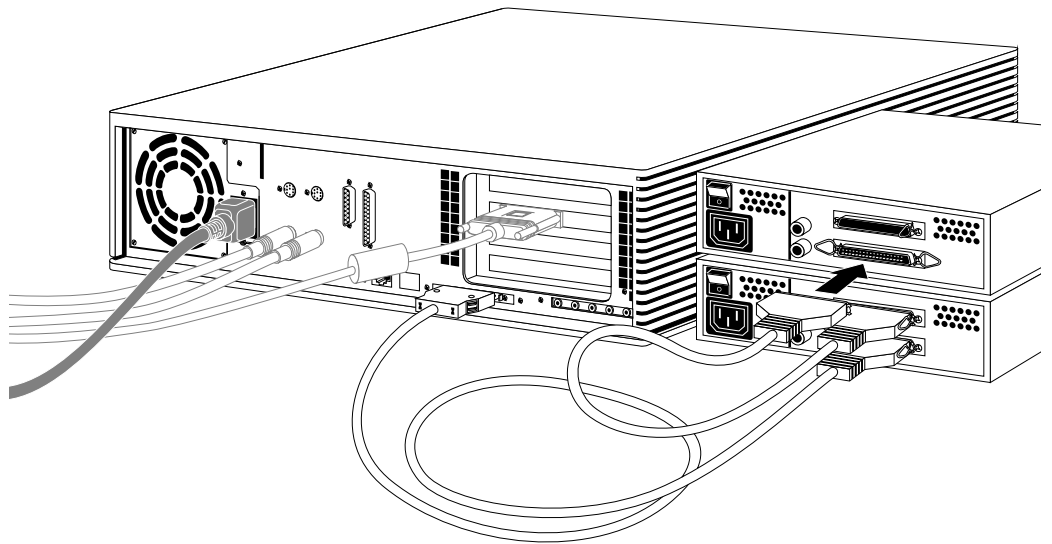
Figure 6-9   Daisy-Chaining an External SCSI Device to Another External SCSI Device

5. Gently place the terminator you received with the device onto the open SCSI connector on the back of the last device on the daisy-chain, as shown in Figure 6-10, and secure the clips on each side of the terminator.

   The SCSI connector is designed so that you can put the terminator on only one way, if not forced.

.
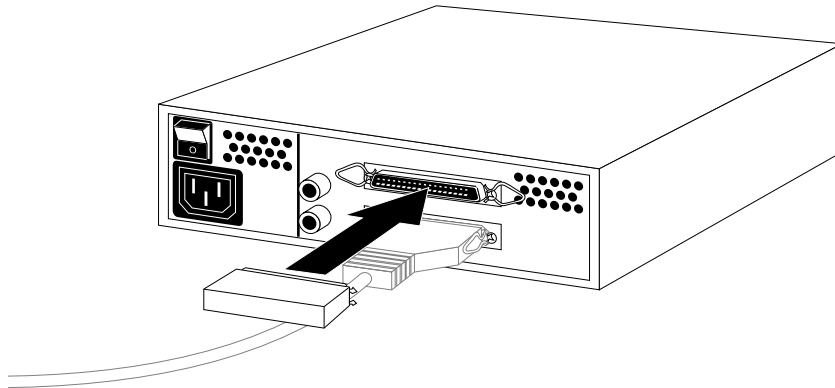
Figure 6-10   Attaching a Terminator to an External SCSI Device

6. Connect one end of the power cable that came with your device to the power connector on the back of the device, as shown in Figure 6-11.
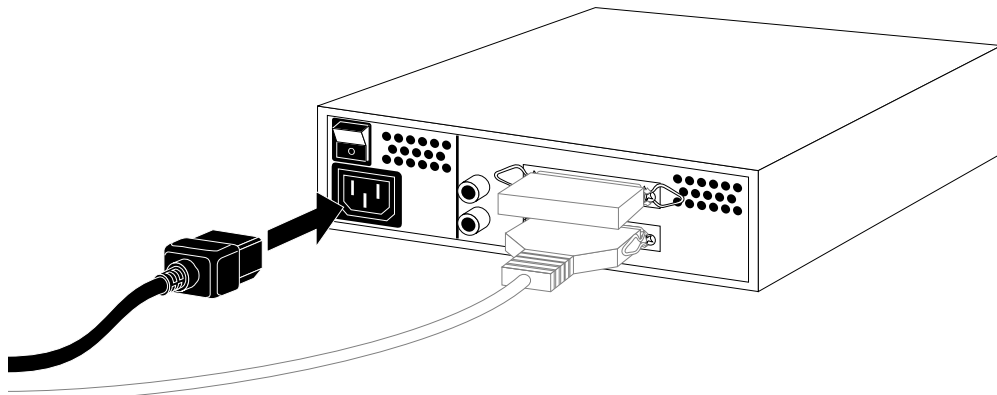
Figure 6-11   Connecting the Power Cable to an External Device

7. Plug the other end of the power cable into a grounded three-pronged electrical outlet.

Note: Remember to turn on the external devices first and then your workstation to make sure the devices are recognized.

You are now ready to power on your system and check to make sure that the device is recognized.

Testing the External Device

After you've attached the device to your workstation, check to make sure your system recognizes the device.

The system automatically sets up the system software for most external devices you install and places an icon on the desktop.

To check the system configuration, follow these steps:

1. Turn on the external device first. External devices can be turned on in any order, as long as you turn them on before turning on your workstation. The power switch is on the back of the device.

   Hint: Always turn on the external device *before the workstation;* otherwise, the system does not recognize the device.

2. If your workstation is powered off, 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 and release the power switch to turn on the system.

   After a few moments, the system starts up.

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3. When you see the login screen, log in to your account. For more information on logging in, go to "Logging In to the Workstation" on page 32.

   If the device is installed correctly, you see an icon for it on the desktop. Figure 6-12 shows the icon for a CD-ROM drive.

Figure 6-12   CD-ROM Icon

You can also use the System Manager to check that the drive is shown correctly.

1. From the System toolchest, select "System Manager." You see a window showing Hardware and Shared Resources.

2. Look for the device you installed under Shared Resources.

If the device you installed does not appear, do the following:

1. Power off the system.

2. Check that you've connected the correct SCSI cable to the drive.

3. If the drive is the last SCSI device on the daisy chain, make sure it has a terminator installed on it.

4. Restart the system and check the System Manager listing again.

If You Installed a Floppy or Floptical Drive

If you are using the drive as an IRIX device, see "If You Installed a Floppy or Floptical Disk Drive" on page 185 for instructions on formatting and ejecting a floppy disk.

If You Installed a CD-ROM Drive

The software automatically recognizes any CD-ROM drives you install. If other users are going to access your CD-ROM drive, refer to the online *Personal System Administration Guide* for special instructions. Select "Online Books" from the Help toolchest. Then select the *Personal System Administration Guide*, and search for "Setting Up SCSI Peripherals."

If You Installed a Tape Drive

The software automatically recognizes any tape drives you install. The tape drive is ready to use.

For information on cleaning DAT drives, see "If You Installed a Tape Drive" on page 186.

For information on backing up data onto a tape, select "Online Books" from the Help toolchest. Select the *Personal System Administration Guide*, and search for "Backing Up and Restoring Files."

If You Installed a Printer

If you installed a printer, select "Printer Manager" from the System toolchest, and set up the printer. For more information on setting up the printer, select "Online Books" from the Help toolchest. Select the *Personal System Administration Guide*, and search for "Setting Up Network, Peripheral, and Printer Connections."

Installing Serial Devices

This section tells you how to install serial devices. Serial devices include

- dial and button boxes
- dials boxes
- digitizer tablets
- console terminals
- modems

Attaching the Device

To install a serial device, follow these steps:

1. Unpack the serial device and cables.

2. Locate the serial ports on the back of the Indigo^2 IMPACT workstation, as shown in Figure 6-13.

   The serial ports are labeled **1** and **2** and are MINIDIN 8 connectors.
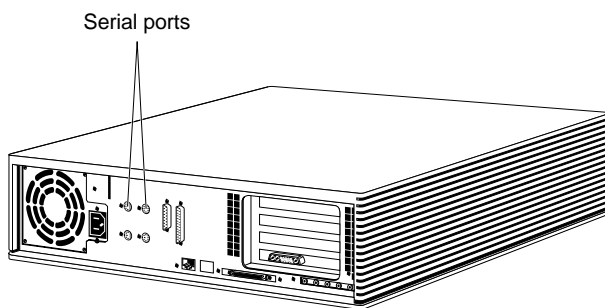
Serial ports

Figure 6-13   Locating the Serial Ports on the Back of the Indigo^2 IMPACT Workstation

3. Plug in the serial cable.

   If you are attaching a console terminal, attach it to serial connector **1** only. If you are attaching any other device, you can attach it to either connector.

   ■ Plug one end of the serial cable into the connector on the back of the serial device.

   See the instructions that came with the serial device for detailed instructions on how to connect the cable to the device.

   ■ Plug the other end of the cable to the serial connector on the back of the Indigo[2] IMPACT workstation, as shown in Figure 6-14.
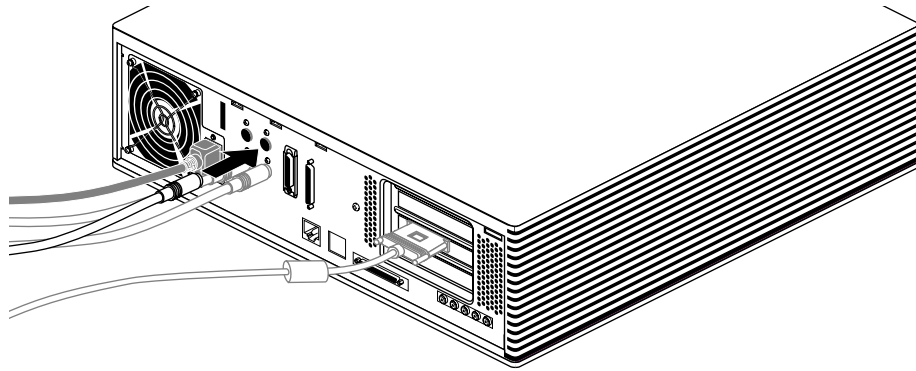
Figure 6-14   Connecting the Serial Cable to the Serial Port on the Indigo[2] IMPACT Workstation

   Note: If you are installing a dial and button box, a small serial adapter cable came with the box. First connect the serial adapter cable to the serial cable. Then connect the other end of the serial adapter cable to the Indigo[2] IMPACT workstation.

4. Plug in the serial device's power cable (if any).

   ■ Plug the socket end of the power cable into the power connector on the back of the serial device.

   ■ Plug the other end into a grounded three-pronged wall outlet or power strip. (Do not use a two-pronged adapter.)

Note: For information on using other serial cables, see "Other Serial Cables" on page 200.

Configuring the Device

Once the device is connected to the workstation, you need to configure it. Select "Online Books" from the Help toolchest. Select the *Personal System Administration Guide*, and search for "Setting Up Serial Peripherals."

Other Serial Cables

You may want to connect other serial devices to your workstation. The next section, "Printer or Dumb Terminal Serial Cable," contains serial cable information for your Indigo[2] IMPACT workstation.

Printer or Dumb Terminal Serial Cable

To use serial printers and dumb terminals, use a 3-wire standard Macintosh® (Plus, SE, or II) to ImageWriter® I cable. (The ImageWriter II cable does not work.) The cable connector pinout assignments for this cable are shown in Table 6-1.

Table 6-1 Cable Connector Pinout Assignments for Printer or Dumb Terminal Serial Cable

Signal Description	Pin Number DIN-8 Connector (Male)	Pin Number DB-25 Connector (Male)
	1	N/C
	2	N/C
TXD	3	3
GND	4	7
RXD	5	2
	6	N/C
	7	N/C
GND	8	7

Note: For a 3-wire cable and no hardware flow control modem, you must use the */dev/ttyd** command devices in the configuration files. For more detailed information, see the *serial* reference (man) page. To access the reference (man) page, place the cursor in the console window and type

```
man serial
```

Modem Cable

Use a full-handshake (includes RTS and CTS) serial cable for a modem with RTS/CTS flow control. You can use this cable for all serial devices except terminals and serial printers (any application that doesn't need RTS flow control). For example, you can use this cable for a 3-wire application. It can be used with a null modem adapter for serial printers and dumb terminals. You can purchase the full-handshake serial cable from Silicon Graphics or your local service provider.

The cable connector pinout assignments are shown in Table 6-2.

Note: Do not use a standard Macintosh serial cable. It does not have the correct number of connectors for full flow control.

Table 6-2   Cable Connector Pin Assignments for a Modem Cable

Signal Description	Pin Number DIN-8 Connector (Male)	Pin Number DB-25 Connector (Male)
DTR	1	20
CTS	2	5
TXD	3	2
GND	4	7
RXD	5	3
RTS	6	4
DCD	7	8
GND	8	7

Note: If you are attaching a modem with modem signals and RTS/CTS flow control, you must use the */dev/ttyf** command devices in the configuration files. For more detailed information, see the *serial* reference (man) page. To access this reference (man) page, place the cursor in the console window and type

```
man serial
```

Serial Devices Using a Silicon Graphics Adapter Cable

To use the devices below, you'll need a serial adapter cable supplied by Silicon Graphics:

- dial and button box

- dials box

- digitizer tablet

- Spaceball™

The Silicon Graphics adapter cable is used to convert the serial cable that came with the device to a Silicon Graphics DIN-8 serial cable connector. This cable then connects to the serial connector on the back of the Indigo^2 IMPACT workstation. The cable connector pinout assignments are shown in Table 6-3.

Table 6-3   Cable Connector Pinout Assignments for the Silicon Graphics Adapter Cable

Signal Description	Pin Number DIN-8 Connector (Male)	Pin Number DB-9 Connector (Female)
DTR	1	9
CTS	2	5
TXD	3	2
GND	4	7
RXD	5	3
RTS	6	4
DCD	7	8
GND	8	7
	N/C	6
	N/C	1

Serial Devices Using a PC Adapter Cable

To use a serial device designed for use with personal computers using a DB-9 connector, you'll need a PC adapter cable supplied by Silicon Graphics. This adapter cable is used to convert from the PC's DB-9 pinout to the Indigo[2] IMPACT workstation's DIN-8 pinout.

The cable connector pinout assignments for the PC adapter cable are shown in Table 6-4.

Table 6-4   Cable Connector Pinout Assignments for the PC Adapter Cable

Signal description	Pin Number DIN-8 Connector (Male)	Pin Number DB-9 Connector (Male)
DTR	1	4
CTS	2	8
TXD	3	3
GND	4	5
RXD	5	2
RTS	6	7
DCD	7	1
DSR	8	6
	N/C	9

Installing Audio Devices

The following audio ports are located on the back of the Indigo^2 IMPACT workstation:

- microphone in
- line in
- line out
- headphone out
- digital I/O

Microphone input   Line output   Digital input/output

Line input   Headphone output
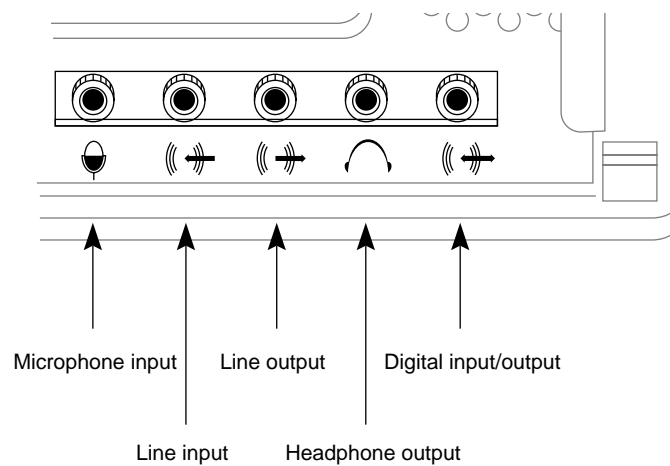
Figure 6-15   Audio Ports on the Back of the Indigo^2 IMPACT Workstation

Audio jacks accept stereo 3.5-mm phone plugs. See Appendix A, "Cable Pinout Assignments," for cable pinout information.

To connect an audio device, plug the device cable into the appropriate port, as shown in Figure 6-15 and Figure 6-16.
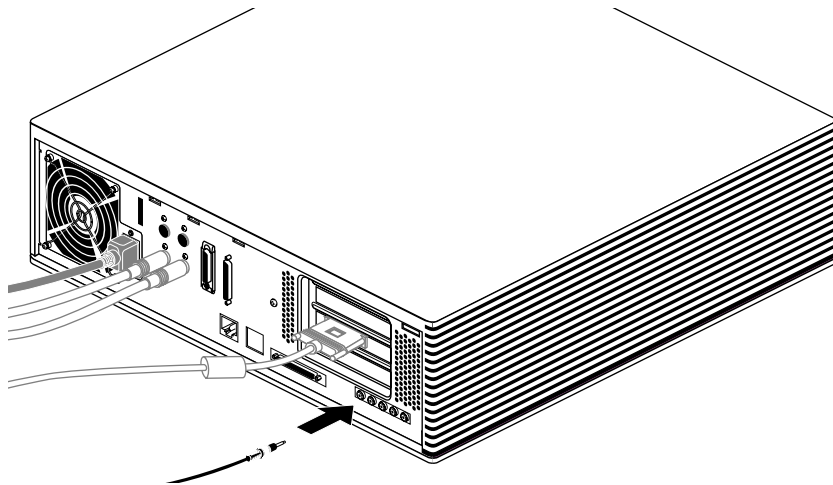
Figure 6-16   Connecting an Audio Device to the Indigo[2] IMPACT Workstation

For information on audio tools available on your workstation, choose "Online Books" from the Help toolchest and select the *Media Tools User's Guide*.

Installing and Removing Software

This chapter describes how to install and remove Silicon Graphics software products on your Indigo^2 IMPACT workstation.

Installing and Removing Software

This chapter describes the software installation tools that you use to install a new version of the operating system, and to install optional software products that you received from Silicon Graphics. To install products from other vendors, please see the software installation instructions that accompany those products.

You can install software from

- a CD-ROM drive that's connected either to your system or to another Silicon Graphics system on your network

- a remote directory on another Silicon Graphics system or any system that supports *bootp* and *tftp*

Only the *administrator* can install or remove software if there is a password on the administrator (root) account.

Software Installation Tools

Silicon Graphics ships two software installation tools:

- *Inst* is a command-line tool for installing new versions of the operating system. This tool works when the system is running a small version of the operating system (the miniroot) to minimize the possibility of installation errors. You can also use this tool to install optional products that do not require miniroot installation, but Silicon Graphics recommends using the graphical Software Manager.

- Software Manager is a graphical tool for installing optional products. This tool works only when the system is up and running; you start it by choosing "Software Manager" from the System toolchest.

  Note: Software Manager is available on systems running IRIX release 5.3 and greater.

For more information on installing optional products, see the Software Manager online help, or choose "Online Books" from the Help toolchest, and see Chapter 4 of the online *Personal System Administration Guide*.

For information on installing a new version of the operating system software, see the next section in this chapter. For detailed information on using *Inst*, see the online *Software Installation Administrator's Guide*.

Installing a New Version of the Operating System Software

The *administrator* can install a new version of the IRIX operating system and any optional software by following these steps:

1. Make a full system backup. For more information, select "Online Books" from the Help toolchest and search for "Backing Up and Restoring Files" in the online *Personal System Administration Guide*.

2. If you do not have a CD drive connected directly to your system, find a CD drive on your network.

   - Choose "Disk Drives" from the Search For rollover menu in the Find toolchest.

   - In the Search window, choose "Type" from the Match menu, and choose "CD-ROM" from the *menu button* next to *whose type is*. See the online help in the Search window for details.

   - Click the *Search* button to find the drive.

   - When the drive's icon appears, it is labeled *systemname*:cdrom. *systemname* is the name of the system to which the drive is connected.

     Note: If the search does not find a device that you know is available, choose "Online Books" from the Help toolchest and see "Troubleshooting Network Errors" in the online *Personal System Administration Guide*.

   - Contact the administrator of the system to which the drive is connected, and make sure remote installations are allowed from that CD drive. For more information, select "Online Books" from the Help toolchest and search for "Allowing Remote Users to Install Software From Your CD Drive" in the online *Personal System Administration Guide*.

3. Insert the operating system CD into the drive you are going to use.

4. Check the full pathname of the drive.

   ■ If you're using a drive that's connected to your own system, double-click the drive's icon. The title bar shows the full pathname (for example, */CDROM*); write down the pathname, because you will need it in step 7.

   ■ If you're using a remote drive, double-click its icon. A window appears in which the field labeled "Open Remote Directory" shows the full pathname of the CDROM directory (for example, */CDROM*). Write down the full name, then click the *Cancel* button to close this window.

5. Read and, if you like, print all or part of the online release notes.

   ■ If you're using a drive that's connected to your own system, double-click the drive's icon, then, in the directory view window that appears, double-click the CDgrelnotes icon to view the release notes. To print all or part of the release notes, choose "Print" from the File menu.

   ■ If you're using a remote drive, double-click its icon. In the Open Remote Directory window, click the *OK* button, then, in the directory view window that appears, double-click the CDgrelnotes icon to view the release notes. To print all or part of the release notes, choose "Print" from the File menu.

6. Shut down the system, restart it, and start the software installation tool.

   ■ Choose "System Shutdown" from the System toolchest.

   ■ When you see the dialog box that says *Are you sure you want to shut down the system right now,* click the *OK* button.

     You see a dialogue box that says *System is Shutting Down*.

   ■ When you see a dialogue box or message that says *Okay to power off*, click the *Restart* button in the dialogue box, or press any key.

   ■ When you see a dialogue box or message that says *Starting up the system*, click the *Stop for Maintenance* button, or press `<Esc>`.

   ■ Click the icon labeled *Install System Software*.

7. Specify the location of the new software to install.

■ If the CD is in a drive connected to your system, click the *Local CD-ROM* icon. When the notifier appears asking you to insert the CD, insert the CD in the drive, and click *Continue*.

■ If the CD is in a drive that's connected to another system on the network, click the *Remote Directory* icon. When a notifier appears asking you for the remote hostname, type the system's name, a colon (**:**), the full pathname of the CD (which you found in step 4), and add *dist* to the end. For example, to access a CDROM on the system mars, enter:

   mars:/CDROM/dist

   When the notifier appears asking you to insert the CD, insert the CD in the drive and click *Continue*.

   Note: If you see error messages after you specify the location, see "System Cannot Find the New Software" on page 219.

8. When the system finds the software, it takes several minutes to copy the software installation tools onto your system. The system is ready to install software when you see the *Inst* menu:

```
1. from [source]
2. list [keywords] [names]
3. go
4. install [keywords] [names]
5. remove [keywords] [names]
6. keep [keywords] [names]
7. step [keywords] [names]
8. view [args]
9. conflicts [choice...]
10. help [topic]
11. admin
12. quit

Inst>
```

9. Install all or some of the subsystems that make up the operating system and optional software.

   ■   To install all of the *default subsystems*, enter:

   go

   ■   To install all optional and required subsystems that are available on the CD, enter:

   install all

   go

   Note: Usually you do not want to install all subsystems, because they occupy a very large amount of disk space. See the online release notes for product sizes.

   ■   To select only required subsystems or to select all required subsystems plus some optional subsystems, see "Choosing Subsystems to Install or Remove" on page 214.

If you see an error message that says the system cannot find the software, see "System Cannot Find the New Software" on page 219. If you see any other messages, see "System Cannot Complete an Installation" on page 220.

During the installation, you see several progress report messages. The installation is complete when you see this message:

```
Installation and removals were successful
1. Continue with the session
2. Quit now
Please enter a choice [1]:
```

If you see any other messages, see "System Cannot Complete an Installation" on page 220.

   ■   To quit *Inst*, go to the next step.

   ■   To install optional software from another CD, press **<Enter>**. You may see several messages as *Inst* rebuilds its internal data files. Manually eject the CD from your CD-ROM drive by pushing the eject button; insert the next CD in the drive, then enter:

   from /CDROM/dist

   Go back to step 7 to install the software.

10. When all the software is installed, quit *Inst* by entering:

    2

    You may see several messages as *Inst* communicates your changes to the operating system, and configures the new kernel.

    During its exit procedure, *Inst* may "requickstart" your machine. This process synchronizes the libraries and executables on your machine. This process can take up to 20 minutes. During this time you may see these messages:

    ```
    Building one time quickstart database.
    Requickstarting necessary files.
    Automatically reconfiguring the operating system.
    ```

11. The software is successfully installed and your system is ready to restart when you see this message:

    ```
    Ready to restart the system. Restart? [y, n]
    ```

    Type **y** then press **<Enter>**.

    If you see a different message or question, see "System Reports Errors After an Installation" on page 221.

    The system starts up as usual.

12. When the login window appears, log in to your own account.

13. See your release notes by choosing "release notes" from the Help toolchest, then by choosing products from the Products menu.

    The release notes for each product list the directories where applications are stored on your disk so you can drag icons onto your desktop or onto a particular page of the Icon Catalog. The release notes also cover new features and known problems with the product.

Choosing Subsystems to Install or Remove

When you are running *Inst*, you can see all the *subsystems* that make up the products and check whether they have been selected for installation by entering:

list

You see one or more screens of information.

- To see the next screen, press the spacebar.

- To stop the listing, press **q**; you see the `Inst>` prompt.

- To see the *Inst* menu again, press **?**.

- To see online help, enter: **help**

Note: The remainder of this chapter contains detailed examples of Inst listings and commands that apply to only the IRIX 5.3 version of Inst.If you are running an earlier or later version of Inst, please use the online help that is available by entering **help** at the `Inst>` prompt.

list displays a key to the listing, followed by the list of available subsystems. The first three columns of the listing show

- Whether the available (usually newer) version of a subsystem is selected for installation (i) or is not selected (k).

  Note: If you have a version of a subsystem already installed and you would like to remove it while other software is being installed, enter **remove** *<subsystem>* at the `Inst>` prompt.

- Whether the available software is a new product that has never been installed (N), or is an upgrade to (U), is the same version as (S), or is an older version of (D) a product that is already installed. If no character appears in this column, the product has been available for installation before, but has never been installed; it is considered a "Not Installed" product.

Here are some samples of the first three columns of subsystem listings:

`i U nfs.sw.nis`

> A newer, upgrade version (`U`) of this subsystem (`nfs.sw.nis`) is available and is selected for installation (`i`). It is part of the NFS® product (`nfs`).

`k S pfa.sw.lib`

> An identical version (`S`) of this subsystem (`pfa.sw.lib`) is available, so *Inst* assumes you want to keep (`k`) the currently installed version. It is part of the Power Fortran Accelerator™ product (`pfa`).

```
k D insight.sw.client
```
> The version of this subsystem (`insight.sw.client`) that is available is a downgrade (`D`) to the subsystem that is already installed, so *Inst* assumes you want to keep (`k`) the currently installed version. It is part of the IRIS Insight product (`insight`).

```
i N dmedia_tools.sw.soundtools
```
> The subsystem (`dmedia_tools.sw.soundtools`) that is available is a new product (`N`), which means it has never been installed or available for installation before. It is selected for installation (`i`) because it is a default subsystem. It is part of the Digital Media Tools product (`dmedia_tools`).

```
systour.sw.eoe
```
> This subsystem (`systour.sw.eoe`) has been available for installation before but has never been installed, and it is not selected for installation (no letters precede it). It is part of the System Tour product (`systour`).

The other columns of the listing give the following information:

- The name of the subsystem.

- If the subsystem is required for system operation (r), is selected as a default subsystem by the manufacturer (d), and/or must be installed when the system is running the miniroot (b).

  Note: Most software that is required for system operation must be installed from the miniroot, as well as some optional products. The steps in "Installing a New Version of the Operating System Software" on page 210 detail a miniroot installation.

- How much additional disk space the subsystem will occupy (Space is measure in blocks, where 1 KB = 2 blocks.) A positive number such as +100 shows that it will take an additional 50 KB, while a negative number such as -60 shows that the new version of the subsystem is smaller than the old version and will free 30 KB.

- A brief description of the subsystem.

At the end of the listing, *Inst* shows whether you have enough disk space to install all the subsystems that are selected for installation, including temporary overhead needed for the installation process. For more information on the products and subsystems, see the product's release notes.

You can change which subsystems are selected for installation in these ways:

- To select a subsystem for installation, enter:

  install *subsystem*

  For example, when a new version of a product is available and you have an older version installed, *list* shows you this information:

  ```
  U dmedia_tools.sw.soundtools
  U dmedia_tools.sw.movietools
  U dmedia_tools.data.prosonus
  ```

  To select one subsystem for installation, enter:

  install dmedia_tools.sw.soundtools

  To select all subsystems of the product for installation, enter:

  install dmedia_tools

  list then shows this information:

  ```
  i U dmedia_tools.sw.soundtools
  i U dmedia_tools.sw.movietools
  i D U dmedia_tools.data.prosonus
  ```

- To prevent a new subsystem or a different version of an existing subsystem from being installed, enter:

  keep *subsystem*

  For example, when a large, new subsystem that you do not want to install is selected for installation, *list* shows this information:

  ```
  i N dmedia_tools.data.prosonus
  ```

  To prevent *Inst* from installing it, enter:

  keep dmedia_tools.data.prosonus

  list then shows this information:

  ```
  N dmedia_tools.data.prosonus
  ```

- To remove a subsystem that is currently installed, and to prevent a new version from being installed in its place, enter:

  remove *<subsystem>*

  For example, when a subsystem is already installed and a newer version is available, *list* shows this information:

  ```
  i U dmedia_tools.data.prosonus
  ```

  To remove the current version and prevent *Inst* from installing the new version, enter:

  remove dmedia_tools.data.prosonus

  list then shows this information:

  ```
  U dmedia_tools.data.prosonus
  ```

When you have made your choices, start the installation. At the `Inst>` prompt, enter:

go

Troubleshooting Software Installation

This section covers the three most common problems that may arise during software installation. See the section that describes the problem you have encountered:

- "System Cannot Find the New Software" on page 219
- "System Cannot Complete an Installation" on page 220
- "System Reports Errors After an Installation" on page 221

For comprehensive troubleshooting information, see the online *Software Installation Administrator's Guide*.

System Cannot Find the New Software

The system cannot find the software when

- There is no CD in a drive that you specified.

- The remote CD drive that you specified is not enabled for remote software installation. Contact the administrator of the system to which the drive is connected, and make sure remote installations are allowed from that CD drive. For more information, select "Online Books" from the Help toolchest and search for "Allowing Remote Users to Install Software From Your CD Drive" in the online *Personal System Administration Guide*.

- Your system cannot contact the system on the network that has the software. Select "Online Books" from the Help toolchest and search for "Troubleshooting General Network Errors" in the online *Personal System Administration Guide*.

- You entered an incorrect directory name.

  This typically happens when you are installing from a remote CD drive, and the drive is not accessible from (is not mounted at) the */CDROM* directory. Choose "Disk Drives" from the Find toolchest to find the drive, insert the CD into the drive, then double-click it to see the directory from which you can access it.

  Also, be sure to complete the full pathname with *dist*, which is the name of the directory on the CD in which the software is stored. For example, the full pathname for new software on a CD whose pathname is */drives/cdrom* on a system named *mars* typically is *mars:/drives/cdrom/dist*.

System Cannot Complete an Installation

Typically the system cannot complete an installation if

- There is not enough disk space to install all the products you selected for installation. In this case, you could

    – Select fewer *subsystem*s to install (see "Choosing Subsystems to Install or Remove" on page 214).

    – Remove subsystems that are already installed (see "Choosing Subsystems to Install or Remove" on page 214).

    – Quit *Inst* and remove or archive files or directories if your system is up and running (that is, if it is not doing a miniroot installation such as installing new system software), For more information, select "Online Books" from the Help toolchest, and see "Freeing Up Disk Space" in the online *Personal System Administration Guide*.

- You need to install companion or prerequisite subsystems, or you have chosen to remove subsystems that are prerequisites for subsystems that are already installed or are selected for installation. In this case, you may see this error message:

```
ERROR: Conflicts must be resolved.
```

After this message, *Inst* lists each subsystem that is causing a conflict, and presents options for resolving the conflict. Read the description of each conflict and its resolution options, then choose an option using these guidelines:

    – When you have selected an optional product that is incompatible with the rest of the operating system, do not install it.

    – When you have selected incompatible products, choose to install the newer version of a product.

    – When the system is missing a prerequisite product or subsystem, choose to install the prerequisite.

Each option is numbered; for example, option 1 for the first conflict is numbered 1a; option 2 for the same conflict is 1b. You can choose only one option per conflict. (For more information, or if your system is not running the IRIX 5.3 release, enter **help conflicts**.) To choose option 1a, at the Inst> prompt enter:

conflicts 1a

If you have several conflicts, you can enter your choices all at once. For example, to choose 1a, 2b, and 3b, enter

conflicts 1a 2b 3b

When all conflicts are resolved, you see this message:

No conflicts

To resume the installation, enter

go

System Reports Errors After an Installation

If the system reports errors after an installation is complete, read the error message carefully, and follow its instructions. The message suggests that you type **help** *<topic>* for online instructions.

Warning: **If the errors occur after you install new system software, do not turn off the system or press the Reset button. This could result in a system that cannot restart.**

If you cannot solve the problem using the online help, contact your local support organization.

Troubleshooting

This chapter describes how to diagnose hardware problems on your Indigo[2] IMPACT workstation. It also explains how to run diagnostic tests.

Troubleshooting

This chapter tells you how to

- use system tests to diagnose hardware problems

- recover from a system crash

- disable the workstation password

- turn on an external SCSI device that is installed

To order and replace parts, see Chapter 9, "Ordering, Removing, and Installing Replacement Parts."

Diagnosing Hardware Problems

There are three ways to diagnose hardware problems:

- Power-on tests—tests your major hardware parts as the system is booting up. If a part is faulty, the system notifies you with the LED and error messages.

- Diagnostic tests—more comprehensive tests of your system's hardware. The system informs you if it finds a faulty part.

- Confidence tests—use if you think you have a problem with your keyboard, mouse, monitor, or a peripheral. The confidence tests verify which parts are working correctly.

Power-On Tests

Table 8-1 briefly lists symptoms and probable causes during power-on diagnostics.

Table 8-1   Troubleshooting Symptoms and Probable Causes

Symptom	System State	Cause
No LED	No power to unit	Power supply failure— check rear of unit for fan operation. Check system disk (green LED should flash during power-on). Possible CPU failure. Midplane not seated.
Solid amber LED		CPU board or graphics board failure.
Flashing amber LED	No memory found	SIMM failure. Check error messages for faulty SIMM.
No boot tune	No audio	Faulty speaker. Faulty CPU board. Volume set too low or to zero.
Solid green LED	System menu displayed on booting	Diagnostics successful.
No LED on system disk at any time	No system boot	Drive not all the way into slot—check drive. Drive failure—see your site administrator.
Diagnostic error messages, no login icons	Diagnostic failure No graphics	CPU failure. Graphics board failure. Monitor failure.

When you turn on the power switch, your system should go through these steps:

1. The LED on the front of the machine blinks green, then turns amber, and then the system initiates power-on diagnostics.

2. The system runs power-on diagnostics for about five seconds, then the disks spin up. Each hard disk takes about 15 seconds.

3. When the system passes all power-on tests, the LED turns green.

4. The system boots IRIX or displays a menu, if you configured your system to do so.

If the LED comes on, but there is no image on your monitor, try connecting an ASCII terminal (at 9600 baud) to serial port 1 on the back of your system. On the ASCII terminal you may see error messages that will help you diagnose the problem.

If your system does not operate as described above, you may have a problem. Below is a list of possible symptoms, error messages, and cures to fix your system or locate the faulty part.

No Visible Light From the LED With No Error Message

During power-on, if the system LED doesn't light up and no error message appears on the screen, follow these steps:

1. Disconnect the power cable from the back of the workstation.

2. Remove the top cover from the workstation and make sure the EISA midplane is firmly seated by pressing down on top of it.

   The midplane is the gold-colored metal wall that extends from the fan in the front of the workstation, along the back of the expansion board slots, to the back of the chassis. It's okay to press quite firmly on the top of the midplane wall.

3. Check to make sure the internal power connectors are attached correctly to the system board.

4. Replace the top cover and reattach the power cable to the back of the workstation.

5. Check all cables.

   Make sure the cables are securely connected and the power cable is plugged into an outlet that works.

6. Adjust the brightness control knob on the monitor to test for adequate light on the screen.

7. Make sure you've pressed the power switch to turn on the system.

If all of the cables are connected and the symptoms remain, you may have a faulty power supply.

To see if you have a faulty power supply, follow these steps:

1. Check to see if the fans are running. Feel if there is airflow from the vents and listen for the sound of the fans running.

   One fan is in the front of the workstation on the left. The other fan is in the back of the workstation inside the power supply.

   If the fans are not running, the power supply is faulty or overloaded. Early power supplies may not be adequate for newer configurations.

2. Go to "Removing and Replacing the Indigo2 IMPACT Power Supply" on page 272 to remove the power supply.

3. Follow the instructions in "Ordering Replacement Parts" on page 256 to order a new power supply.

4. Contact your service provider for further instructions.

A Blinking Amber LED With No Error Message

If the LED keeps blinking and no error message appears on the screen, one or more memory SIMMs may be faulty. Go to "Replacing the System" on page 257 to check that all SIMMs are seated all the way into the sockets. Then power on the system again.

If the LED still blinks and the screen is blank, replace all four SIMMs. Follow the instructions in "Ordering Replacement Parts" on page 256 to order new SIMMS and "Checking and Replacing Faulty SIMMs" on page 287 to remove the faulty SIMMs. Then contact your service provider for further instructions.

A Blinking Amber LED With an Error Message

If the LED stays blinking and a message appears on the screen, one or more pieces of hardware may be faulty. Below is a list of messages and instructions on how to respond:

1. If you see this message:

   ```
   No usable memory found. Make sure you have a full bank (4 SIMMs)
   ```

   ■ Go to "Replacing Internal Parts" on page 258 to check that all of your SIMMs are seated all the way into the sockets.

   ■ Power the system on again.

     If you get the same message, the SIMMs are faulty.

   ■ Remove the faulty SIMMs.

   ■ Go to "Ordering Replacement Parts" on page 256 to order replacement SIMMs.

   ■ Contact your service provider for further instructions.

2. If you see this message:

   ```
   Check or replace: SIMM#
   ```

   ■ Follow the instructions in "Replacing Internal Parts" on page 258 to make sure the indicated SIMM is seated all the way into its socket.

     # represents the SIMM number that failed the test (for example, SIMM 1, SIMM 2).

   ■ Power on the system again. If you get the same message, the SIMM is faulty.

   ■ Remove the faulty SIMM.

   ■ Go to "Ordering Replacement Parts" on page 256 to order a replacement SIMM.

   ■ Contact your service provider for further instructions.

3. If you see this message:

   `Memory is not usable. Check or replace all SIMMs.`

   ■ Follow the instructions in "Replacing Internal Parts" on page 258 to check that all of your SIMMs are seated all the way into the sockets and that they are installed in the correct slots.

   ■ Power on the system again.

     If you get the error message, then all SIMMs are faulty.

   ■ Remove the faulty SIMMs.

   ■ Follow the instructions in "Ordering Replacement Parts" on page 256 to order new SIMMs.

   ■ Contact your service provider for further instructions.

A Solid Amber LED With No Error Message

If the amber LED stays on without blinking or turning green, the memory is working but some other part is faulty.

1. If you hear a dissonant piano chord sound from the speaker, the graphics board has failed the test. Check to make sure the graphics board is installed properly.

   ■ Follow the instructions in "Replacing Internal Parts" on page 258 to remove the graphics board and then reinstall it.

   ■ Power on the system.

     If no message is displayed on the monitor, the graphics board is faulty.

   ■ Remove the board.

   ■ Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement board.

   ■ Contact your service provider for further instructions.

2. If you do not hear a dissonant piano chord sound from the speaker:

   ■ Make sure the monitor is plugged in and turned on and the brightness control knob on the monitor is turned to provide adequate light to the screen.

   ■ Check to make sure that the system disk is seated all the way in its slot.

   ■ Try powering on again.

     If an error message is still not displayed, the graphics board is faulty.

   ■ Remove the board.

   ■ Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement board.

   ■ Contact your service provider for further instructions.

A Solid Amber LED With an Error Message

If the LED stays amber and a message appears on the screen, one of your parts is faulty. Below is a list of messages and instructions on how to respond.

1. If you see this message:

   `Check or replace: Graphics board.`

   The graphics board has failed. First, make sure the board is seated properly.

   ■ Follow the instructions in "Replacing Internal Parts" on page 258 to remove the graphics board and reinstall it.

   ■ Power on the system.

     If you get the same error message, the graphics board is faulty.

   ■ Remove the board.

   ■ Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement board.

   ■ Contact your service provider for further instructions.

2. If you see this message:

   `Check or replace: CPU module`

   The CPU module has failed. First, make sure the module is seated properly.

   ■ Follow the instructions in "Replacing the System" on page 257 to remove the CPU module and reinstall it.

   ■ Power on the system.

   If you get the same error message, you have a faulty CPU module.

   ■ Remove the module.

   ■ Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement module.

   ■ Contact your service provider for further instructions.

3. If you see this message:

   `Check or replace: CPU baseboard`

   The CPU baseboard has failed.

   ■ Contact your service provider for further instructions.

4. If the screen looks unusual:

   ■ Make sure all of the cables are firmly connected and that the brightness control knob on the monitor is turned to provide adequate light to the screen.

   If the screen has lines through it, measles, or looks unusual, the graphics board is faulty.

   ■ Remove the board. See Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards."

   ■ Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement board.

   ■ Contact your service provider for further instructions.

A Green LED But the Keyboard Doesn't Work

If the keys on the keyboard don't work, the keyboard is failing.

1. Shut down your system and make sure that the keyboard cable is firmly connected to the keyboard (not the mouse) connector.

2. Power on the system again.

    If the keyboard still doesn't work, the keyboard is faulty.

3. Remove the keyboard.

4. Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement keyboard.

5. Contact your service provider for further instructions.

A Green LED But the Mouse Doesn't Work

If the mouse doesn't work, the mouse is failing.

1. Shut down your system and make sure the cable is firmly connected to the mouse (not the keyboard) connector.

2. Power on the system again.

    If the mouse still doesn't work, you have a faulty mouse.

3. Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part.

4. Contact your service provider for further instructions.

Interactive Diagnostic Environment (IDE) Tests

When you power on the system, power-on tests check the system's essential hardware components. Diagnostic tests give you a greater depth of testing capabilities. Depending on your system configuration, diagnostic tests take a minimum of 30 minutes to run. Each hard disk requires an additional 15 to 30 minutes. Different graphics types and expanded memory require more time.

Note: You can stop the tests at any time by pressing the `<Esc>` key.

The system stops the test if it finds any errors and reports any failures on the screen. To run the diagnostic tests, follow these steps:

1. Shut down the system.

   ■ Place the cursor over the word "System" in the Toolchest in the upper left corner of your screen.

   ■ Click the left or right mouse button so that you see the menu.

   ■ Place the cursor over the words "System Shutdown" and click the mouse button.

   After a few seconds you see the notifier shown in Figure 8-1.
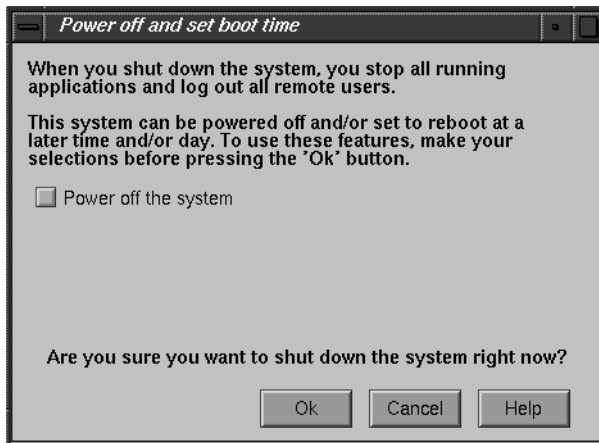
Figure 8-1   System Shutdown Caution Notifier

2. Click *OK*. The screen clears and you see the notifier shown in Figure 8-2.
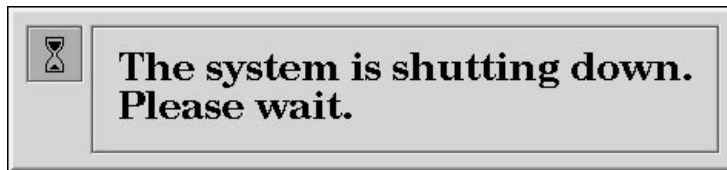
Figure 8-2   System Shutdown Notifier

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3. After a few seconds, the screen clears. When you see the notifier shown in Figure 8-3, click the *Restart* button.

i **Okay to power off the system now. Press any key to restart.**

Restart
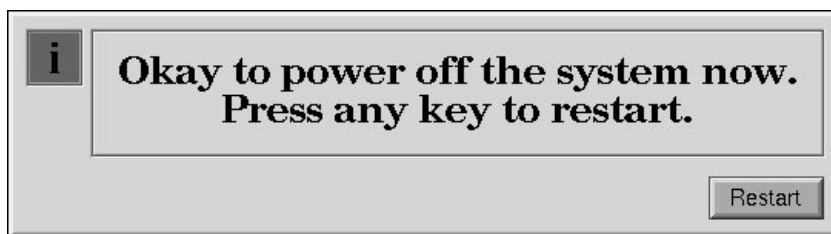
Figure 8-3   Okay to Power Off Notifier

Note: If the system is malfunctioning and you cannot communicate with it using the mouse, keyboard, or over the network, then press the **Reset** button located behind the front cover on the front of the Indigo^2 IMPACT chassis, as shown in Figure 8-4.
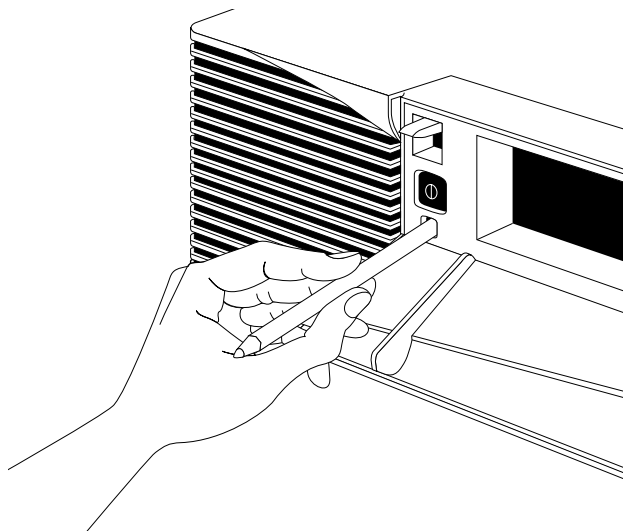
Figure 8-4   Pressing the Reset Button

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4. When you see the notifier shown in Figure 8-5, click *Stop for Maintenance*, or press
   <Esc>.

   If you cannot reach this menu, your system is faulty. Contact your service
   organization.
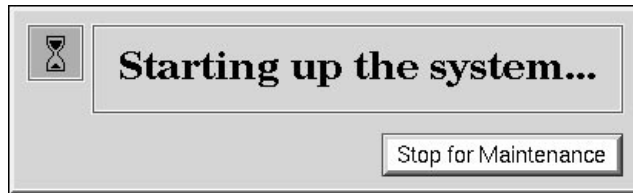
Figure 8-5   Starting Up the System Notifier

The System Maintenance menu appears.

5. Start diagnostics by clicking the *Run Diagnostics* icon or by typing

   3

6. You see a message similar to this:

   ```
   SGI Version 5.3 IP22 IDE field

   October 22 1994

   +
   ```

   Note: If you do not see this message, you cannot run the diagnostics. You may have
   a faulty disk. Contact your service organization.

   The character on the last line (next to the cursor) shows a spinning combination of
   slashes and dashes while the tests are running. Also, the LED on the front of the
   main unit blinks slowly throughout the testing process.

   Included in the diagnostics is a series of graphics tests. During these tests, the screen
   goes blank and displays various images.

7. Watch for messages.

   If the system's hardware is completely healthy, after 10 to 30 minutes (could be more if you have more than one hard disk) you'll see this message:

   ```
   Diagnostic tests completed with no failures detected.

   Press <Enter> to continue.
   ```

   ■   Press **<Enter>** and then **<Esc>** to return to the System Maintenance menu, where you can restart the system by selecting 1. If problems persist, or if you still cannot restart the system, you may have a software problem. See "Recovering From a System Crash" on page 245.

   If the diagnostics find a problem, you see a message like this:

   ```
   ERROR: Failure detected on the CPU module
   ```

   or a message indicating a failure with the CPU baseboard, audio board, or graphics board.

   ■   This means the part indicated has failed. Record this information.

   You may also see other messages that report faulty peripherals or subsystems. If an error message is displayed, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part. Then follow the instructions to remove the faulty part and contact your service provider for further instructions.

Confidence Tests

If your keyboard, mouse, monitor, audio subsystem, or one of the SCSI peripherals (excluding hard disks) isn't working properly, use the confidence tests to verify that each device is working. Your system must be booted and running the IRIX operating system to run these tests.

To run the confidence tests, choose "Run Confidence Tests" from the System toolchest. You see the Confidence Tests form shown in Figure 8-6, with icons for each device for which a confidence test exists. Instructions on how to run each test are given in the sections below.

Figure 8-6   Confidence Tests Form

If you run the confidence tests and find that one of the devices is faulty, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part. Then contact your service provider for further instructions.

Audio Confidence Test

If you are running an audio application and you do not hear the audio output, first make sure all cables are connected properly. Then use the confidence test to make sure the audio is functioning properly.

To test audio, follow these steps:

1. From the System toolchest, choose "Run Confidence Tests." You see the Confidence Tests form, as shown in Figure 8-6.

2. Select the Audio icon and click *Open* or double-click the icon.

3. Click the *Start Test* button.

    You see the form shown in Figure 8-7. The Audio Control Panel is also displayed.
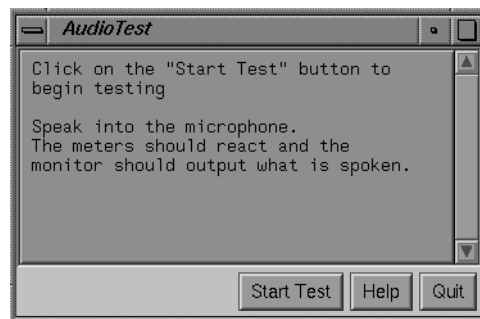
Figure 8-7   Audio Confidence Test Form

4. Follow the instructions on the form.

5. If your audio is still not responding, you may have a bad audio system. If this is the case, you must replace the CPU board. Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part.

6. Contact your service provider for further instructions.

Dial and Button, Tablet, Genlock, and Spaceball Confidence Tests

You'll find instructions on how to run the confidence test for the dial and button box, digitizer tablet, Genlock, and Spaceball options in the installation booklet that comes with each option.

CD-ROM Drive Confidence Test

Before you run a confidence test on a CD-ROM drive, make sure it is correctly installed in your system. "Installing External SCSI Devices" on page 187 tells you how to install a CD-ROM drive. If you suspect that there is a problem with the drive, remove it and then reinstall it. If you still have problems, run the CD-ROM drive confidence test.

To run a CD-ROM drive confidence test, follow these steps:

1. From the System toolchest, choose "Run Confidence Tests." You see the Confidence Tests form, as shown in Figure 8-6.

2. Select the CD-ROM icon and click *Open* or double-click the icon.

    You see the CD-ROM drive confidence test form.

3. Start the CD-ROM drive test.

    ■   When you test the CD-ROM drive, load a CD into the drive.

    ■   Double-click the CD-ROM icon to start the test. You see the CD-ROM drive test in progress.

    When the test is complete, you see the CD-ROM drive test completion notifier.

4. Click *Continue* to dismiss the notifier.

If the drive doesn't pass the test, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part. Then contact your service provider for further instructions.

Floppy or Floptical Drive Confidence Test

Before you run a confidence test on a floppy or floptical drive, make sure it is correctly installed in your system. "Installing an Internal Drive" on page 179 tells you how to install a floppy or floptical drive. If you suspect that there is a problem with the floppy or floptical drive, first remove it and then reinstall it. If you still have problems, run the floppy drive confidence test.

To run a floppy drive confidence test, follow the steps below:

Caution: When you test the floppy or floptical drive, use a floppy that is blank or doesn't have information that you need to keep. The drive destroys any information on the floppy in the process of testing the hardware.

1.   From the System toolchest, choose "Run Confidence Tests." You see the Confidence Tests form, shown in Figure 8-6.

2.   Select the Floppy icon and click *Open* or double-click the icon.

3.   Select the icon that represents your floppy or floptical drive and click *Open* or doubl*e-click* the icon.

4.   Select the density of the floppy you are using.

5.   Insert the floppy into the floppy or floptical drive and click *Test*.

     When the test is complete, you see the floppy drive test completion notifier.

6.   Click *Continue* to dismiss the notifier.

If the drive doesn't pass the test, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part. Then contact your service provider for further instructions.

Keyboard Confidence Test

The keyboard confidence test is useful if the keyboard is not responding to input. Before you run the confidence test on the keyboard, make sure that the cable that connects the keyboard to the system is firmly connected. Once you're sure the connection is good, use the confidence test to make sure that the keyboard is working correctly.

To test the keyboard, follow these steps:

1. From the System toolchest, choose "Run Confidence Tests." You see the Confidence Tests form, as shown in Figure 8-6.

2. Select the Keyboard icon and click *Open* or double-click the icon.

    You see the form shown in Figure 8-8.
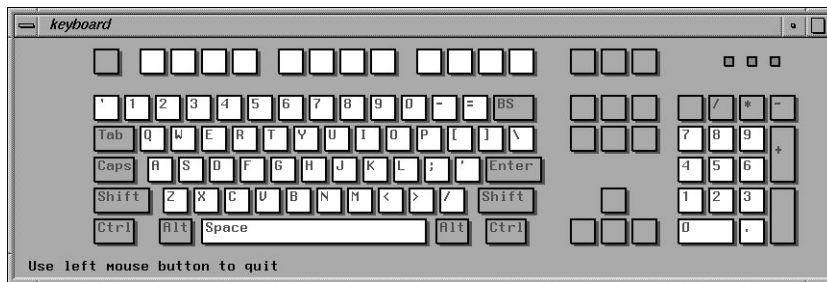
Figure 8-8   Keyboard Test

3. To use the test, press the different keys on the keyboard. The picture on the screen should highlight the key that you press.

    If the graphic doesn't reflect the key that you press, you may have a problem with the keyboard or with the cable that connects the keyboard to the system.

    If you're using a keyboard other than the one supplied by Silicon Graphics, the key layout may be different.

4. Close the keyboard test by clicking the button in the upper left-hand corner of the keyboard graphic and selecting "Quit." The screen goes back to the way it was before you launched the confidence test.

If your keyboard does not work, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part. Then contact your service provider for further instructions.

Monitor Confidence Test

If the monitor isn't working properly or the display is distorted, first check the cable that connects the monitor to the system. Also check to make sure that the brightness knob is providing sufficient light to the screen, that the monitor video cable is firmly connected to both the monitor and the Indigo[2] IMPACT workstation, and that the thumbscrews are screwed in all the way.

If you still have problems, use the confidence test to check that the monitor is working properly. Follow these steps to test the monitor:

1. From the System toolchest, choose "Run Confidence Tests." You see the Confidence Tests form, as shown in Figure 8-6.

2. Select the monitor icon and click *Open*, or double-click the icon.

   The monitor test takes over the entire screen.

3. To run one of the tests from the menu, click the mouse over the menu choice and see how the monitor responds.

4. Click *Quit* when you are finished.

   When you click *Quit,* the screen goes back to the way it was before you launched the confidence test.

If the monitor tests indicate a failure, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement part. Then contact your service provider for further instructions.

Mouse Confidence Test

If the buttons on your mouse do not work, make sure that the mouse cable is firmly connected to the back of the system. If the buttons still don't work, you have a faulty mouse. Follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement mouse. Then contact your service provider for further instructions.

If the mouse is behaving strangely or only one of the mouse buttons works, make sure that the mouse cable is firmly connected to the system. If the buttons still don't work, try running the mouse confidence test.

Follow these steps:

1. From the System toolchest, choose "Run Confidence Tests." You see the Confidence Tests form, as shown in Figure 8-6.

2. Select the mouse icon and click *Open*, or double-click the icon. When you start the mouse test, you see only a mouse on the screen.

3. Test the mouse by moving it around and pressing each button.

    As you press each of the mouse buttons and move the mouse around, the movement is reflected on the screen.

4. If the screen doesn't respond as you move the mouse or press the mouse buttons, the mouse may be faulty. If the mouse does not respond correctly, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement mouse.

5. Press **<Esc>** to quit the mouse test.

    The screen goes back to the way it was when you launched the confidence test. Contact your service provider for further instructions.

Quarter-Inch Tape and Digital Audio Tape Drives Confidence Test

Before you run a confidence test on a tape drive, make sure it is correctly installed on your system. If you suspect that there is a problem with the tape drive, first remove it and install it again. If you still have problems, run the appropriate tape drive confidence test.

To run a tape drive confidence test, follow these steps:

1. From the System toolchest, choose "Run Confidence Tests." You see the Confidence Tests form, as shown in Figure 8-6.

2. Select the tape icon and click *Open* or double-click the icon.

3. Click the icon for the tape drive you have.

4. Insert a blank tape, or one that has information you don't need, into the drive.

    Caution: The tape drive destroys any information on the tape in the process of testing the hardware.

5. Start the tape drive test by double-clicking the tape icon to start the test.

   When the test is complete, you see the tape drive test completion notifier.

6. Click *Continue* to dismiss the notifier.

If the drive doesn't pass the test, follow the instructions in "Ordering Replacement Parts" on page 256 to order a replacement drive. Then contact your service provider for further instructions.

Recovering From a System Crash

If your system crashes because of a software malfunction, you first need to find a CD with the IRIX operating system release that matches the IRIX release you are running on your system. Then you can recover your data from your most recent full backup tape. The backup tape must be one that has been made using the System Manager backup tool, or with the */usr/sbin/Backup* script. You can restore other types of backups, but must do so manually from a shell prompt. (Type sh at any question prompt to get a shell prompt.)

To recover from a system crash, follow these steps:

1. If the system is malfunctioning and you cannot communicate with it using the mouse or keyboard, or over the network, use a pencil or pen to press the **Reset** button located behind the front cover, as shown in Figure 8-9.
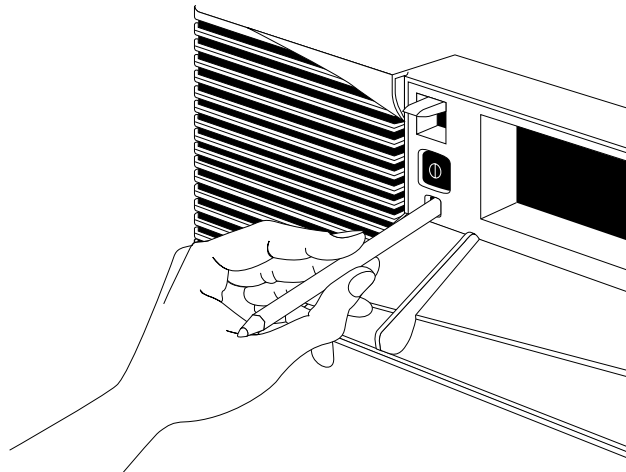
Figure 8-9   Pressing the Reset Button

2. When the system start-up notifier appears, as shown in Figure 8-10, click *Stop for Maintenance* or press **<Esc>** to bring up the System Maintenance menu.
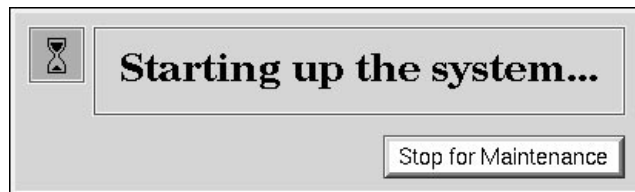
Figure 8-10   System Start-up Notifier

3. Click the Recover System icon in the System Maintenance menu, or enter

   4

   Note: If you are using an ASCII terminal, enter **4** at the System Maintenance menu.

   The System Recovery menu appears, as shown in Figure 8-11.

Figure 8-11   System Recovery Menu

4. Click the appropriate drive icon from which you want to recover the software.

For example, if you have a CD-ROM drive connected to your system, click the *Local CD-ROM* icon. Then click *Accept* to start.

You see the notifier shown in Figure 8-12, prompting you to insert the media into the drive.
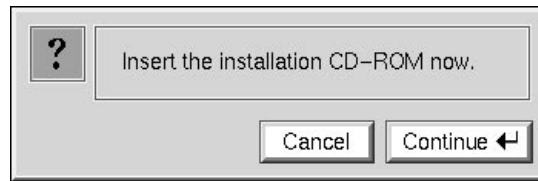
Figure 8-12   Media Request Notifier

If you don't have a CD-ROM drive, you can use a drive that is connected to another system on the network. At the System Recovery menu, click the *Remote Directory* icon. When a notifier appears asking you for the remote hostname, type the system's name, a colon (`:`), and the full pathname of the CD-ROM drive, followed by `/dist`. For example, to access a CD-ROM drive on the system *mars*, you would enter

`mars:/CDROM/dist`

5. Insert the IRIX CD that came with your system, then click *Continue*.

The CD-ROM drive begins reading information from the CD. The system takes approximately 5 minutes to copy the information.

6. After everything is copied from the CD to the system disk, you can restore your data from a recent full backup tape. The backup must be one that has been made using the System Manager backup tool, or with the */usr/sbin/Backup* script.

Note: If you need to check something on your system or do anything special, you can get a shell prompt by entering `sh` at most question prompts.

You see the following message:

```
*********************************************

SYSTEM RECOVERY

*********************************************
```

7. If you have a local tape device, you see this message:

    ```
    Restore will be from <tapename> OK? ([Y]es, [N]o): [Y]
    ```

    <tapename> is the name of the local tape device.

8. If you have a remote (network) tape device, when no tape device is found, or when you answered "No" to the question in the previous bullet, you see this message:

    ```
    Remote or local restore ([r]emote, [l]ocal):
    ```

    ■ If you answer "remote," you have chosen to restore from the network, and you are then asked to enter the following information:

    ```
    - the hostname of the remote system

    - the name of the tape device on the remote system

    - the IP address of the remote system

    - the IP address of your system
    ```

    The IP address must consist of two to four numbers, separated by periods, such as 192.0.2.1.

    ■ If you answer "local," you have chosen a tape device that is connected to your system, and you are then asked to enter the name of the tape device.

9. When you see the following message, remove the CD-ROM, insert your most recent full backup tape, then press **<Enter>**.

    ```
    Insert the first backup tape in the drive, then press <Enter>,
    [q]uit (from recovery), [r]estart:
    ```

10. There is a pause while the program retrieves several files from the tape describing the system state at the time the backup was made. Then you see this message:

    ```
    Erase /x filesystem and make new one (y,n)? [n]
    ```

    x is the filesystem. It prompts you for every filesystem that was known at the time of the backup.

Answer by typing either **y** or **n**.

- If you answer no to this question, the system tries to salvage as many files as possible, then uses your backup tape to replace the files it could not salvage. Usually you should answer **n** for no, especially if your backup tape is not very recent. If the filesystems were badly damaged, or the backup was from a different level operating system, you may need to answer yes.

- If you answer **y** for yes, the system erases the filesystem and copies everything from your backup tape to the disk. The system loses any information on that filesystem that you created between now and when you made your backup tape.

11. You see this message:

```
Starting recovery from tape.
```

After two or three minutes, the names of the files that the system is copying to the disk start scrolling. When the recovery is complete, you see this message:

```
Recovery complete, restarting system.
```

The system restarts.

When you see the login screen, the system is ready to go.

Note: If your backup tapes were old, or you were changing your operating system level, you should reinstall the operating system from the IRIX CD that came with your system after system recovery is complete. When you see the "Starting up the system" notifier, press <Esc>, or click on *Stop for Maintenance*. Then click the *Install System Software* icon. For more information on installing the operating system, go to Chapter 6, "Installing and Removing Peripherals: Internal and External Devices."

Disabling the System Maintenance Password

If you are in the System Maintenance menu, and you choose the Install System Software, Run Diagnostics, Recover System, or Enter Command Monitor icon, you may be prompted for a password, as shown in Figure 8-13.

Figure 8-13   Enter Password Prompt

If you do not know the password, you can disable it by removing a jumper from the inside of the workstation.

Note: If you are able to boot your system and are running IRIX, you can log in as root, and disable the password by entering **/etc/nvram passwd_key ""** at the shell prompt.

To remove the jumper and disable the password, follow these steps:

1. Shut down the system.

    ■ Press and release the power switch to shut down the software and power off the system.

    ■ Press and release the power switch on your monitor to turn it off.

    ■ Disconnect the power cable from the back of the workstation.

2. Remove the cover.

3. Remove the 5-1/4" drive tray.

The jumper is located on the front and center edge of the CPU baseboard, as shown in Figure 8-14.

Jumper pins
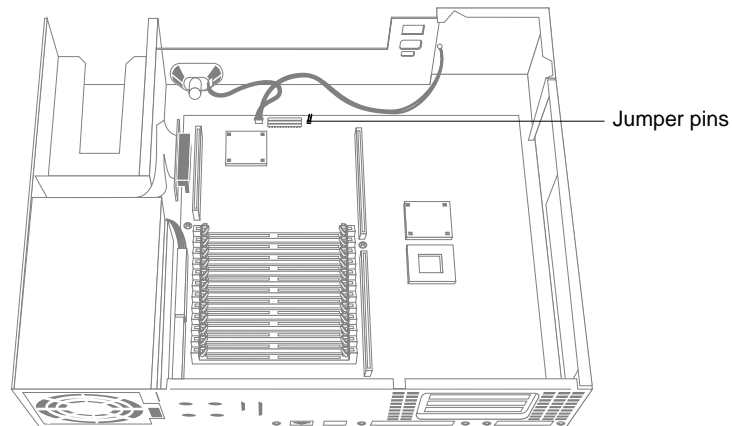
Figure 8-14   Locating the Password Jumper

4. Remove the jumper and save it. You must reinstall it if you choose to reset the password.

5. Replace the 5-1/4" drive tray.

6. Replace the cover.

7. Reconnect the power cable to the back of the workstation.

When you return to the System Maintenance menu and choose one of the four icons mentioned before, you see the notifier shown in Figure 8-15.

Warning: Password jumper has been removed. Not enforcing PROM password.

Continue ↵
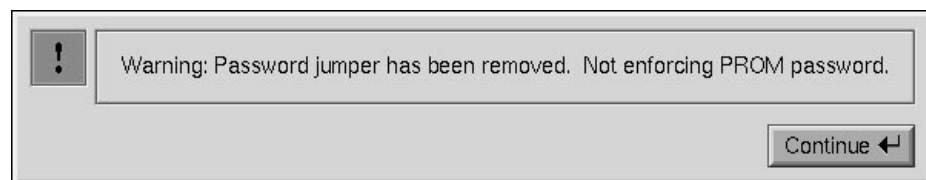
Figure 8-15   Disabled Password Notifier

If you want to re-enable the password, you can do so by entering the command monitor and giving the command *resetpw* to clear the password. Then power the system off, remove the top cover, and replace the jumper. Replace the top cover and power on the system.

SCSI Device Is Turned Off

Occasionally a SCSI device, such as a DAT drive or CD-ROM drive, is turned off after it is installed.

Follow these steps to turn on the SCSI device.

1. Shut down and power off your workstation. See "Shutting Down and Powering Off Your Indigo2 IMPACT System" on page 38.

2. Turn on the SCSI device by pressing the switch on the SCSI device.

3. Check to see that the SCSI device's LED light is on, indicating that it is working.

4. Turn on your workstation. See Chapter 2, "Turning On the Indigo2 IMPACT Workstation" on page 30.

Service and Support Information

When you purchased your system you may have purchased a support program from either Silicon Graphics 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.

Ordering, Removing, and Installing Replacement Parts

This chapter describes how to remove and replace non-graphics parts in your Indigo^2 IMPACT workstation. It also explains how to return the part or the system to your service provider.

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Ordering, Removing, and Installing Replacement Parts

This system is designed to be user maintainable. If diagnostic tests identify a faulty part, contact your service organization before removing the faulty part. In some cases you may be instructed to return the workstation.

For information on replacing graphics boards and identifying and removing attached option boards, go to Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards."

This chapter tells you how to

- order a replacement part and package the faulty part for return
- replace the system
- replace and identify the following internal parts:
    - PROM chip
    - CPU module
    - power supply
    - single inline memory modules (SIMMs)
    - internal drives
- replace the following external parts:
    - keyboard or mouse
    - external SCSI devices

Ordering Replacement Parts

If diagnostics have identified a faulty part, remove it, then follow these steps to order a replacement:

1. Copy the "Part Request Form" directly from the last page of this guide.

2. Note the name of the faulty part on the copy of the form.

3. Note the system serial number of your workstation. The number is on a label on the back of the workstation. See Appendix C for the location of the serial number. You may also, from a shell window, enter `netstat -ia`. Your serial number is the number that begins with 08.

4. Identify the part number of the faulty part. Silicon Graphics part numbers usually are in this format: 000-0000-000. Your service provider can help you with identifying part numbers.

5. Contact your service provider for further instructions.

   Your service provider will ask you for the system serial number, configuration information, the part number of the failed component, and a description of the problem.

6. Pack and ship the faulty part to your service provider if requested.

   For maximum protection to the part, use two sturdy boxes for shipping. Graphics boards, CPU modules, and SIMMs are extremely sensitive to static electricity. Whenever possible, package them in antistatic bags.

   ■ Place the faulty part and "Part Request Form" into one of the two boxes. Pack them in plenty of packing material so the part won't sustain further damage. Tape the box securely.

   ■ Place the box containing the faulty part into a larger box and fill the empty space with packing materials. Tape the box securely and affix a mailing label. Ship the box to your service provider.

Replacing the System

If diagnostics have identified a problem with the system, call your service provider. If instructed to return the system, follow these instructions to prepare it for shipping and complete the necessary paperwork.

1. To preserve your data, remove the disk drives from the system.

    ■ Remove all the floptical or hard disk drives from the 3-1/2" drive slot and the single 5-1/4" drive slot. Go to "Removing and Replacing Internal Drives" on page 289.

    ■ Remove the system disk drive. Go to "Removing and Replacing Internal Drives" on page 289.

2. Remove any optional memory modules or option boards, or other non Silicon Graphics parts installed on the workstation. Refer to the appropriate section in this chapter to remove the parts.

3. Remove any external SCSI devices or external parts and cables such as the keyboard, mouse, camera, or monitor. Do not ship these external parts and cables unless told to do so by your service provider.

4. Make a photocopy of the "Part Request Form" on the last page of this guide.

5. Complete the "Part Request Form." You need to know the serial number of your workstation. The number is on a label on the back of the workstation. See Appendix C for the location of the serial number. The serial number allows your service provider to identify the correct replacement system for you.

6. Pack the workstation in the original packing materials that came with it. The workstation should include all the internal parts (except for the system drive) that it shipped with: power supply, system board, CPU module, graphics board(s), and memory modules.

    Note: It's important that you use the original packing materials to prevent further damage to the workstation and its internal parts. If you don't have the original packing materials, contact your service provider.

7. Ship the workstation to your service provider.

Replacing Internal Parts

Internal customer replacement parts include the graphics board set, EISA and GIO option boards, texture memory option board, CPU module, PROM chip, power supply, internal drives, and SIMMs. External customer replacement parts include the keyboard, mouse and SCSI devices.

See Chapter 3, "Installing and Removing Memory," Chapter 4, "Installing and Removing Standalone Option Boards," and Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards," for help replacing parts not found in this chapter.

To replace an internal part, follow the steps below to shut down the system, remove the cover, attach the wrist strap, replace the part, replace the cover, and start up the system.

Shutting Down the System

To shut down the system, follow these steps:

1. Open the front cover.
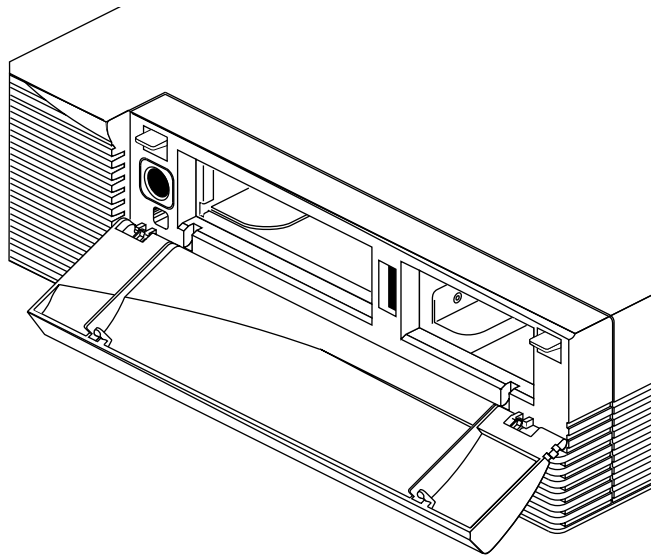
Figure 9-1   Opening the Front Cover

2. Press and release the power switch on the front of the workstation to shut down the software and power off the system.

    The system powers off automatically.
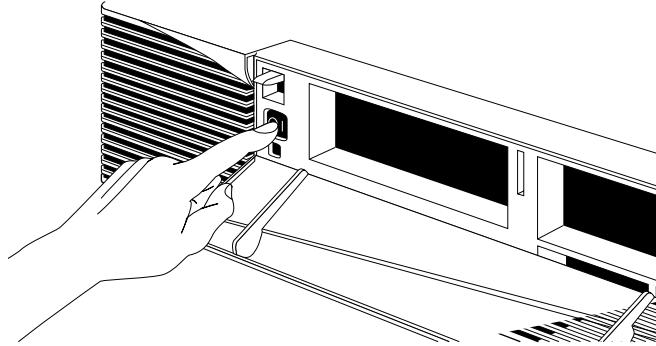
Figure 9-2   Powering Off the System

3. Press the monitor power switch to turn off your monitor.

4. Disconnect any cables from the back of the Indigo^2 IMPACT workstation.

Removing the Cover

Once the system is shut down and all of the cables are disconnected, follow these steps:

1. Remove the lockbar if you have one installed.

    ■   Remove the lock from the lockbar at the back of the workstation.

    ■   Pull the lockbar through the bezel and out.

2. Remove the bezel.

    ■   Press down on the tabs on each side of the bezel, as shown in Figure 9-3.
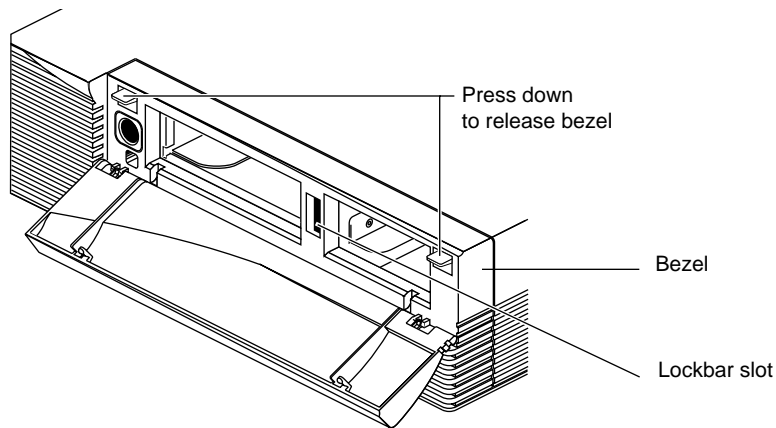
Figure 9-3   Releasing the Bezel

■   Pull the bezel away from the chassis, as shown in Figure 9-4.
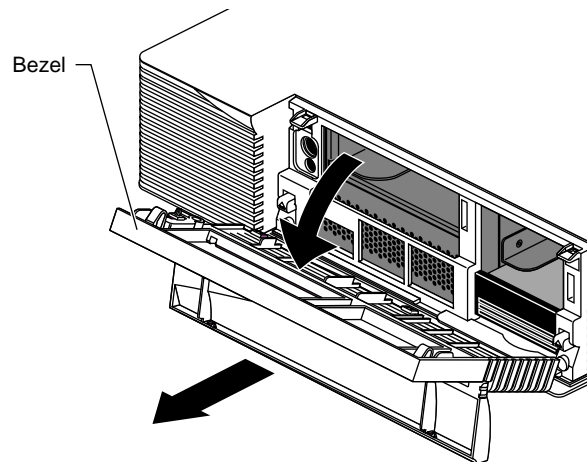
Bezel

Figure 9-4   Removing the Bezel

3. Remove the top cover.

■   Press up on the tabs on each side of the drive openings, as shown in Figure 9-5.

Press tabs
upward here
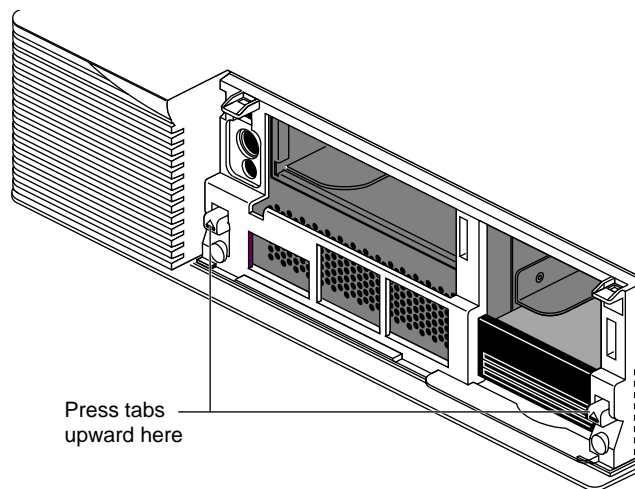
Figure 9-5   Releasing the Top Cover

■   Pull up on the cover and rotate it back and away from the chassis, as shown in Figure 9-6.
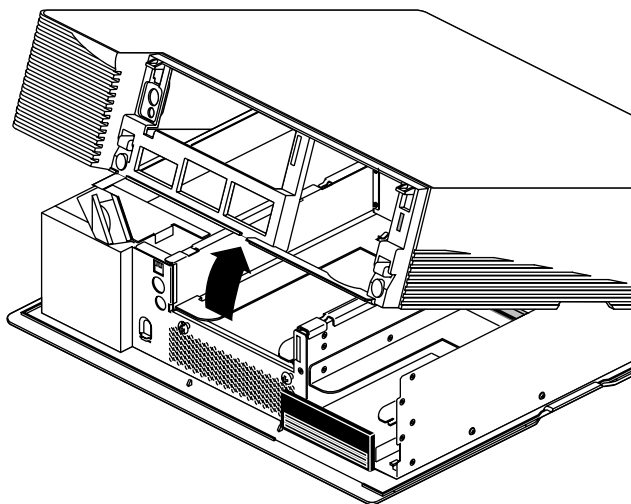
Figure 9-6   Removing the Top Cover

Tip: If the cover is difficult to raise, check the locking levers of your drives to be sure they are fully locked. The levers should be pushed all the way to the right.

Attaching the Wrist Strap

Wear the wrist strap to prevent the flow of static electricity, which can damage the board.

Caution: The components inside the Indigo^2 IMPACT workstation are extremely sensitive to static electricity; you must wear the wrist strap while replacing parts inside the workstation.

To attach the wrist strap, follow these steps:

1. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.

2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

3. Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo^2 IMPACT workstation.

You are now ready to replace the part.

Removing and Replacing the Part

After you've shut down the system, removed the cover, and attached the wrist strap, turn to one of the following sections to learn how to remove and replace the part:

- "Removing and Replacing the PROM Chip" on page 263
- "Removing and Replacing the CPU Module" on page 268
- "Removing and Replacing the Indigo2 IMPACT Power Supply" on page 272
- "Checking and Replacing Faulty SIMMs" on page 287
- "Removing and Replacing Internal Drives" on page 289
- "Replacing the Keyboard or Mouse" on page 292
- "Replacing External SCSI Devices" on page 293

Removing and Replacing the PROM Chip

In some cases, you might be required to remove and replace the PROM chip on the system board. To reach the PROM chip, you must remove any boards connected to the midplane.

Follow the steps below to remove the boards, locate and remove the PROM chip, and install the new PROM chip.

1. If you have not already shut down the system, removed the cover, and attached the wrist strap, go to "Shutting Down the System" on page 258 for instructions.

2. Remove any GIO or EISA boards that are connected to the midplane. If necessary, see Chapter 4, "Installing and Removing Standalone Option Boards," or Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards."

3. Locate the PROM chip. It is located in a socket on the system board on the bottom of the workstation. See Figure 9-7.
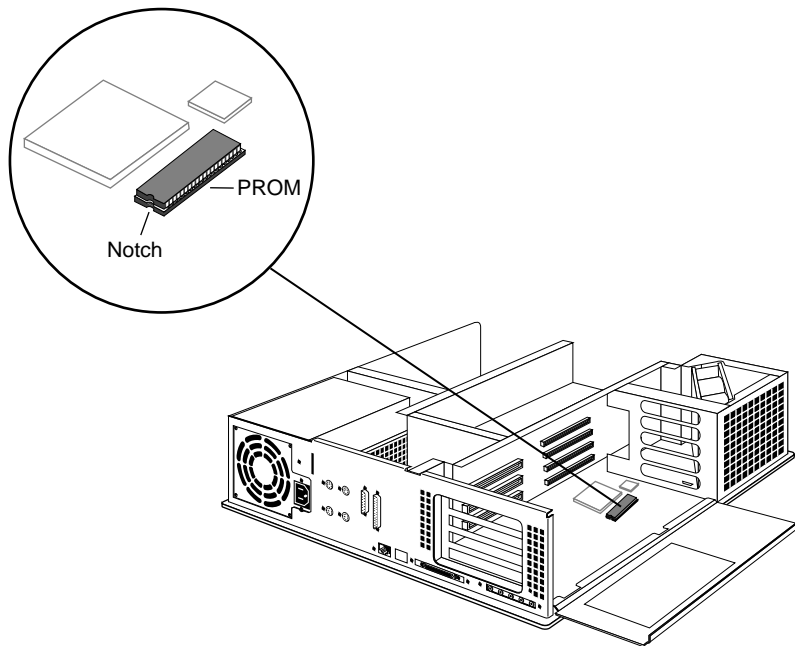
Figure 9-7   Locating the PROM Chip on the System Board

4. Before removing the PROM chip, familiarize yourself with it. Note that it has a semicircular notch at one end, as shown in Figure 9-7. You'll use this notch to orient the new PROM when you install it.

5. Remove the PROM chip from the system board.

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

- Insert the chip removal tool between the PROM chip and the socket on the board, as shown in Figure 9-8. 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.
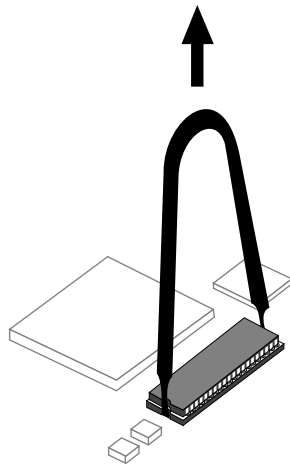
Figure 9-8   Removing the PROM Chip

6. 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 9-9.

    ■   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.
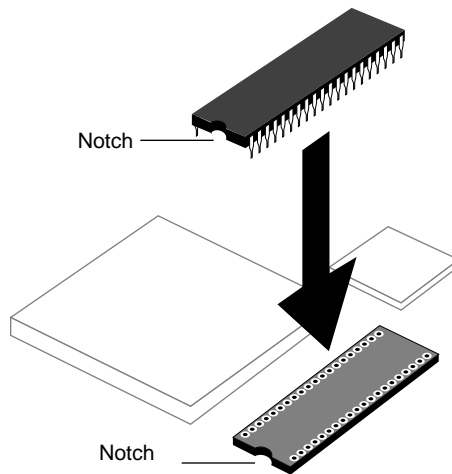
Figure 9-9   Lining Up the PROM Chip

7. 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 9-10.
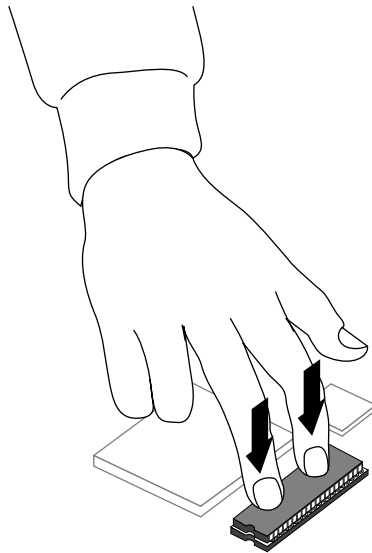
Figure 9-10   Pressing the PROM Chip Into the Socket

8. 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.

9. Replace any EISA boards or GIO boards that you removed, including the High IMPACT graphics board set. Chapter 4, "Installing and Removing Standalone Option Boards," or Chapter 5, "Identifying, Installing, and Removing Graphics Boards and Attached Option Boards.")

10. You have now finished installing the new PROM chip. To replace the top cover, turn to "Replacing the Cover" on page 290.

Removing and Replacing the CPU Module

To replace the CPU module, follow the steps below to remove the 5-1/4" drive tray, remove the CPU module, install the new CPU module, and replace the drive tray.

1. If you have not already shut down the system, removed the cover, and attached the wrist strap, go to "Shutting Down the System" on page 258 for instructions.

2. Remove the 5-1/4" drive tray. If a drive is installed, do not remove the drive from the tray.

   - Disconnect the SCSI cable from the connector on the back of the 5-1/4" drive tray by uncoupling the wire clips from the edges of the connector.

   - Using a Phillips screwdriver, loosen the two captive screws that hold the 5-1/4" drive tray to the chassis. The screws are located below the drive tray on the center front of the chassis.

   - Push the drive tray toward the back of the workstation, and pull up to remove the tray, as shown in Figure 9-11.
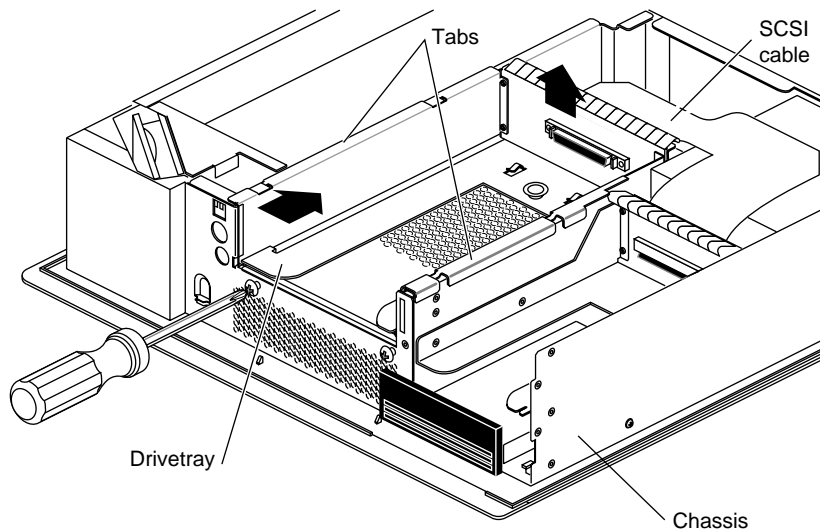
Figure 9-11   Loosening the Screws on the 5-1/4" Drive Tray

3. Locate the CPU module.

    The CPU module is the large elevated module on the CPU board that is protected by a textured heat sink. It contains the CPU chip, cache, and CPU clock crystal.

4. Remove the CPU module, as shown in Figure 9-12.

    ■   Loosen the four captive screws on top of the heat sink.

    ■   Remove the two Phillips screws on the corners of the module that attach the CPU module to the system board.

    ■   Disconnect the module connector from the socket on the system board by lifting up on the edges of the module and gently rocking it back and forth.

    ■   Lift the module up and away from the board.
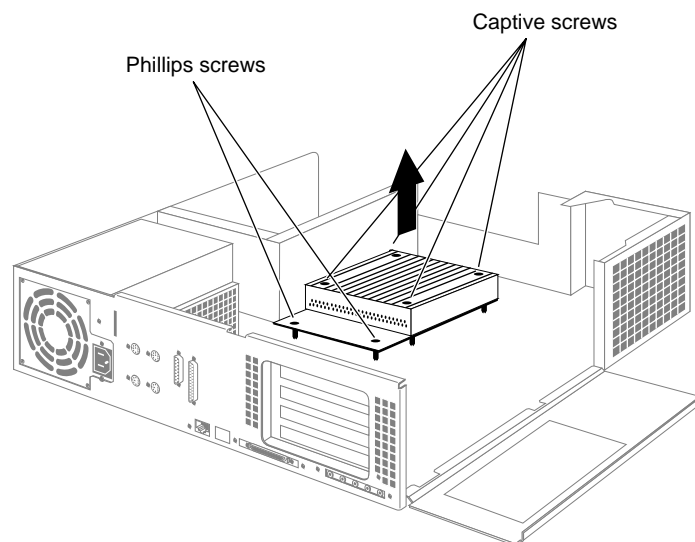
Figure 9-12   Removing the CPU Module

5. Install the new CPU module.

   ■ Position the new module so that the connector on the bottom of the module aligns with the socket on the board.

   ■ Press down on top of the module connector until it is securely attached to the socket on the board.

   ■ Insert and tighten the Phillips screws shown in Figure 9-13 that attach the CPU to the system board.

   Caution: The Phillips screws must be completely tightened for your system to operate properly. Incomplete installation may cause your workstation to operate intermittently or not at all.

   ■ Tighten the captive screws, shown in Figure 9-13.

Phillips screws MUST be fully tightened

Captive screws
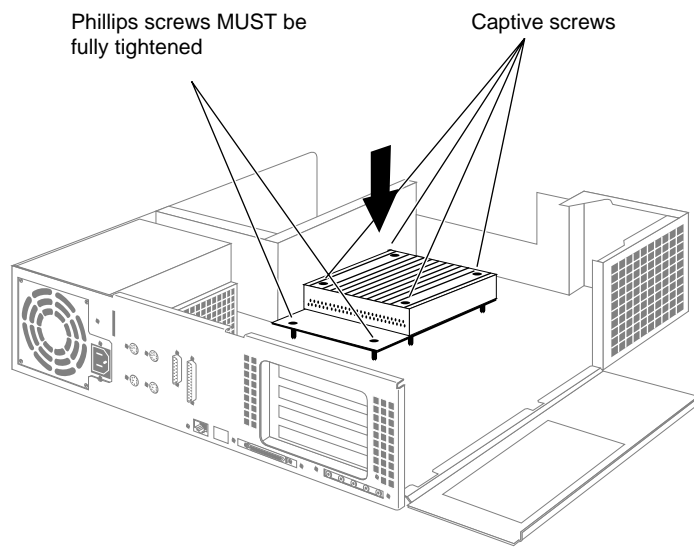
Figure 9-13   Installing New CPU Module

6. Replace the 5-1/4" drive and tray, as shown in Figure 9-14.

   ■ Position the drive tray so that the tabs on the sides of the tray fit inside the slot openings in the chassis and the open side of the tray faces the front of the chassis.
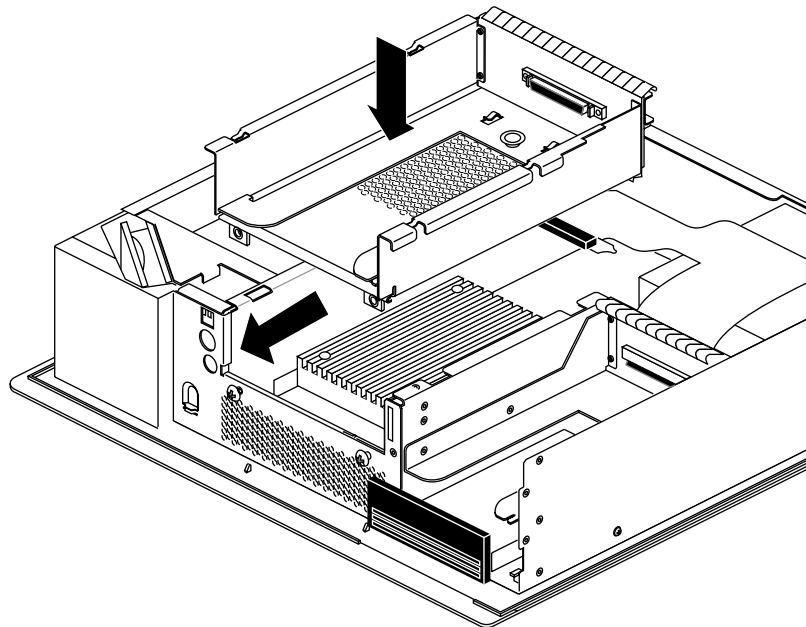
Figure 9-14   Replacing the 5-1/4" Drive Tray

   ■ Pull the tray towards the front of the workstation about 1/2" to lock it in place.

   ■ Tighten the two captive screws.

7. Reattach the SCSI cable to the connector on the back of the drive tray.

   ■ Insert the SCSI cable into the connector on the back of the drive tray.

   ■ Slip the wire clips on the SCSI cable over the edges of the connector.

You are finished replacing the CPU module. To replace the top cover, turn to "Replacing the Cover" on page 290.

Removing and Replacing the Power Supply in an Indigo² IMPACT Ready Workstation

Follow the directions for removing and replacing a power supply in an Indigo² IMPACT workstation, but skip the steps that direct you to connect or disconnect the midplane power cables. In an Indigo² IMPACT Ready workstation, the midplane power cables should remain terminated to the power supply.

Removing and Replacing the Indigo² IMPACT Power Supply

To replace the power supply, follow these steps:

1. If you have not already shut down the system, removed the cover, and attached the wrist strap, go to "Shutting Down the System" on page 258 for instructions.

2. Move the workstation, or position yourself so that you are facing the front of the workstation.

3. Disconnect the SCSI cable from the connector on the back of the 5-1/4" drive tray. See Figure 9-15.

    ■   Slip the wire clips on the SCSI cable off the edges of the connector.

    ■   Grasp the SCSI cable connector and disconnect it from the back of the drivetray. Move the cable with your fingers if you need to reposition it.
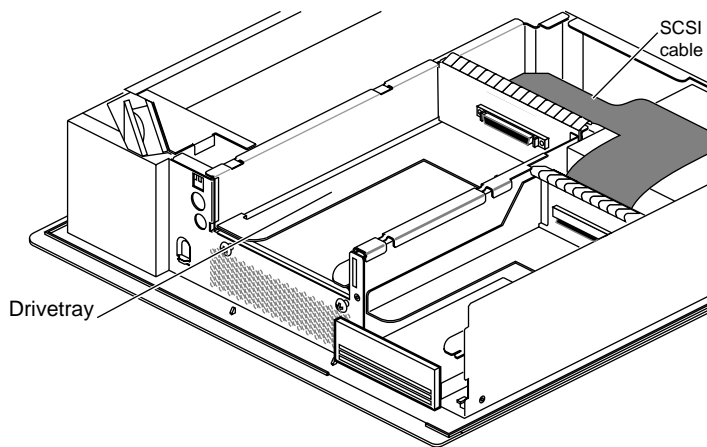
Figure 9-15   Locating the SCSI Cable

4. Remove the 5-1/4" drive tray. Removing the drive tray makes it easier to remove the power supply and install the new one. If there is a drive installed, there is no need to remove the drive from the tray.

■ Loosen the two captive screws that hold the 5-1/4" drive tray to the chassis. The screws are located below the drive tray on the center front of the chassis.

■ Push the drive tray toward the back of the workstation, and pull up on the tabs on the top of the drive tray to remove it, as shown in Figure 9-16.
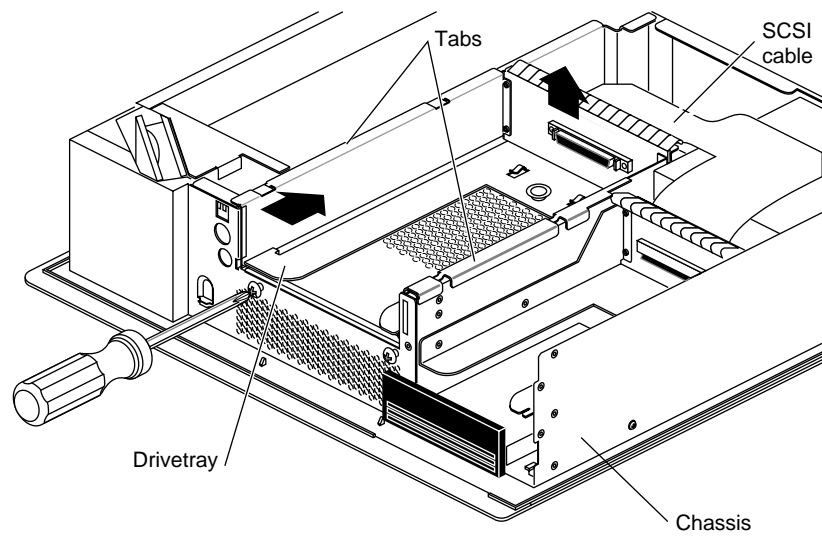
Figure 9-16   Removing the Drive Tray

5. Remove the power supply.

    ■   Move the workstation, or position yourself so that you are facing the back of the workstation. The power supply is located on the left, as shown in Figure 9-17.

    ■   Remove the two screws from the side of the chassis and the two screws from the back of the chassis. The two screws on the back of the chassis are offset. See Figure 9-17.
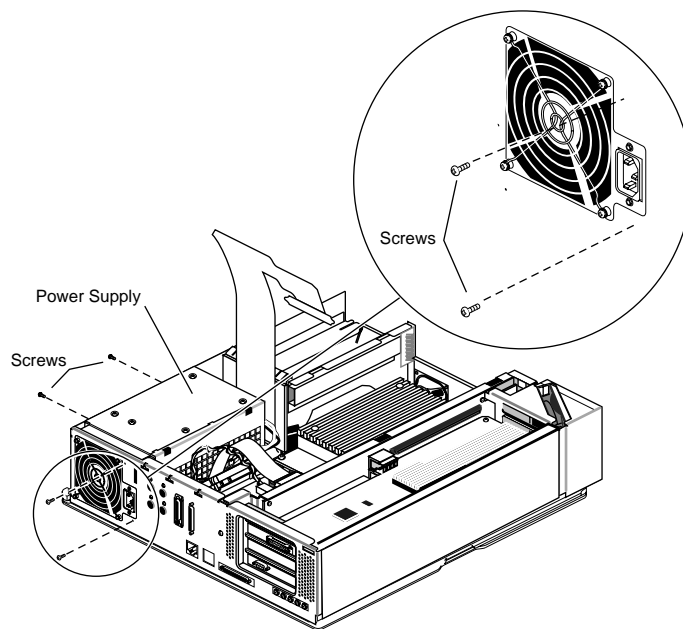
Figure 9-17   Removing the Power Supply Screws

6. Disconnect the power cable to the system drives.

    ■   Disconnect the connector to the disk drives by grasping it and pulling it straight back, away from the disk drives.

    Note: The power supply will be in place when you disconnect the drive cable. Figure 9-18 shows the power supply out of place for illustration purposes.

Power cable to drives
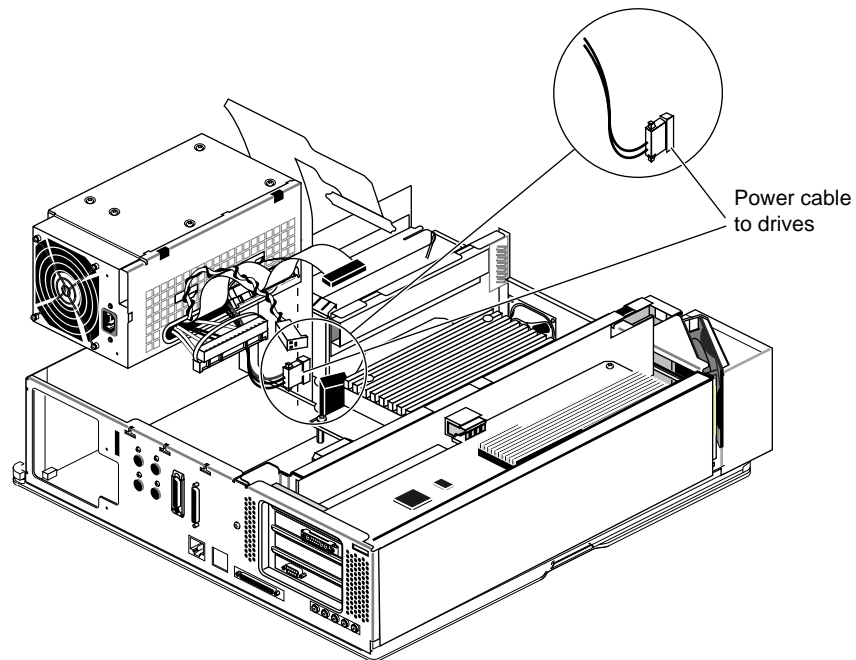
Figure 9-18   Disconnecting the Power Cable to the Drives

7. Disconnect the midplane power cables (ribbon cable and twisted-pair cable) from the midplane, as shown in Figure 9-19.

- Pinch together the corrugated edges on the ribbon cable connector, and disconnect it from the midplane. See Figure 9-19.

- Pull gently on the twisted-pair connector to disconnect it from the midplane.

Note: Skip this step if you have an IMPACT Ready workstation. The midplane power cables in an IMPACT Ready workstation terminate to the power supply and should remain terminated.
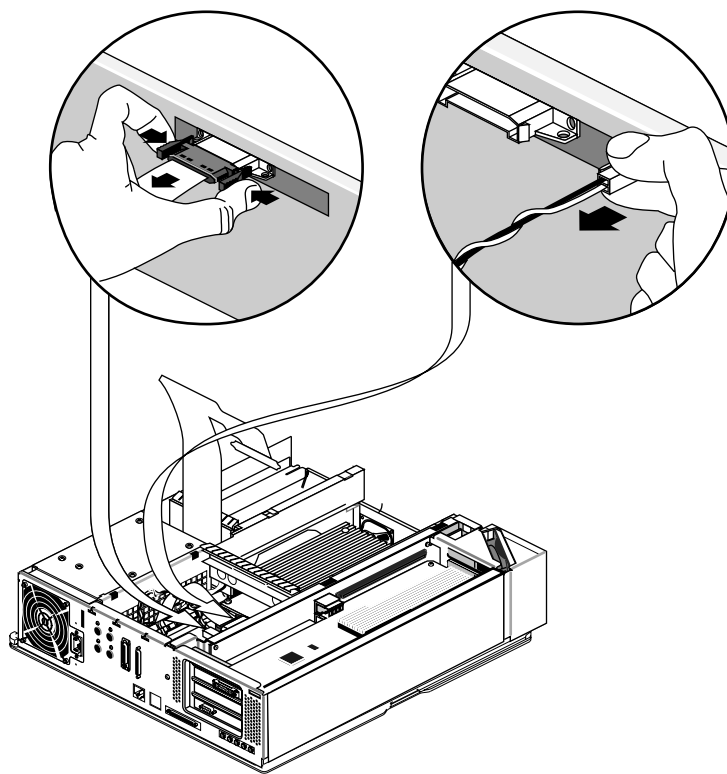
Figure 9-19   Removing the Midplane Power Cables

8. Disconnect the two power cables from the baseboard.

- Disconnect the two cables located on the side of the power supply near the memory banks by grasping the strap on each connector and pulling it straight up.

- Hang each connector by its strap on the two wide hooks that are above the connectors and attached to the side of the power supply. See Figure 9-20.
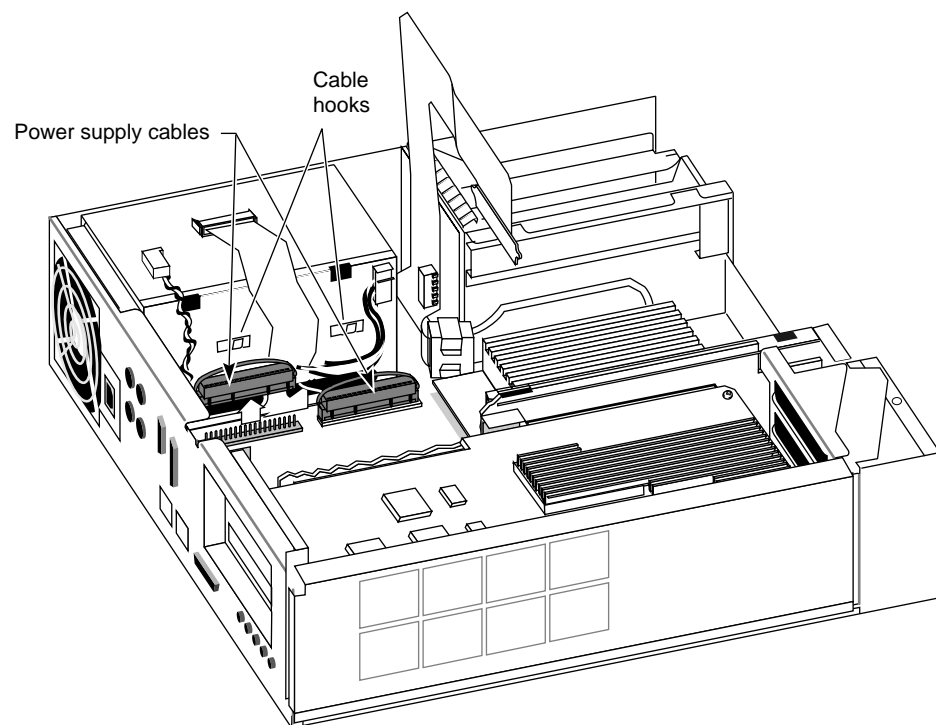
Figure 9-20   Removing the Baseboard Power Cables

Caution: Do not bump the SIMMs located adjacent to the baseboard power cables. The SIMMs can become loose if bumped.

9. Remove the power supply.

■ Move the power supply toward the front of the workstation about 1/4", as shown in Figure 9-21, by pushing on the flat surfaces around the fan.
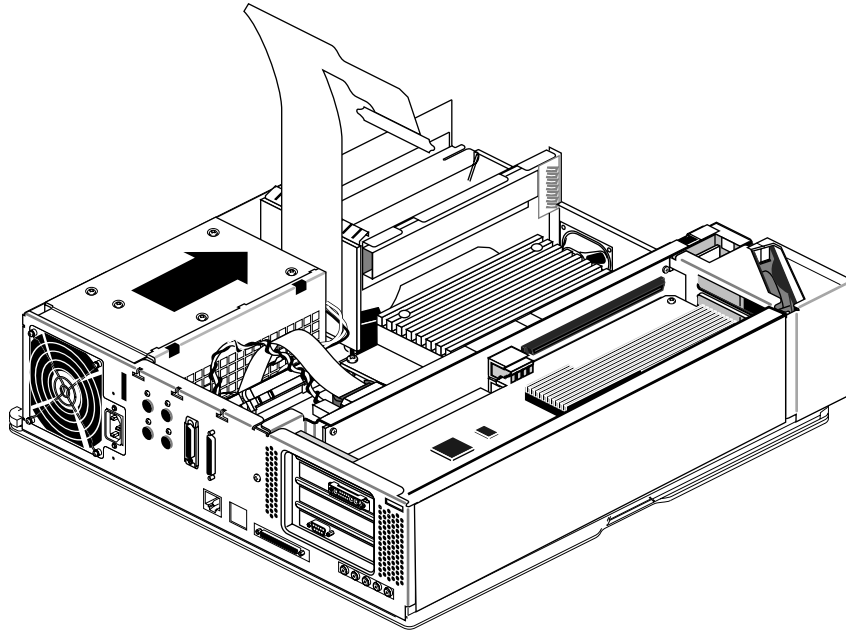
Figure 9-21 Sliding the Power Supply Forward

■ Lift the power supply up and out of the chassis, as shown in Figure 9-22.
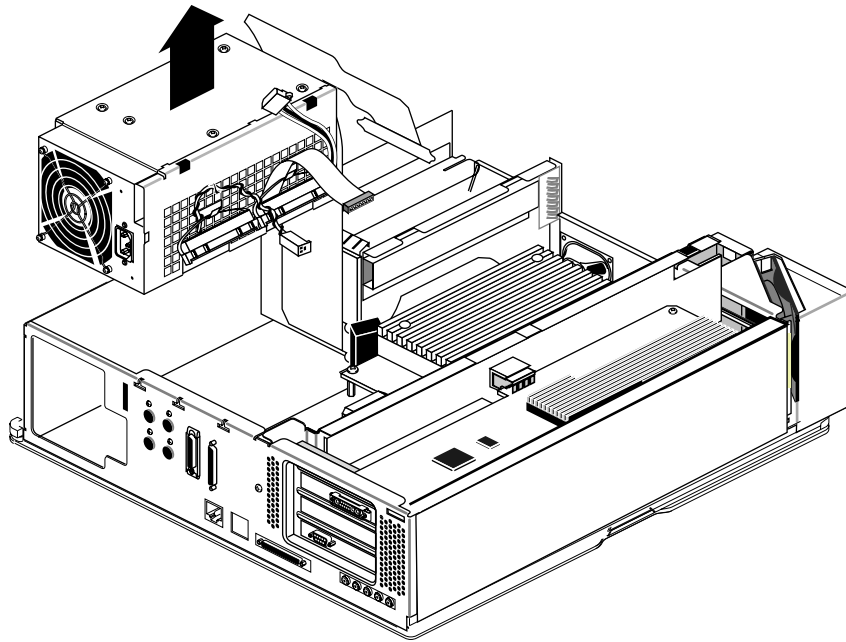
Figure 9-22   Lifting the Power Supply From the Chassis

To replace the power supply, follow these steps.

1. The new power supply has two midplane power supply cables terminated to the side of the power supply, a ribbon cable and a twisted-pair cable.

   ■ Pinch together the corrugated edges on the ribbon cable connector, and disconnect it from the terminating bracket. See Figure 9-23.

   ■ Pull gently on the twisted-pair connector to disconnect it from the terminating bracket.

Midplane cable bracket

Midplane power supply cables
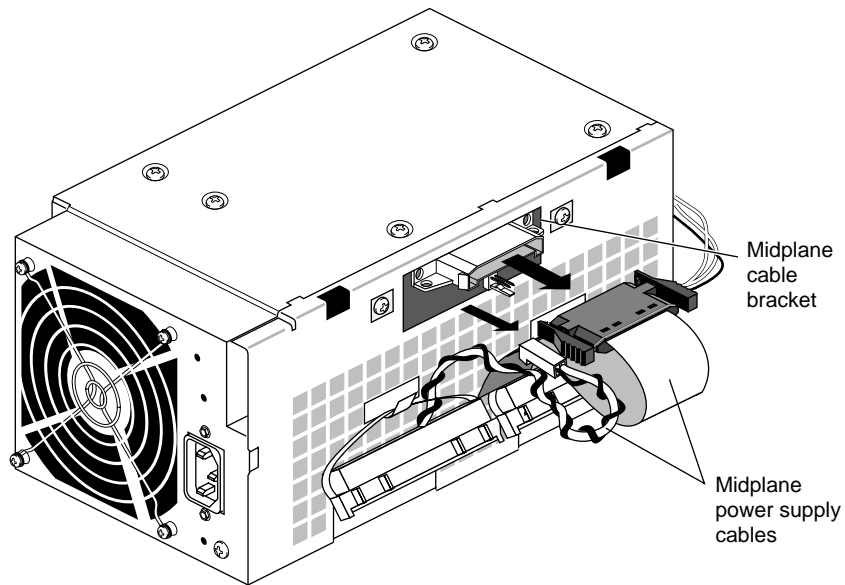
Figure 9-23   Disconnecting the Terminated Midplane Power Supply Cables

2. Before installing the new power supply, connect the power cable located close to the disk drives.

    ■   Hold the power supply with one hand so that the fan faces the back of the chassis and the power connectors are on the bottom. With your other hand, connect the free end of the power cable (shown in Figure 9-24) to the connector located close to the disk drives.

        The connector is keyed so that you can connect it only one way if you don't force it.

    ■   Press the connector firmly until seated. Check that it is seated all the way in the socket.
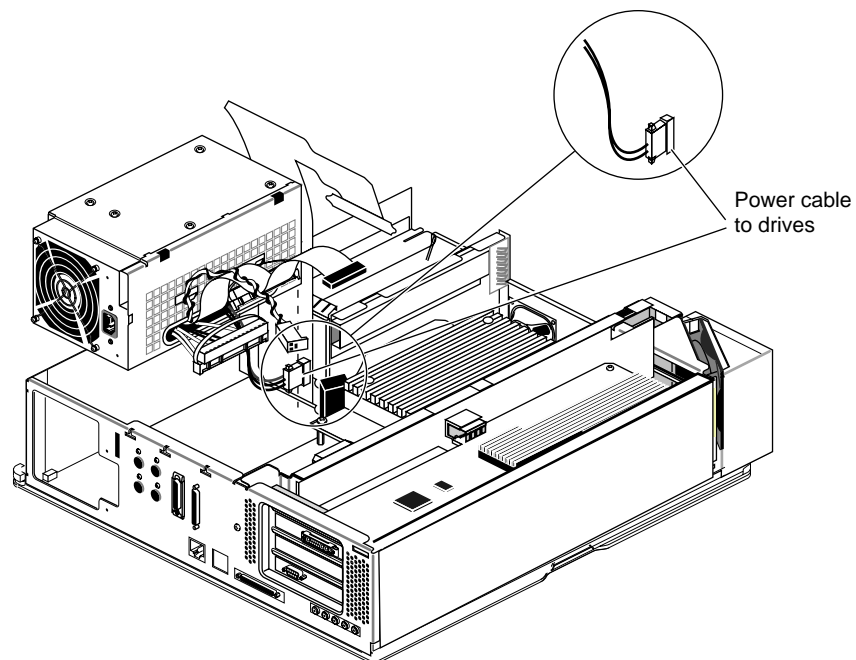
Figure 9-24   Connecting the Power Cable to the Drives

3. Install the new power supply, as shown in Figure 9-25.

■ Look at the metal feet on the bottom of the power supply. The metal feet will slide into the holes on the bottom of the chassis.

■ Lower the power supply into the Indigo² IMPACT chassis as close to the disk drives and side of the chassis as possible. Make sure that the power supply is flat against the bottom of the chassis.

■ Shove the power supply toward the back of the Indigo² IMPACT chassis, as far as it will go, making sure the metal feet on the bottom of the power supply engage in the holes on the chassis floor.

If the metal feet do not engage in the holes, raise the power supply and lower it again, making sure it is flat against the bottom of the chassis.
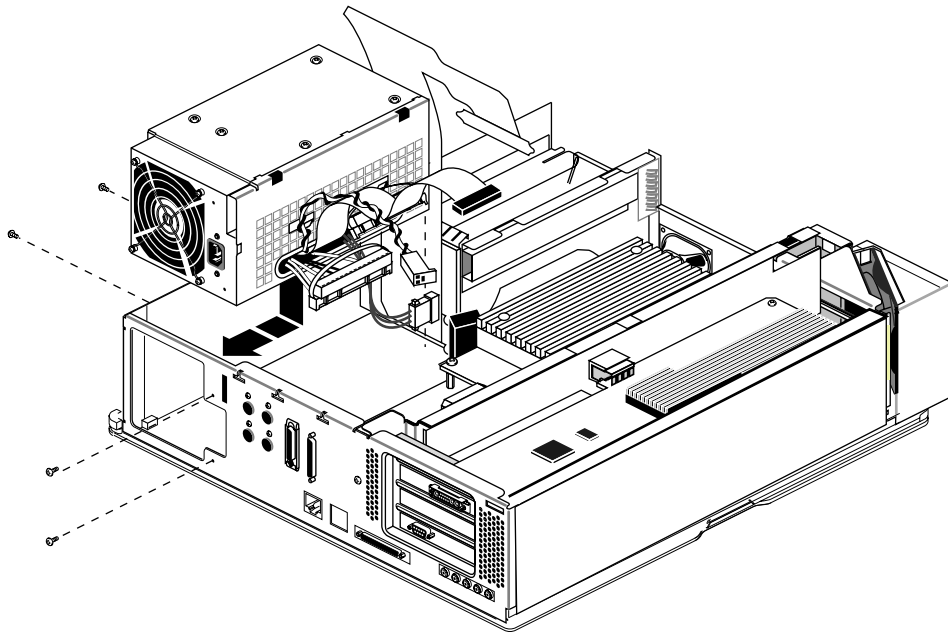
Figure 9-25   Installing the Power Supply

Tip: A good test is to lift up the power supply. If the chassis comes up with it, the metal tabs are engaged

4. Replace the four screws that hold the power supply, as shown in Figure 9-26.

   If the screw holes do not line up, verify that the power supply is seated all the way, and is pushed all the way against the back of the chassis.
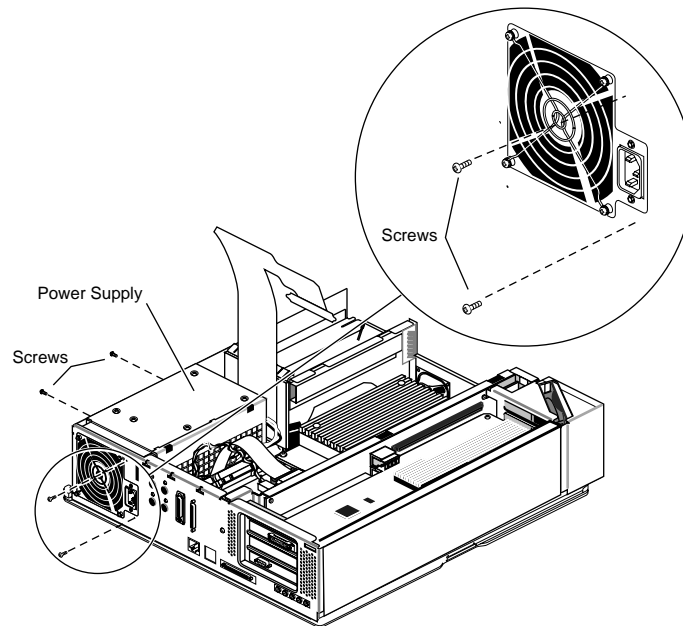
Figure 9-26   Replacing the Screws

5. Connect the two power cables that attach to the baseboard.

    ■   Remove the two power supply connectors (located close to the memory banks) from their hooks on the side of the power supply.

    ■   Connect the two power supply connectors as shown in Figure 9-27. These connectors are not keyed, so make sure you align them correctly before pressing firmly with your thumbs to seat them.

    Caution: The pins the connectors slide onto can easily bend and break. Place the connectors carefully.

    ■   Check that the two power supply connectors are seated all the way in the sockets.
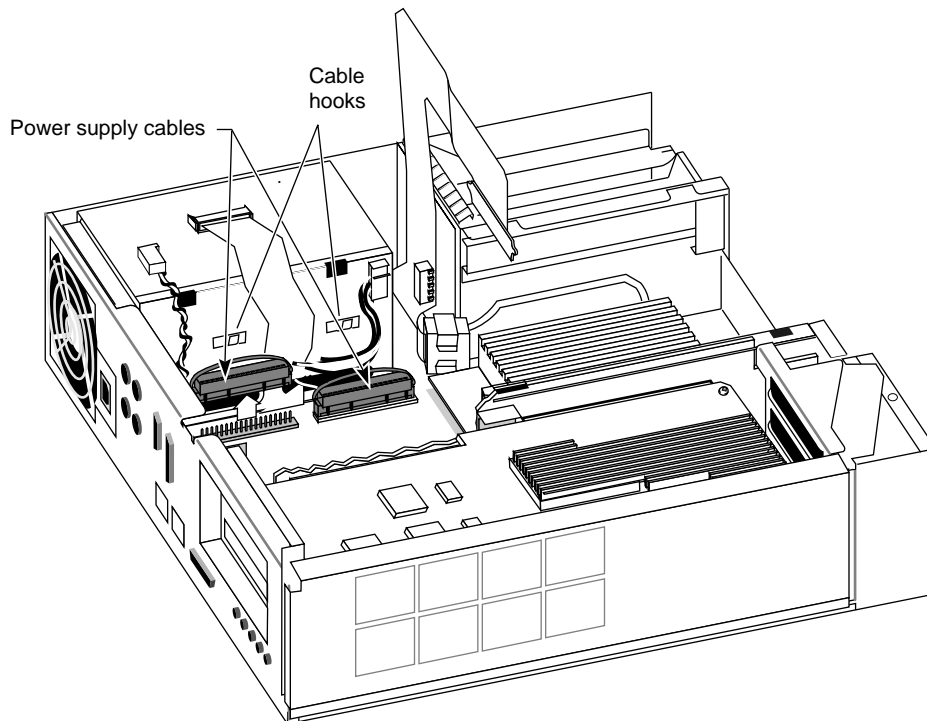
Figure 9-27   Connecting the Power Cables to the Baseboard

6. Connect the midplane power cables (ribbon and twisted-pair) to the gold-colored midplane. (Skip this step if you have an Indigo^2 IMPACT ready workstation. The cables must remain terminated to the power supply.)

   ■ Pinch together the corrugated edges on the ribbon cable connector, and connect it to the midplane. See Figure 9-28.

   ■ Push gently on the twisted-pair connector to connect it to the midplane.
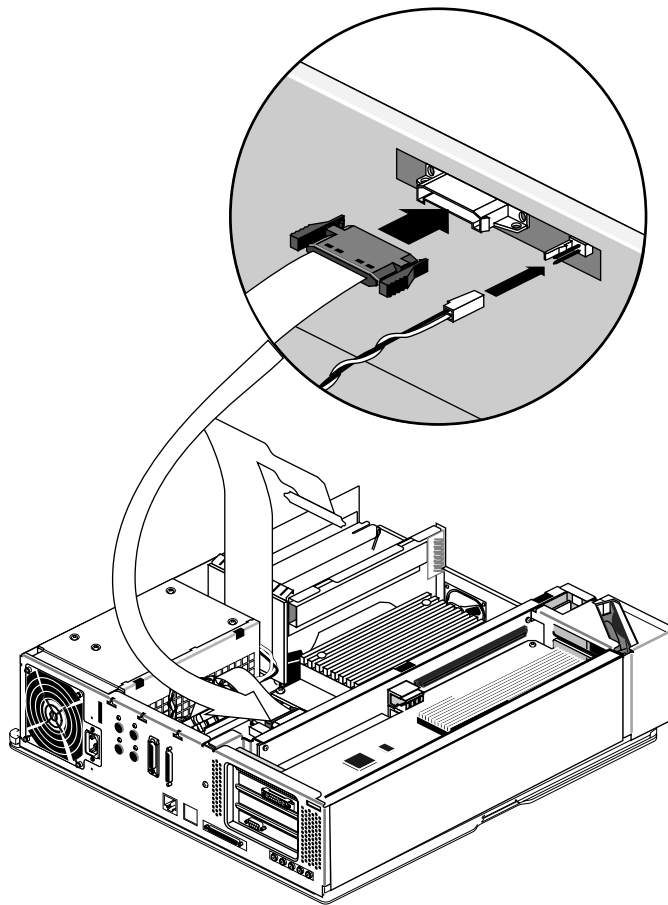
Figure 9-28   Connecting the Midplane Power Cables

7. Move the workstation, or position yourself so that you are facing the front of the workstation.

8. Replace the 5-1/4" drive and tray, as shown in Figure 9-29.

   ■ Position the drive tray so that the tabs on the sides of the tray fit inside the slot openings in the chassis and the open side of the tray faces the front of the chassis.

   ■ Pull the tray toward the front of the workstation about 1/2" to lock it in place.

   ■ Tighten the two captive screws.

9. Reattach the SCSI cable to the connector on the back of the drive tray.

   ■ Push the SCSI cable into the connector on the back of the drive tray.

   ■ Slip the wire clips on the SCSI cable over the edges of the connector.
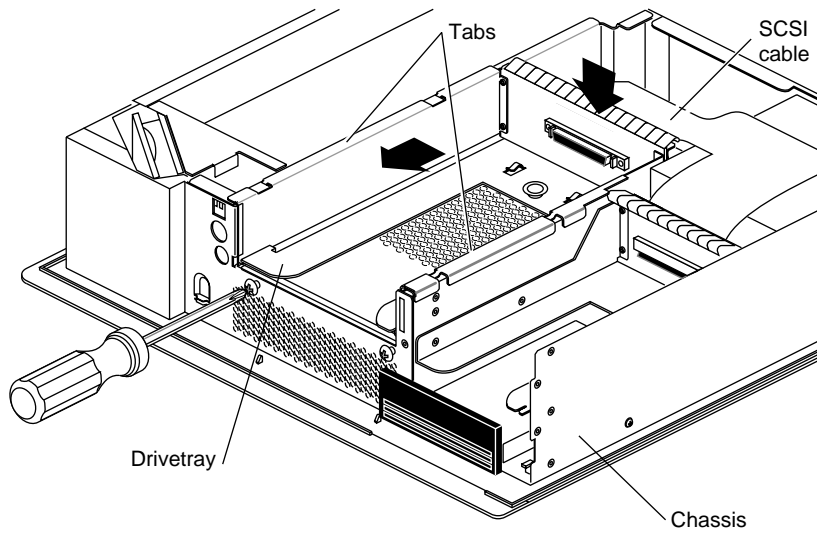
Figure 9-29   Replacing the 5-1/4" Drive Tray

10. Detach the wrist strap from your wrist and the chassis.

You are finished replacing the power supply. Turn to "Replacing the Cover" on page 290 to replace the top cover.

Checking and Replacing Faulty SIMMs

Before replacing SIMMs, check to make sure that all SIMMs are seated correctly in their slots.

1. If you have not already shut down the system, removed the cover, attached the wrist strap, and removed the SCSI cable, power cable, and twisted-pair cable, go to "Shutting Down the System" on page 258 for instructions.

2. Check to see that all the SIMMs are installed correctly.

    ■   A SIMM is installed correctly when it is vertical and perpendicular to the CPU baseboard, and when the latches on the sides of the SIMM fit snugly around it.

    ■   If the SIMM appears to be leaning, push it into a vertical position.

3. Replace the drive tray if you removed it. See Figure 9-30.

   ■ Position the drive tray so that the tabs on the sides of the tray fit inside the slot openings in the chassis and so that the open side of the tray faces the front of the chassis.

   ■ Push the tray forward about 1/2" to lock it in place.

   ■ Reattach the SCSI cable to the connector on the back of the drive tray.

   ■ Push the SCSI cable into the connector on the back of the drive tray.

   ■ Slip the wire clips on the SCSI cable over the edges of the connector.

   ■ Tighten the two captive screws.
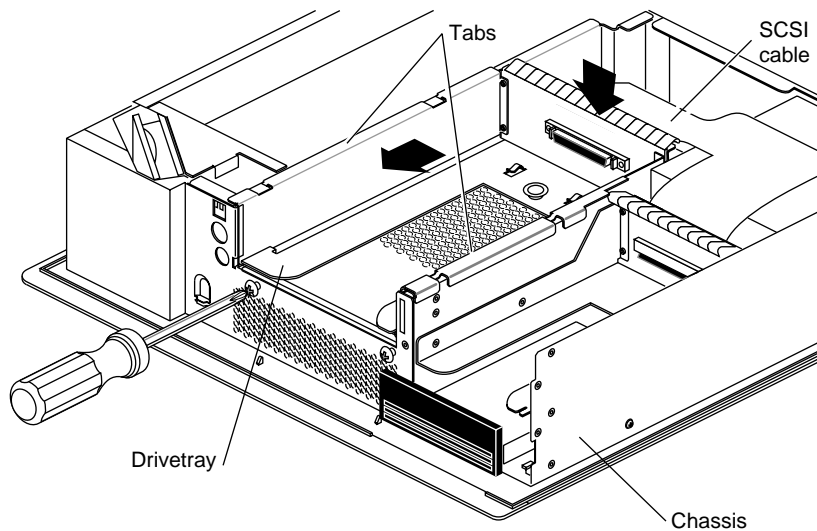
Figure 9-30   Replacing the 5-1/4" Drive Tray

4. Replace the cover and power up the system. See "Replacing the Cover" on page 290 for instructions.

5. If the error message still says

   ```
   Check or replace SIMM#
   ```

   you have a faulty SIMM. Follow the instructions in "Ordering Replacement Parts" on page 256. Then contact your service provider for further instructions.

Removing and Replacing Internal Drives

To replace an internal drive, follow these steps:

1. If you have not already shut down the system, go to "Shutting Down the System" on page 258 for instructions.

2. Remove the drive.

   ■　Locate the lever below the drive.

   ■　Push on the lever and move it all the way to the left. This releases the drive.

   ■　Pull the drive all the way out of the slot.

3. Install the new drive.

   To install the new drive, follow the instructions in "Installing an Internal Drive" on page 179.

Replacing the Cover

To replace the top cover, follow these steps:

1. Locate the tabs on the inside and back of the top cover and the slots on the back of the workstation. See Figure 9-31.

Tabs

Hook
(do not use
the hooks as
guides for
replacing cover)

Slot
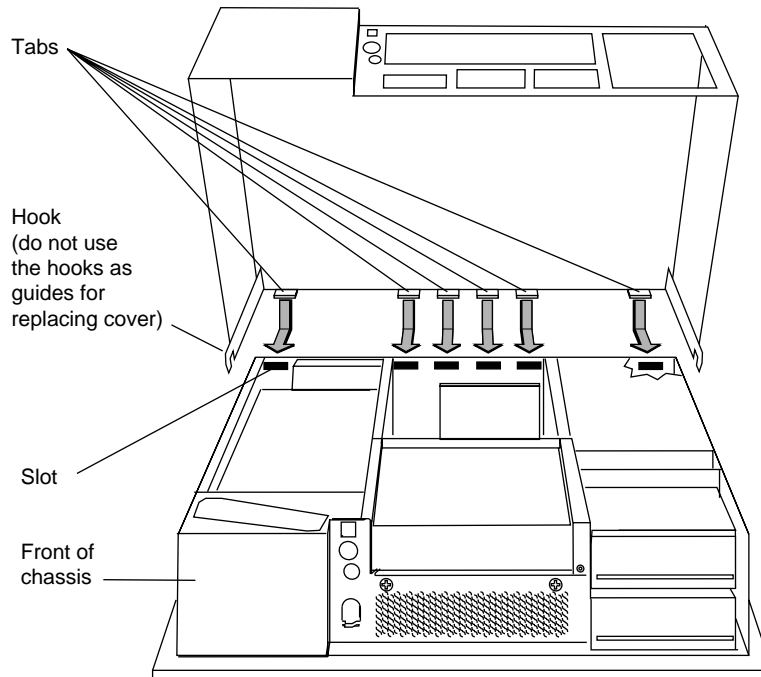
Front of
chassis

Figure 9-31   Replacing the Top Cover

2. Face the front of the workstation.

    ■   Look through the slots as you lower the cover and move the tabs into place.

    ■   Slide the tabs into the slots and pull the cover down until it snaps into place. The cover fits tightly over the workstation.

3. Replace the bezel.

    ■   Place the tabs on the bottom of the bezel into the grooves in the front of the chassis, as shown in Figure 9-32.
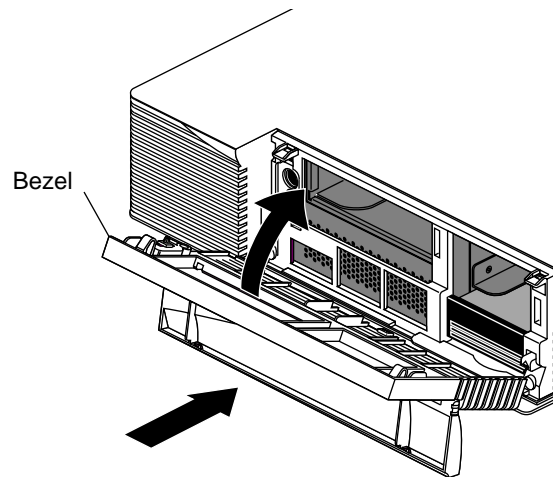
Figure 9-32   Replacing the Bezel

4. Tilt the bezel up until it snaps into place.

5. Reinstall the lockbar if you had one installed.

    ■   Slide it through the bezel and out the back of the workstation.

    ■   Reattach the lock.

6. Close the front panel of the bezel.

7. Reconnect the power cable to its connector on the back of the Indigo^2 IMPACT workstation. If you have removed the monitor cable, reconnect it to the back of your Indigo^2 IMPACT workstation.

You are finished replacing the part and are ready to power on the system.

Removing and Replacing External Parts

External replacement parts include the keyboard, mouse, and external SCSI devices. To replace an external part on the Indigo^2 IMPACT, shut down the system, replace the part, then start up the system.

Shutting Down and Powering Off the System

To shut down and power off the system, follow these steps:

1. Open the front cover.

2. Press and release the power switch on the front of the workstation to shut down the software and power off the system.

    The system powers off automatically.

3. Press the monitor power switch to turn off your monitor.

4. Disconnect the power cable from the back of the Indigo^2 IMPACT workstation.

To replace the keyboard or mouse, see below for instructions. To replace an external SCSI device, turn to "Replacing External SCSI Devices" on page 293.

Replacing the Keyboard or Mouse

To replace the keyboard or mouse, follow these steps:

1. See "Shutting Down and Powering Off the System" on this page to shut down the system.

2. Disconnect the mouse or keyboard cable from its port on the back of the workstation.

3. Connect the new mouse or keyboard cable to the workstation.

4. Reconnect the power cable to the back of the workstation.

5. Press and release the power switch on the monitor. Then press and release the power switch on the front of the workstation to power on the system.

Replacing External SCSI Devices

All SCSI devices should be Silicon Graphics supported or they may not work with your system.

To replace an external SCSI device, follow these steps:

1. Turn to "Shutting Down and Powering Off the System" on page 292 to shut down the system.

2. Disconnect the power cable from the SCSI device.

3. Disconnect the SCSI cable from the back of the Indigo^2 IMPACT chassis.

   ■ Squeeze the clips on both sides of the connector.

   ■ Pull off the connector.

4. If you are not going to install another external device, reattach the terminator (which came with your Indigo^2 IMPACT workstation) on the SCSI port.

   Note: The terminator that shipped with your Indigo^2 IMPACT workstation is a high-density active terminator. The terminator on an external drive may be a low-density terminator. Use only an active high-density terminator to terminate the Indigo^2 IMPACT workstation.

   Gently push the terminator into the SCSI connector on the back of the Indigo^2 IMPACT chassis until the clips snap into place.

   The SCSI connector is designed so that you can put the terminator on only one way, if you do not force it.

5. Reconnect the power cable to the back of the workstation.

6. Press and release the power switch on the monitor. Then press and release the power switch on the front of the workstation to power on the system.

To install a replacement external SCSI device, follow the instructions in "Installing External SCSI Devices" on page 187.

Maintenance, Safety, and Regulatory Information

This chapter provides guidelines for adjusting your work surface and environment to increase your comfort and safety.

This chapter also contains regulatory statements.

Maintenance, Safety, and Regulatory Information

This chapter gives you information on safety and comfort and some helpful hints on maintaining your Indigo[2] IMPACT. It also gives you important regulatory information.

Maintaining Your Hardware and Software

This section gives you some basic guidelines to follow to keep your hardware and the software that runs on it in good working order.

Hardware Do's and Don'ts

To keep your workstation in good running order, follow these guidelines:

Do not

- enclose the workstation in a small, poorly ventilated area (such as a closet), crowd other large objects around it, or drape anything (such as a jacket or blanket) over the workstation

- drape anything, such as a jacket or blanket, over your Indigo[2] IMPACT workstation

- use the workstation as a shelf or a table

- run the workstation with the bezel or top open or off; this alters the air flow

- connect cables (other than audio) or add hardware components while the workstation is turned on

- move the workstation while it is running, or within 1 minute of powering it down; it contains a hard disk that may be damaged

- use an adapter to plug the workstation into a two-pronged (ungrounded) outlet

- place liquids or food on the workstation or keyboard
- lay the workstation on its side without using the workstation stand that shipped with the workstation
- dangle the mouse by its cable or throw the mouse at co-workers

Do

- plug in all cables completely
- plug the workstation into a power surge protection strip (if possible)

Software Do's and Don'ts

When your system is up and running, follow these guidelines:

Do not

- use the root account unless you are performing administrative tasks

Do

- make regular backups (weekly for the whole system, nightly for individual users) of all information
- protect the root account with a password
- protect all open accounts (such as lp, guest, and so on) with a password, if your system is connected to the Internet

Physical Environment Specifications

Table 10-1   Physical Environment Specifications

Item	Specification
Workstation	5" H x 18.5" W x 18.5" D; 40 lbs.
Power	Voltage and frequency: 100-120/200-240 VAC, 50/60 Hz, 8/4 A
Ambient Temperature	+13 to +35 degrees C, operating -10 to +65 degrees C, non-operating
Relative Humidity	10% to 80% operating, no condensation 10% to 95% non-operating, no condensation

Human Factors Guidelines for Setting Up Your Indigo^2 IMPACT Workstation

You can increase the comfort and safety of your work environment, and decrease your chances of cumulative trauma disorders, by following the guidelines given below. These guidelines will help you to create a healthy and productive work environment by showing you how to

- set up your Indigo^2 IMPACT workstation
- use your Indigo^2 IMPACT workstation correctly
- properly choose a site for your system and its components
- set up your desk and chair correctly

Setting Up Your Indigo^2 IMPACT Workstation

To place your Indigo^2 IMPACT workstation on the floor in its workstation stand, follow these steps:

1. Face the front of the workstation.

2. Push the workstation so the left side is hanging off the edge of your work surface.

3. Look at the underside of the workstation. You will see guides for the workstation stand, as shown in Figure 10-1.
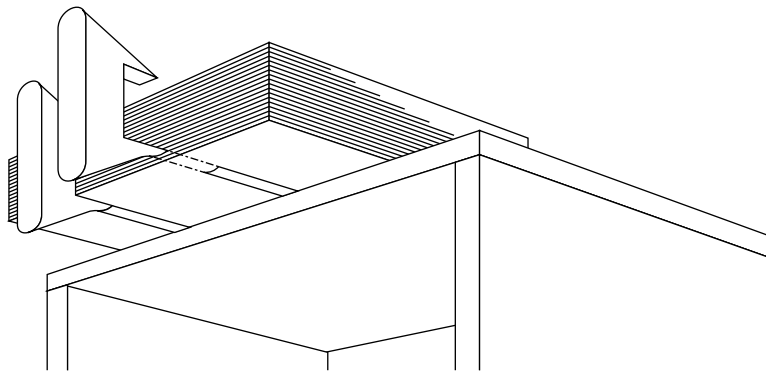
Figure 10-1   Attaching the Workstation Stand to the Workstation

4. Press each piece of the stand onto the workstation, aligning the pieces with the guides.

5. Tip the workstation down onto the floor so that it rests on the stand. Place it under or beside your desk or workspace, as shown in Figure 10-2.
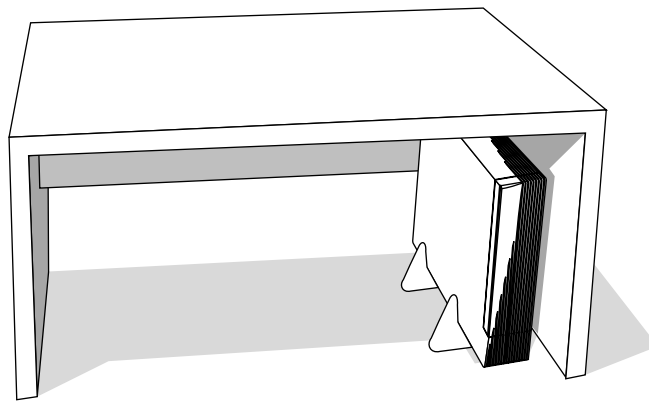
Figure 10-2   Placing Your Workstation Under Your Desk

ANSI Standard for Visual Display Terminal (VDT) Workstations

Table 10-2 shows recommended guidelines for furniture and system adjustment, as developed by the American National Standards Institute (ANSI).[1]

Local VDT guidelines issued by country, state, or municipality may apply and supercede the guidelines in Table 10-2.

Table 10-2   ANSI/HFS 100-1988 Guidelines for VDT Workplace Adjustment

Adjustment	Small Female cm (in)	Midpoint cm (in)	Large Male cm (in)
Seat pan height	40.6 (16.0)	46.3 (18.2)	52.0 (20.5)
Work surface height (keyboard and mouse)	58.5 (23.0)	64.75 (25.5)	71.0 (28.0)
Screen viewing height	103.1 (40.6)	118.1 (46.5)	133.1 (52.4)
Screen viewing distance	>30.5 (>12)	>30.5 (>12)	>30.5 (>12)
Screen viewing angle	0-60 degrees	0-60 degrees	0-60 degrees

---

[1] *American National Standard for Human Factors Engineering of Visual Display Terminal Workstations.* ANSI/HFS 100-1988. Available through the Human Factors Society, Inc. P.O. Box 1369, Santa Monica CA 90406, USA.

Adjustment parameters are defined in Figure 10-3. Guidelines are shown for small females (standing height of 150 cm or 59 in.) and large males (standing height of 185 cm or 73 in.). Midpoints are also interpolated for persons of more average height.
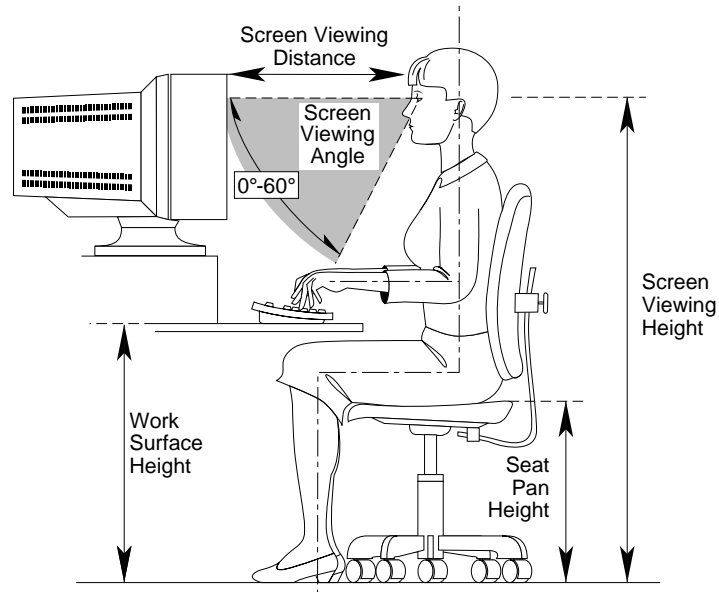
Figure 10-3   Basic Parameters of VDT Workstation Adjustment
(Adapted From ANSI/HFS 100-1988)

Computer Aided Design (CAD) Operator Preferences

If you work on a CAD system, you may feel more comfortable using the ranges of adjustment shown in Table 10-3.

Table 10-3   Workstation Adjustments Preferred by CAD Users[a]

Adjustment	Mean cm (in.)	Range cm (in.)
Seat pan height	54 (21.3)	50-57 (19.7-22.4)
Work surface height	73 (28.7)	70-80 (27.6 -31.5)
Monitor center above floor	113 (44.5)	107-115 (42.1-45.3)
Screen viewing distance	70 (27.6)	59-78 (23.2-30.7)
Work surface tilt	8.6 degrees	2-13 degrees
Monitor tilt[b]	-7.7 degrees	-15 - +1 degrees

a. Derived from Grandjean, Etienne. *Ergonomics in Computerized Offices*. London: Taylor & Francis Ltd., 1987, p. 148.

b. negative tilt = a forward monitor inclination (top of the screen toward the operator)

Tips for Setting Up an Ergonomic Work Environment

The following tips may be useful for setting up an ergonomic work environment that is safe, comfortable, and productive. Although you may be able to perform this procedure yourself, it is useful to work with a friend to achieve the best fit.

Facilities Selection

1. A good work chair should swivel, and you should be able to adjust the seat height while sitting. The seat should have a rounded front edge. The chair should have a large enough base to remain stable when adjusted to its maximum height. It should have castors or glides. Many chairs rock, which may partially relieve the muscle tension from sitting in a fixed position. Some chairs can also be adjusted for seat tilt and depth, armrest height, backrest angle, and lower back support. Check the instructions that came with your chair to take advantage of its adjustability features.

2. Select a work surface that provides enough space to do your work without excessive turning, twisting, or stretching. The height of the work surface should be adjustable and, if possible, it should be wide enough to use the mouse and keyboard at the same height. This helps your neck, shoulders, and upper arms to stay relaxed while you work.

3. Indirect lighting should be used, whenever possible, to prevent glare on the display screen. If you prefer lower levels of lighting than is usually found in offices (for example, 200-250 lx), separate task lighting may be needed for reading documents. Wearing darker-colored clothing helps minimize glare reflections on the screen.

Adjusting Your Chair, Work Surface, and Monitor

1. Adjust your chair first, from a seated position if possible. Your lower leg and thigh should form approximately a 90-degree angle at the knee, and your feet should rest flat on the floor. If you are short, you may want to use a footrest for better comfort.

2. Once your chair is adjusted, raise or lower your work surface to a height that allows you to keep the wrists flat and straight while using the keyboard and mouse. The angle between your lower and upper arm should be 70-90 degrees at the elbow. If necessary, use a padded wrist rest under the keyboard to support your wrists.

3. To minimize screen glare, position your monitor screen perpendicular to overhead lighting sources and windows. Do not set the monitor in front of or behind a window, or parallel to other sources of light. Tilting the screen forward slightly helps avoid glare. Adjusting the monitor controls to minimize brightness and maximize contrast may also reduce the effects of glare.

4. Adjust your monitor height so that your line of sight in your regular seated position is at or near the top the screen. You should be able to see the whole screen without tilting your head forward or backward, within a 60-degree viewing angle of the normal line of sight. With smaller monitors, this may require using a display stand under the monitor base. With larger monitors, it may require a longer viewing distance (see Table 10-3).

5. These adjustment steps should be done each time a different person uses the workstation.

Workstation Usage

1. When using the keyboard, mouse, or other input devices, keep the wrists flat as much as possible, and do not rotate the hands inward toward the thumbs or outward toward the fingers.

2. Electronic keyboards and input devices do not require as much force to operate as manual typewriters. Type or click lightly on the keyboard or mouse.

3. Document stands can be mounted on the work surface or swing out on an arm to position documents next to the display. These can be helpful in maintaining a healthy posture for using the workstation (head in approximately a straight line with the body).

4. You may find it helpful to take rest breaks of several minutes every one to two hours. During breaks, focus your eyes on objects or scenery at least 30 feet away, stretch, and move around.

Manufacturer's Regulatory Declarations

Caution: Your workstation has several governmental and third-party approvals, licenses, permits. Do not modify this product in any way that is not expressly approved by Silicon Graphics. If you do, you may lose these approvals and your governmental agency authority to operate this device.

The Indigo^2 IMPACT workstation conforms to several national and international specifications and European Directives listed on the "Manufacturer's Declaration of Conformity." The CE insignia displayed on each device is an indication of conformity to the European requirements.

Manufacturer's Declaration of Conformity

A "Manufacturer's Declaration of Conformity" is available on the World Wide Web. Look on your system (regulatory) label on the rear of your workstation to determine your CMN (model) number which you will need to identify your Declaration of Conformity. See Appendix C, "Exterior and Interior of Workstation," for the location of your system label.

Enter: "http://www.sgi.com/Products/compliance/index.html" in your browser location window. Locate and print or save your Declaration of Conformity. Make a note of your CMN number and the date on the Declaration of Conformity here for future reference.

Regulatory Label

Follow the steps below for placement of the upgrade regulatory label.

1. If you received a regulatory label with a graphics board upgrade, place the label below the logos and over the lower portion of the regulatory label on the rear of your workstation. See Appendix C, "Exterior and Interior of Workstation," Back of Chassis, for placement of the upgrade regulatory label.

2. If you received a regulatory label with a processor upgrade, it may be one of two sizes.

   ■ Place the full-size label over the full-size regulatory label on the rear of the workstation. See Appendix C, "Exterior and Interior of Workstation," Exterior View, for placement of the full-size regulatory label.

   ■ Place the "half-size label" below the logos and over the lower portion of the regulatory label on the rear of your workstation. See Appendix C, "Exterior and Interior of Workstation," Exterior View, for placement of the upgrade regulatory label.

Electromagnetic Emissions

The following information applies to the system base configuration. Refer to the Manufacturer's Declaration of Conformity for your system's specific classification. For details, refer to "Manufacturer's Declaration of Conformity" on page 307 of this chapter.

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 Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

This device complies with Class B 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 B limits for Information Technology Equipment; and Japan's VCCI Class 2 limits.

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅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。

Radio and Television Interference

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

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

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

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

- Turn the television or radio antenna until the interference stops.

- Move the workstation to one side or the other of the radio or television.

- Move the workstation farther away from the radio or television.

- Plug the workstation into an outlet that is on a different circuit from the radio or television. (That is, make certain the workstation and the radio or television are on circuits controlled by different circuit breakers or fuses.)

Shielded Cables

The Indigo^2 IMPACT workstation is FCC-compliant under test conditions that include the use of shielded cables between Indigo^2 IMPACT and its peripherals. Your Indigo^2 IMPACT 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.

In Germany, a shielded cable must be used on the Ethernet 10-BASE T port.

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.

Electrostatic Discharge

Silicon Graphics designs and tests its products to be immune to the 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^2 IMPACT you keep all the covers and doors, including the plastics, in place. The shielded cables that came with the workstation 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.

Limited User Warranty

Silicon Graphics, Inc. warrants this hardware product, option or accessory against defects in material and workmanship for a period of ninety (90) days after the date of its original retail purchase (the "Warranty Period"). If you discover a defect in the Product during the Warranty Period, Silicon Graphics will, at its sole option, repair or replace the Product at no charge to you, provided that you (i) return the product (transportation charges prepaid) during the Warranty Period to the authorized Silicon Graphics dealer (or Silicon Graphics service center, if purchased directly from Silicon Graphics) from whom it was purchased, or return it to another authorized Silicon Graphics dealer in the country of its original purchase, and (ii) have included a copy of a bill of sale bearing the appropriate Silicon Graphics serial number as proof of the original date and location of the Product's purchase. This warranty applies only to hardware products manufactured by or for Silicon Graphics and distributed under Silicon Graphics' trademarks, and does not apply to any (i) Silicon Graphics software accompanying the Product, which is licensed under a separate statement included with the software, (ii) Product that has been damaged by abuse, accident, misuse, misapplication or improper installation, and (iii) any Product that has been modified or has had its serial number removed or defaced.

The warranties and remedies specified above are exclusive, and are in lieu of, and Silicon Graphics disclaims, all others, express, implied, oral or otherwise, including, without limitation, any warranty of merchantability or fitness for a particular purpose. No oral or written information or advice given by Silicon Graphics, or its dealers or distributors, will create a warranty or increase the scope of this warranty, and you may not rely on such information or advice. Some states do not allow the exclusion of implied warranties, so the exclusion above may not apply to you. Any applicable implied warranties are limited in duration to the period of time specified above. This warranty gives you specific legal rights, and you may have other rights that vary from state to state. Silicon Graphics is not liable for any special, consequential, incidental or indirect damages of any kind (including without limitation loss of profits, data or goodwill, or property damage), whether or not Silicon Graphics has been advised of the possibility of such loss, however caused and on any theory of liability, arising out of the use of the product, or resulting from a breach of this warranty. These limitations shall apply notwithstanding the failure of the essential purpose of any limited remedy. Silicon Graphics' liability for actual damages for any cause whatsoever, regardless of the form of action, will be limited to the

net amount paid by you for the purchase of the Product that caused the damages or is directly related to the cause of action. Some states do not allow the limitation or exclusion of liability for incidental or consequential damages, so this limitation may not apply to you.

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Mountain View, CA 94039-7311

Cable Pinout Assignments

This appendix contains cable pinout information for the following ports located on the back of the Indigo^2 IMPACT workstation:

- serial

- parallel

- Ethernet 10-BASE T

- Ethernet AUI

- keyboard

- mouse

- SCSI

- audio

- monitor

- video

Serial Ports
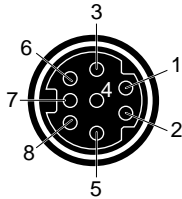
Figure A-1   4D Compatible Serial Port Pinout Assignments

Table A-1 and Table A-2 show cable pinout assignments for the serial ports.

Table A-1   4D Compatible Pin Assignments (RS-232)

Pin	Assignment	Description
1	DTR	Data Terminal Ready
2	CTS	Clear To Send
3	TD	Transmit Data
4	SG	Signal Ground
5	RD	Receive Data
6	RTS	Request To Send
7	DCD	Data Carrier Detect
8	SG	Signal Ground
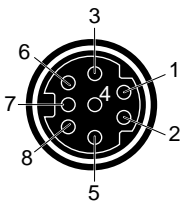
Figure A-2   Macintosh SE Compatible Serial Port Pinout Assignments

Table A-2   Macintosh SE Compatible Pin Assignments (RS-422)

Pin	Assignment	Description
1	HSKo	Output Handshake
2	HSKi	Input Handshake Or External Clock
3	TxD–	Transmit Data –
4	GND	Signal Ground
5	RxD–	Receive Data –
6	TxD+	Transmit Data +
7	GPi	General Purpose Input
8	RxD+	Receive Data +

Parallel Port
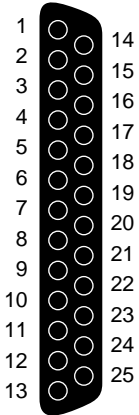
Figure A-3   Parallel Port Pinout Assignments

Table A-3 shows the cable pinout assignments for the parallel port.

Table A-3   Parallel Port (25-Pin DSUB Connector)

Pin	Assignment
1	STROBE
2	DATA(0)
3	DATA(1)
4	DATA(2)
5	DATA(3)
6	DATA(4)
7	DATA(5)
8	DATA(6)
9	DATA(7)
10	ACK
11	BUSY
12	PE (Paper End)
13	SELECT
14	AUTOFEED
15	ERROR/FAULT
16	INIT/RESET
17	SELECT-IN (Direction)
18	GROUND
19	GROUND
20	GROUND
21	GROUND
22	GROUND
23	GROUND

Table A-3 (continued)   Parallel Port (25-Pin DSUB Connector)

Pin	Assignment
24	GROUND
25	GROUND

Ethernet 10-BASE T
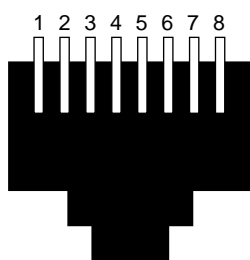
Figure A-4   Ethernet 10-BASE T Port Pinout Assignments

Table A-4 shows the cable pinout assignments for the Ethernet 10-BASE T port.

Table A-4   Ethernet 10-BASE T Port

Pin	Assignment
1	TRANSMIT+
2	TRANSMIT–
3	RECEIVE+
4	(Reserved)
5	(Reserved)
6	RECEIVE–
7	(Reserved)
8	(Reserved)

Ethernet AU
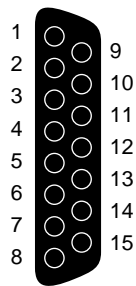
Figure A-5   Ethernet AUI Port Pinout Assignments

Table A-5 shows the cable pinout assignments for the Ethernet AUI port.

Table A-5   Ethernet AUI Port (Thicknet)

Pin	Assignment
1	GROUND
2	COLLISION+
3	TRANSMIT+
4	GROUND
5	RECEIVE+
6	GROUND
7	(Reserved)
8	GROUND
9	COLLISION-
10	TRANSMIT-
11	GROUND
12	RECEIVE-
13	+12V

Table A-5 (continued)   Ethernet AUI Port (Thicknet)

Pin	Assignment
14	GROUND
15	(Reserved)

Keyboard
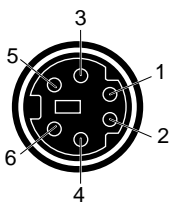
Figure A-6   Keyboard Port Pinout Assignments

Table A-6 shows the cable pinout assignments for the keyboard port.

Table A-6   Keyboard Port (6-Pin MINIDIN)

Pin	Assignment
1	KEYBOARD DATA
2	(Reserved)
3	GROUND
4	KEYBOARD POWER (+5V)
5	KEYBOARD CLOCK
6	(Reserved)

Mouse
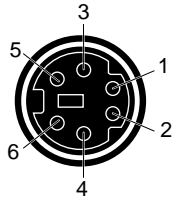
Figure A-7   Mouse Port Pinout Assignments

Table A-7 shows the cable pinout assignments for the mouse port.

Table A-7   Mouse Port (6-Pin MINIDIN)

Pin	Assignment
1	MOUSE DATA
2	(Reserved)
3	GROUND
4	MOUSE POWER (+5V)
5	MOUSE CLOCK
6	(Reserved)

SCSI Port
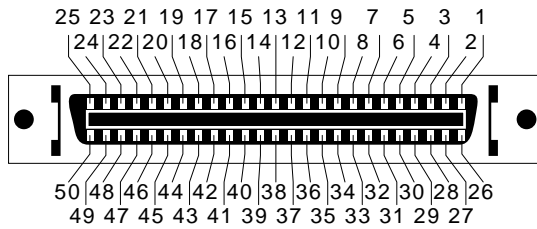
Figure A-8   SCSI Port Pinout Assignments

Table A-8 shows the cable pinout assignments for the SCSI port.

Table A-8   SCSI Port

Pin	Assignment
1	GROUND
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	GROUND
7	GROUND
8	GROUND
9	GROUND
10	GROUND
11	GROUND
12	Reserved
13	Open
14	Reserved
15	GROUND
16	GROUND
17	GROUND
18	GROUND
19	GROUND
20	GROUND
21	GROUND
22	GROUND
23	GROUND

Table A-8 (continued)   SCSI Port

Pin	Assignment
24	GROUND
25	GROUND
26	DB(0)
27	DB(1)
28	DB(2)
29	DB(3)
30	DB(4)
31	DB(5)
32	DB(6)
33	DB(7)
34	DB(P)
35	GROUND
36	GROUND
37	Reserved
38	TERMPWR
39	Reserved
40	GROUND
41	ATN
42	GROUND
43	BSY
44	ACK
45	RST
46	MSG
47	SEL

Table A-8 (continued)   SCSI Port

Pin	Assignment
48	C/D
49	REQ
50	I/O

Audio

Table A-9 shows the cable pinout assignments for the audio ports.

Table A-9   Audio Ports

Connector	Tip	Ring	Sleeve
Digital Input/Output	Out	In	GROUND
Headphone Output	L	R	GROUND
Line Output	L	R	GROUND
Line Input	L	R	GROUND
Microphone Input	L	R	GROUND

Monitor
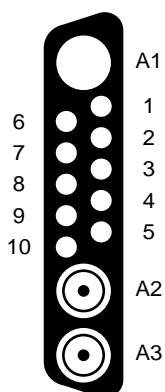
Figure A-9   Monitor Pinout Assignments

Table A-10 shows the monitor pinout assignments.

Table A-10   Monitor Port

Pin	Assignment
A1	Red Signal, Analog
A2	Green Signal, Analog
A3	Blue Signal, Analog
1	Monitor ID Bit 3, TTL
2	Monitor ID Bit 0, TTL
3	Composite Sync (Active Low), TTL
4	Horizontal Drive (Active High), TTL
5	Vertical Drive (Active High), TTL
6	Monitor ID Bit 1, TTL
7	Monitor ID Bit 2, TTL
8	Ground

Table A-10 (continued)   Monitor Port

Pin	Assignment
9	Ground
10	Ground

Video
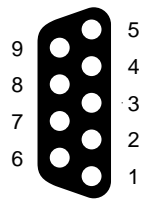
Figure A-10   Video Pinout Assignments

Table A-11 shows the video pinout assignments.

Table A-11   Video Port (on graphics board)

Pin	Assignment
1	Stereo left/right Eye Signal (1=left, 0=right) (STEREO_LEFT)
2	Signal Return Ground
3	Reserved for Future Use
4	Signal Return Ground
5	Reserved for Future Use
6	Digital Return Ground
7	Digital Return Ground for Stereo View
8	+12V DC Output to Stereoview Device
9	Unused

International Keyboard Support

The Indigo^2 IMPACT system uses a PC-compatible keyboard that does not support software identification for the varied international keyboard languages that Silicon Graphics offers.

Instead, you can select the keyboard layout from the System Maintenance menu. To do this, follow these steps:

1. After you've assembled the workstation, turn on the power.

    ■   Press the power switch on the front of the monitor to turn on your monitor.

    ■   Open the cover on the front of the Indigo^2 IMPACT by snapping it away from the top edge of the chassis and tipping it down, as shown in Figure B-1.
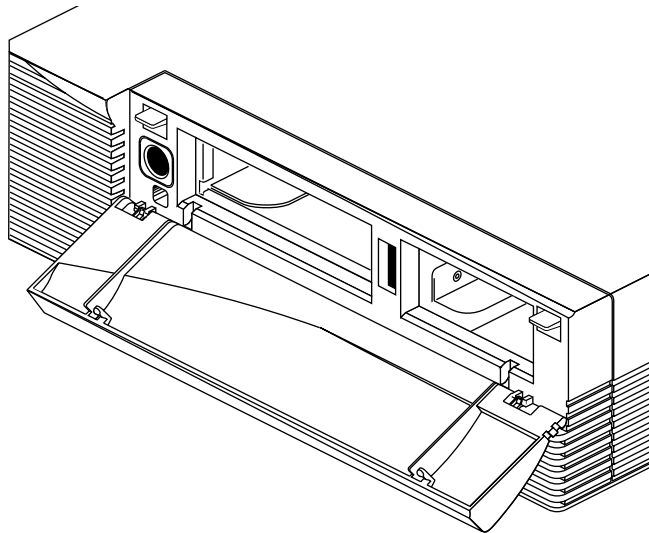
Figure B-1   Opening the Front Cover of the Indigo^2 IMPACT Workstation

■   Press the power switch to turn on the system, as shown in Figure B-2.
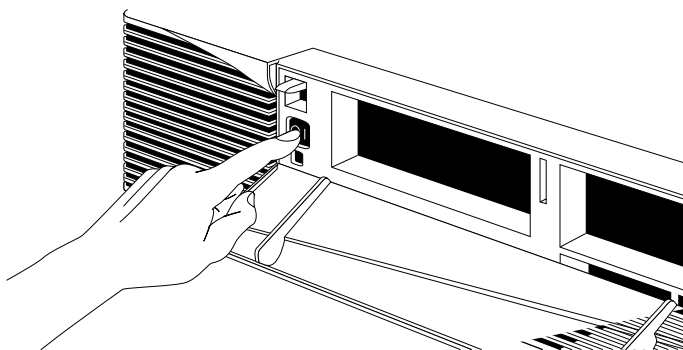
Figure B-2   Turning On the Indigo^2 IMPACT Workstation

2.   While the system is powering up, you see the notifier shown in Figure B-3 on your monitor screen.
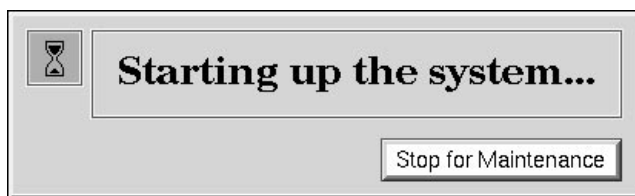
Figure B-3   System Startup Notifier

3.   Click *Stop for Maintenance* to display the System Maintenance menu icons.

4. Click the Select Keyboard Layout icon.

   The keyboard layout menu is displayed, as shown in Figure B-4.
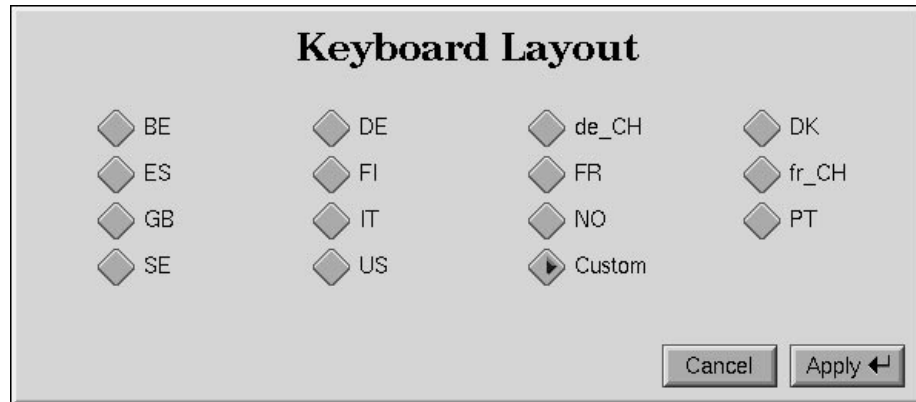
Figure B-4   Keyboard Layout Form

5. Click the box next to the name that describes your keyboard, then click *Apply*.

   Table B-1 lists the keyboard layout choices and their corresponding languages.

Table B-1   Keyboard Layout Language Choices

Keyboard Layout	Language
BE	Belgian
DE	German
de_CH	Swiss German
DK	Danish
ES	Spanish
FI	Finnish
FR	French
fr_CH	Swiss French
GB	Great Britain

Table B-1 (continued)   Keyboard Layout Language Choices

Keyboard Layout	Language
IT	Italian
NO	Norwegian
PT	Portuguese
SE	Swedish
US	United States
Custom	Language you select

To test if the correct layout was selected, click the Command Monitor icon, and try typing some sample text, including special characters specific to your keyboard.

Exterior and Interior of Workstation

This appendix contains exterior and interior views of the Indigo^2 IMPACT workstation. Call-outs identify parts, ports, and cabling referenced throughout this owner's guide.

Exterior View
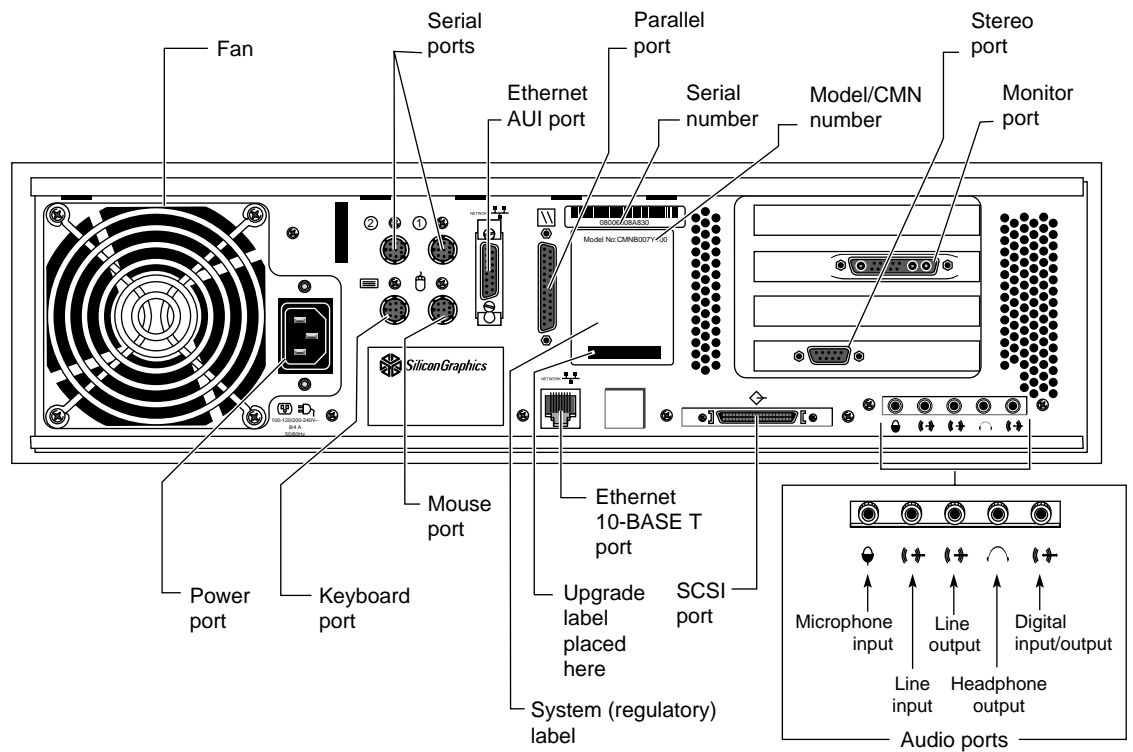
Figure C-1　　Back of Chassis

Interior View

Power supply

Memory SIMMs

CPU module

Boards

Optional drive

System drive
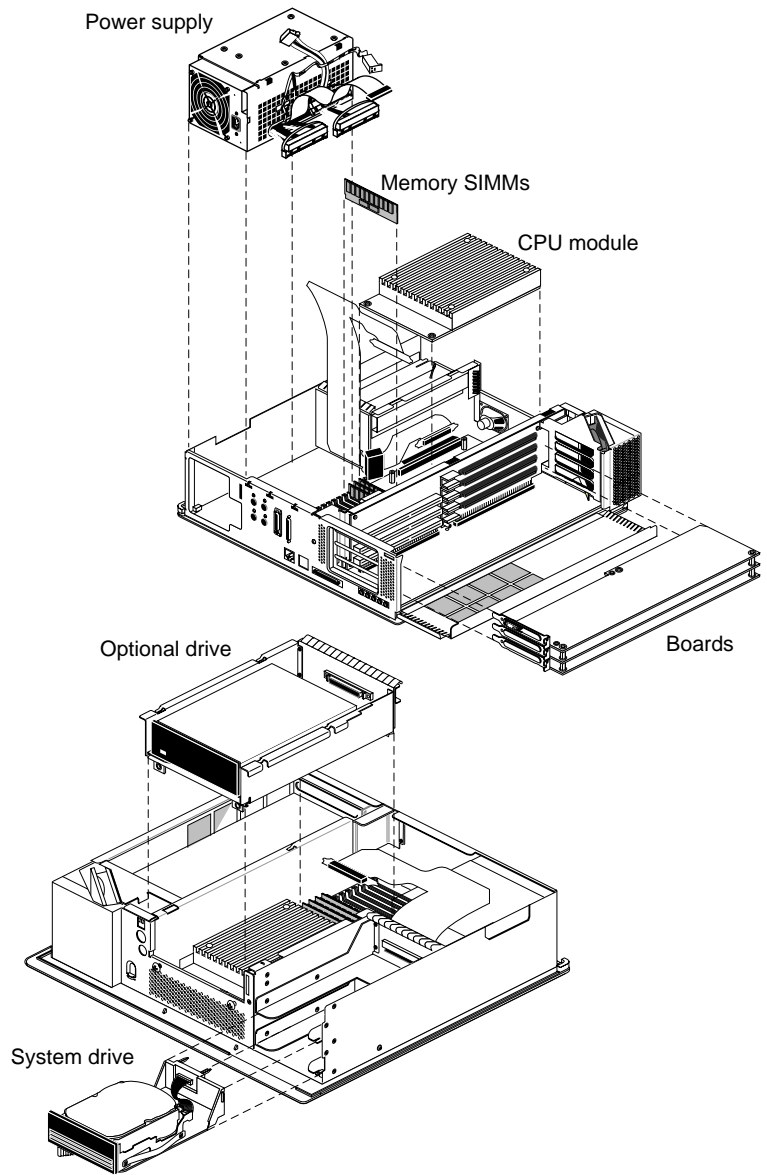
Figure C-2   Interior of Workstation

Glossary

account

See login account.

active window

The only window that recognizes input (activity) from the keyboard and mouse; only one window is active at a time.

address dial

See SCSI address dial.

administrator

See system administrator and network administrator.

back up

To copy a certain set of files and directories from your hard disk to a tape.

backup tape

A tape that contains a copy of the files and directories that are on your hard disk. A full backup tape contains a copy of all files and directories, including IRIX, that are on your hard disk.

baud rate

The speed (calculated as bits per second) at which the computer sends information to a serial device, such as a modem or terminal.

bezel

The frame that holds the front cover. It attaches to the front of the chassis.

blanking panel

A piece of black plastic attached to the front plastic panel of the Indigo chassis that covers either the top or middle drive slot. You remove a blanking panel after you install a drive in the slot that it was covering.

boot

To start up the system by turning on the workstation and monitor; the system is fully booted when you see the `console login:` prompt or the login screen.

button

On a mouse, a button is a switch that you press with a finger. In a window on your screen, a button is a labelled rectangle that you click using the cursor and mouse.

CD-ROM disc (CD)

A flat metallic disk that contains information that you can view and copy onto your own hard disk; you cannot change or add to its information. CD-ROM is short for *compact disc read-only memory.*

CPU board

The printed circuit board within your workstation chassis that contains the central processing unit(s). When you open the front metal panel of the Indigo chassis, it is the board on the left.

card guides

Narrow metal tracks at the top and bottom of the chassis into which you slide printed circuit boards.

chassis

The exterior metal framework of the workstation that contains its working parts.

choose

To press the left mouse button to bring up a popup menu, move the cursor to highlight the command that you want to run, then release the button.

click

To hold the mouse still, then press and immediately release a mouse button.

configuration file

A system file that you change to customize the way your system behaves. Such files are sometimes referred to as customization files.

confidence test

A test that you run to make sure a particular device (such as the keyboard, mouse, or a drive) is set up and working properly.

connector

Hardware at the end of a cable that lets you fasten the cable to an outlet, port, or other connector.

console window

The window that appears as a stowed icon each time you log in; IRIX reports all status and error messages to this window.

current working directory

The directory within the filesystem in which you are located when you are working in a shell window.

cursor

The small red arrow or other shape on the screen that follows the movements of the mouse. It may change shape depending on its location on the screen.

DAT

Digital Audio Tape. The Silicon Graphics DAT drive can be used with both audio and digital media.

default printer

The printer to which the system directs a print request if you do not specify a printer when you make the request. You set the default printer using the Print Manager.

defaults

A set of behaviors that Silicon Graphics specifies on every system. You can later change these specifications, which range from how your screen looks to what type of drive you want to use to install new software.

diagnostics

A series of tests that check the hardware components of your system.

directory

A special file in the filesystem in which you store other directories and files.

disk use

The percentage of space on your disk that contains information.

disk resource

Any disk (hard, CD-ROM, floppy or floptical) that you can access either because it is physically attached to your workstation with a cable, or because it is available over the network using NFS.

double-click

To hold the mouse still, then press and release a button twice, very rapidly. When you double-click an icon, it opens into a window; when you double-click the *Window menu* button, the window closes.

drag

To press and hold down a mouse button, then move the mouse. This drags the cursor to move icons or to highlight menu items.

drive

A hardware device that lets you access information on various forms of media, such as hard and floppy disks, CD-ROM discs, and magnetic tapes.

drive address

See SCSI address.

EISA board

Extended Industry Standard Architecture boards are option boards that add functionality to your system through a standard bus.

external device

Any piece of hardware that is attached to the workstation with a cable.

export

To use NFS software to make all or part of your filesystem available to other users and systems on the network.

female connector

A connector that has indentations or holes into which you plug a male connector. An example of a female connector is an electrical wall outlet that accepts an electrical plug.

field

An area in a window in which you can type text.

file

A set of disk blocks in which you store information such as text, programs, or images that you created using an application.

filesystem

A hierarchy of directories and files. Directories contain other directories and files; files cannot contain directories. The *root* (/) directory is at the top of the hierarchy.

form

A window containing buttons that you must click and/or editable fields that you must fill in.

GIO

Graphics input/output.

GIO boards

Graphics Input/Output option boards, such video and networking boards, add functionality to your workstation. They connect to the midplane using the GIO option slots.

graphics board

The printed circuit board within your workstation that contains the graphics processors. When you open the front metal panel of the Indigo chassis, it is the board on the right.

grounded electrical outlet

An electrical wall outlet that accepts a plug with a grounding prong. In the U.S.A., all three-prong outlets are grounded.

handshake

The protocol that controls the flow of information between a workstation and a printer.

highlight

To change the color of an item on the screen by positioning the cursor over it (locate-highlight), or by positioning the cursor over it and pressing a mouse button.

home directory

The directory into which IRIX places you each time you log in. It is specified in your login account; you own this directory and, typically, all its contents.

host

Any system connected to the network.

hostname

The name that uniquely identifies each host (system) on the network.

Human Factors guidelines

A set of standards and suggestions for making your working environment more comfortable and healthy.

icon

A small picture that represents a stowed or closed file, directory, application, or IRIX process.

internal drive

A drive that fits inside the workstation and connects to an internal port; it is never connected with a cable to a visible external port. An internal drive is occasionally referred to as a front-loading drive.

IP address

A number that uniquely identifies each host (system) on a TCP/IP network.

IRIS

A graphics workstation manufactured by Silicon Graphics, Inc.

IRIX

The Silicon Graphics version of the UNIX operating system. *See also* system software.

jot

A mouse- and window-based text editor that is included as part of the IRIX operating system.

KB (kilobyte)

A standard unit for measuring the information storage capacity of disks and memory (RAM and ROM); 1024 bytes make one kilobyte, in most uses.

LED

Light Emitting Diode. A light on a piece of hardware that indicates status or error conditions.

launch

To start up an application, often by double-clicking an icon.

local workstation

The physical workstation whose keyboard and mouse you are using, all hardware that is connected to that workstation, and all software that resides on that hardware or its removable media.

lockbar

A long piece of metal with a hole on the end that you attach to the chassis. It allows you to secure the workstation with a lock and locking cable.

log in

To give the system your login name so you can start a session on the workstation.

log out

To end a session on the workstation.

login account

A database of information about each user that, at the minimum, consists of the login name, user ID, and home directory.

login name

A name that uniquely identifies a user to the system.

login screen

The window that you see after powering on the system, before you can access files and directories. The window contains one icon for each login account on the system.

MB (megabyte)

A standard unit for measuring the information storage capacity of disks and memory (RAM and ROM); 1024 kilobytes make one megabyte, in most uses.

male connector

A connector that has raised edges, pins, or other protruding parts that you plug into a female connector. An example of a male connector is an electrical plug that you plug into a wall outlet.

man page

See Reference page.

menu

A list of operations or commands that the workstation can carry out on various objects on the screen.

midplane

The circuit board that connects EISA and GIO boards to the system board.

monitor

A hardware device that displays the images, windows, and text with which you interact to use the system. It is also called a video display terminal (VDT).

monitor video cable

The cable that connects the monitor to the workstation to transmit video signals. It is thick and beige, with large connectors on both ends.

monitor power cable

The cable that connects the monitor to the workstation to provide power to the monitor. It is thick and beige, with a male connector on one end and a female connector on the other.

mount point

The directory on your workstation from which you access information that is stored on a local or remote disk resource.

mount

To make a file system that is stored on a local or remote disk resource accessible from a specific directory on your workstation.

mouse

A hardware device that you use to communicate with windows and icons. You move the mouse to move the cursor on the screen, and you press its buttons to initiate operations.

mouse pad

For an optical mouse, this is the rectangular, metallic surface that reads the movements of the mouse. For a mechanical mouse, this is a clean, smooth, rectangular surface that makes the mouse's track ball roll efficiently.

network

A group of computers and other devices (such as printers) that communicate with each other electronically to transfer and share information.

network administrator

The individual(s) responsible for setting up, maintaining, and troubleshooting the network, and for supplying setup information to system administrators of each system.

notifier

A form that appears when the system requires you to confirm an operation that you just requested, or when an error occurs.

open

To double-click an icon, or to select an icon, then choose "Open" from a menu in order to display a window that contains the information that the icon represents.

option drive

Any internal drive other than the system disk. Option drives include floppy disk drives, secondary hard disk drives, or DAT drives.

outlets

Openings in the hardware to which you attach connectors to make an electrical connection.

PROM monitor

The interface that you use to communicate with the system after it is powered on, but before it is booted and running IRIX.

Printer Manager

A tool that you access through either the System toolchest or the System Manager. Use it to set up printer software and monitor jobs that you send to the printer.

parallel port

An outlet on the workstation to which you connect external printers and similar devices.

password

A combination of letters and/or numbers that only you know; it is an optional element of your login account. If you specify a password for your account, you must type it after you type your login name before the system will let you access files and directories.

pathname

The list of directories that leads you from the *root* (/) directory to a specific file or directory in the file system.

peripheral

A hardware device that adds more functionality to the basic workstation, such as a tape drive. *See also* external devices and internal drives.

port

An outlet to which you attach cable connectors.

power-on diagnostics

A series of tests that automatically check the hardware components of your system each time you turn it on.

power cable

The cable that connects the workstation to a grounded electrical outlet.

power off

To turn off the power switches on the workstation chassis and the monitor.

power supply

The piece of hardware within the Indigo chassis that directs power from an electrical outlet to the chassis, monitor, and internal SCSI devices. It also contains the power switch, reset button, and fan.

prompt

A character or word that the system displays in an IRIX shell; it indicates that the system is ready to accept commands. The default prompt for regular user accounts is %; the default prompt for the root account is #.

quit

To stop running an application.

reference page

An online document that describes how to use a particular IRIX command.

remote workstation, drive, disk, file system, or printer

A hardware device, or the information or media it contains, that you can access across the network; they are not physically connected to your workstation.

reset button

A physical button on the workstation that you can press, which cuts off power to the workstation and then immediately restores it. You should never press this button while IRIX is running, unless all attempts to shut down the system using software fail. *See also* shut down.

restore (files)

To copy files that once resided on your hard disk from another disk or a tape back onto your hard disk.

***root* account**

The standard IRIX login account reserved for use by the system administrator. This account's home directory is the *root* (/) directory of the filesystem; the user of the *root* account has full access to the entire filesystem (that is, can change and delete any file or directory). The user of this account is sometimes referred to as the *superuser*.

root (_/_) directory

The directory at the top of the filesystem hierarchy.

SCSI

Small Computer System Interface (pronounced "scuzzy"). SCSI is a high- speed input/output specification for small computers. Indigo^2 IMPACT is SCSI-2 compliant and supports two fast/narrow/single-ended SCSI buses, each capable of transforming data at 10 MB per second.

SCSI address

A number from one to seven that uniquely identifies a SCSI device to a system. No two SCSI devices that are physically connected to the same SCSI bus can have the same SCSI address.

SCSI address dial

A small plastic dial connected to some Silicon Graphics external SCSI devices. Click on its small buttons to select a SCSI address for a new SCSI device.

SCSI bus length

The combined length of all internal and external SCSI cables in a system for each SCSI bus.

SCSI cable

A cable that connects a SCSI device to a SCSI port on a workstation.

SCSI device

A hardware device that uses the SCSI protocol to communicate with the system. Hard disk and floppy disks, CD-ROM discs, and tape drives are all SCSI devices. _See also_ SCSI.

SCSI terminator

An electronics device, often an external plug, that is required at the end of each SCSI bus. Indigo^2 IMPACT uses active terminators.

SIMM

A small printed circuit board with DRAM (Dynamic Random Access Memory) chips.

SIMM removal tool

An L-shaped metal tool that you use to loosen SIMMs installed in the SIMM sockets.

SIMM socket

A long, thin, female connector located on the CPU board into which you insert a SIMM.

System Manager

A set of tools that the administrator uses to set up and manage the Silicon Graphics workstation. You access the System Manager through the System toolchest.

System toolchest

The toolchest in the upper left-hand corner of the screen, labelled "System." You start system tools, such as System Manager, using this menu.

screen

The portion of the monitor that displays information.

select

To position the cursor over an icon, then click the left mouse button. Once an icon is selected, it is the object of whatever operation you select from a menu.

serial device

Any hardware device that requires a serial cable connection to communicate with the workstation.

serial port

An outlet on the workstation to which you connect external serial devices.

server

A system that other systems on the network access to use its disk space, software, or services.

shell

A window into which you type IRIX commands.

shielded cable

A cable with a protective covering that reduces the possibility of interference with radio, television, and other devices.

shut down

To safely close all files, log out, and bring the workstation to a state where you can safely power it down. Choose "System Shutdown" from the System toolchest menu to do this.

software option

Any software product that you buy from Silicon Graphics other than the standard system software that comes on your system disk.

standalone workstation

A workstation that is not connected to a network.

static electricity

Whenever your body comes in physical contact with metal parts (including printed circuit boards) of computer equipment there is the potential for you to feel an electrical shock (electro-static discharge, or ESD) which could damage the equipment. To prevent this, you must always wear a wrist strap when working with the internal parts of a workstation.

superuser

A user with root privileges. You become a superuser by logging in as root, by typing su at the shell prompt, or by running programs set up to run as root. *See also* system administrator.

system

All the hardware and software that makes up the workstation.

system administration

The tasks associated with setting up, maintaining, and troubleshooting a networked or standalone system.

system administrator

The individual responsible for setting up, maintaining, and troubleshooting a system. The system administrator uses the *root* login account to perform most administrative tasks.

system crash

When the IRIX operating system fails and the system will not accept any keyboard or mouse input.

system disk

The physical disk that contains the standard IRIX operating system software (the software that makes your workstation run).

system software

The standard IRIX operating system software and Silicon Graphics tools. These come on the system disk and on the CD that you use in the event of a system crash.

TCP/IP

The standard networking software that is included in the system software.

thumbscrew

The ridged knob attached to a screw in a cable connector. You turn it to secure the connector to an outlet.

upgrade

Hardware that you add to the basic workstation to increase performance, such as additional memory (SIMMs) or faster graphics boards.

unmount

To make a filesystem that is accessible from a specific directory on your workstation temporarily unaccessible.

user ID (UID)

A number that uniquely identifies a user to the system.

window

A portion of the screen that you can manipulate that contains text or graphics.

workstation

An assembly of hardware that includes a system board, graphics board, CPU, memory, system disk, and power supply. A workstation can include multiples of these components and optional boards that add functionality. The hardware is enclosed in a chassis with a cover. The addition of a monitor, keyboard, mouse, and software makes it a working system.

wrist strap

A flat cable that you wrap around your wrist and also attach to a metal part of the workstation whenever you work with internal components of the workstation. This prevents electrical shocks to yourself and the components. *See also* static electricity.

Index

Part Request Form

RMA#	
Closed ___/___/___/	

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

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

System Configuration Information:

System S/W Version	Type of failure:	Peripherals:	Voltage:	Disk (MB/GB)	Memory (MB):
_____	☐ Solid ☐ Intermittent	☐ DAT ☐ CD-ROM ☐ Floptical ☐ Other_____	☐ 110 ☐ 220	_____	_____

Problem description (please describe symptoms, error messages and actions taken):

_____
_____
_____
_____

_____ Date _____

Failed part information:

Part Number: Revision: Date:

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