O2™: Silicon Graphics® 1600SW™ Flat Panel Monitor Adapter Installation Guide

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St. Peter's Basilica image courtesy of ENEL SpA and InfoByte SpA. Disk Thrower
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Introduction

This guide tells you how to install the Silicon Graphics 1600SW flat panel monitor adapter board in the O2 workstation. There are two classes of O2 workstations, the R5000, and the R10000. The 1600SW flat panel monitor adapter can be installed in either class of O2 workstation.

The guide is organized as follows:

- Chapter 1 describes how to install the adapter board in your O2 workstation.

- Chapter 2 describes how to adjust the flat panel timing tables and how to calibrate color for the 1600SW flat panel monitor.

- Chapter 3 provides troubleshooting information, technical specifications, and regulatory statements.

- The glossary defines many of the terms used in the manual.

About the Silicon Graphics 1600SW Flat Panel Monitor Adapter Board

The 1600SW flat panel monitor adapter board is installed in the digital display adapter socket on your O2 workstation's system board. This is the same socket that is used for the Presenter 1280 flat panel display.

Your package includes the items listed below. If anything is missing, contact your sales representative.

- Flat panel monitor adapter board

- Reversible Phillips/flat screwdriver

- Antistatic wrist strap

- *O2 Workstations: Silicon Graphics 1600SW Flat Panel Monitor Adapter Installation Guide* (this manual)

- Compact discs (CD-ROMs)

- ColorLock sensor

System Requirements

The Silicon Graphics 1600SW flat panel monitor can be used with any O2 workstation running IRIX 6.5.2 and later. Systems running IRIX 6.5 and 6.5.1 must be upgraded to IRIX 6.5.2. Upgrades and patches are provided on the CD-ROMs included with the adapter board kit.

1600SW Flat Panel Monitor Information

The 1600SW flat panel monitor ships with additional documentation, the *Silicon Graphics 1600SW Flat Panel Monitor Owner's Guide*. This guide describes how to use features of the flat panel monitor and provides technical specifications for the device.

O2 Hardware Information

The *O2 Workstation Hardware Reference Guide* is located on your O2 workstation's hard disk in the IRIS InSight library (unless it has been removed). In this case, you can reinstall it from the IRIX CDs that shipped with your O2 workstation. Locate the online book on your O2 workstation as follows. From the Toolchest on your desktop, choose Help > Online Books > SGI End User > *O2 Workstation Hardware Reference Guide*.

The *O2 Workstation Hardware Reference Guide i*s also available in the Silicon Graphics Technical Publications Library. See the next section, "Technical Publications Library."

Technical Publications Library

A copy of this manual, as well as other Silicon Graphics technical publications, can be found in the Silicon Graphics Technical Publications Library. To access the library, open your Web browser and enter `http://techpubs.sgi.com/library/`

Installing the 1600SW Flat Panel Monitor Adapter Board

This chapter explains how to install the Silicon Graphics 1600SW Flat Panel Monitor adapter board in your O2 workstation. There are two classes of O2 workstations, the R5000 class, and the R10000 class. You can install the 1600SW flat panel monitor adapter in either class. Follow the installation path in this chapter for your class of O2 workstation.

Verifying the Software

To use the Silicon Graphics 1600SW flat panel with an O2 workstation, you need IRIX 6.5.2 or later.

- If you purchased the 1600SW flat panel monitor at the same time as your O2 workstation, 6.5.2 is already installed on your workstation's system disk and you do not need to install additional software.

- If your O2 workstation is running IRIX 6.5, you need to upgrade to IRIX 6.5.2. IRIX upgrades, patches and installation instructions are provided on the CDs included with this kit. Be sure to read any release notes or README files on the CDs.

If you are not sure which IRIX version you are running, in a shell window, enter
`uname -aR`

Tip: Always have your screen saver and power saving features enabled. Using these features dramatically prolongs the life of the backlights in the flat panel monitor and prevents images from burning into the screen.

Using the Flat Panel Monitor with a CRT Monitor

The flat panel monitor was not designed to be used simultaneously with a conventional cathode-ray tube (CRT) monitor when both monitors are attached to the same graphics adapter board. As a result, you must use the 1600SW timing tables whenever the flat panel is connected to your O2 workstation (regardless of CRT use). There will be flicker on the CRT monitor but not the flat panel monitor.

Caution: The 60 Hz timing table is designed for the 1600SW flat panel monitor, and will almost invariably cause your CRT monitor to behave erratically. Use the 50 Hz timing table if you plan to use a CRT monitor.

Tip: Previous O2 monitors are not set to display the wide aspect ratio of the 1600SW properly. Many CRT monitors offer controls to adjust aspect ratio or screen size, which will improve the quality of your CRT image while displaying at 1600SW resolution. Consult your CRT monitor manual for details.

Also note that both the 1600SW flat panel monitor and the CRT monitor display images from the same framebuffer. See Chapter 2 for more information.

Installing the Flat Panel Monitor Adapter Board

If you are sure your O2 workstation has the correct version of IRIX, follow these steps to install the board.

Tip: Always have your screen saver and power saving features enabled. Using these features dramatically prolongs the life of the backlights in the flat panel monitor and prevents images from burning into the screen.

Removing the System Module

Follow these steps to remove the system module:
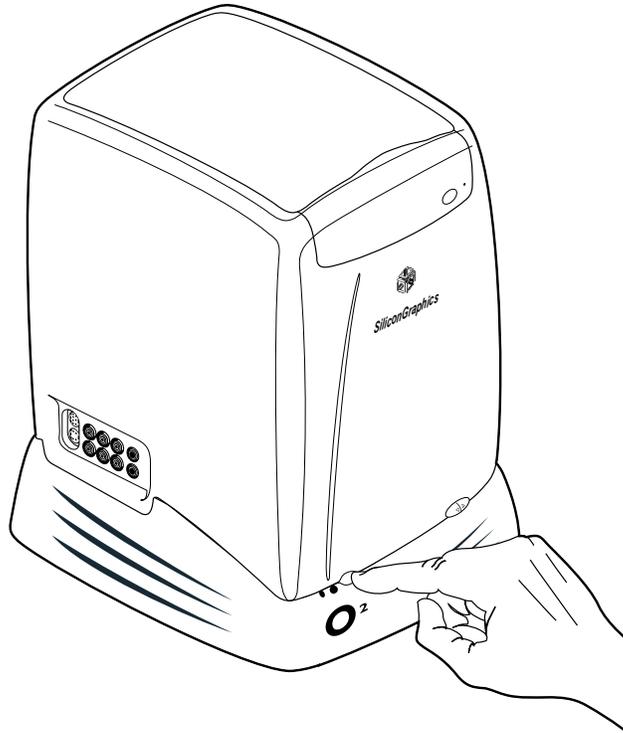
Figure 1-1   Turning Off the Workstation

1. If you haven't already turned off the workstation, do so now by pressing the power button on the front (Figure 1-1).
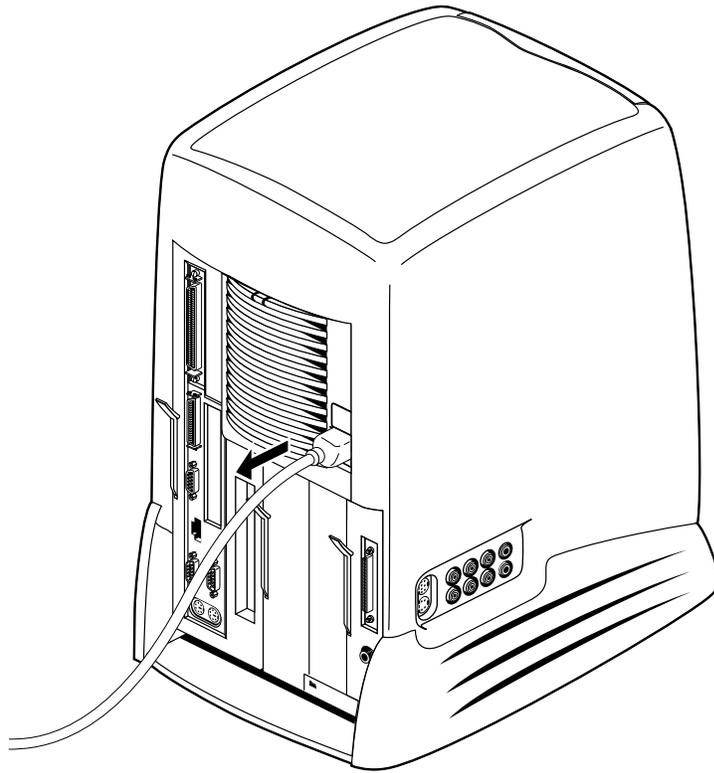
Figure 1-2   Removing the Power Cable

Note: The illustrations in this section shows an O2 R5000 class workstation. Use these instructions also for O2 R10000 class workstations.

2.   Remove the cables, including the power cable (Figure 1-2).
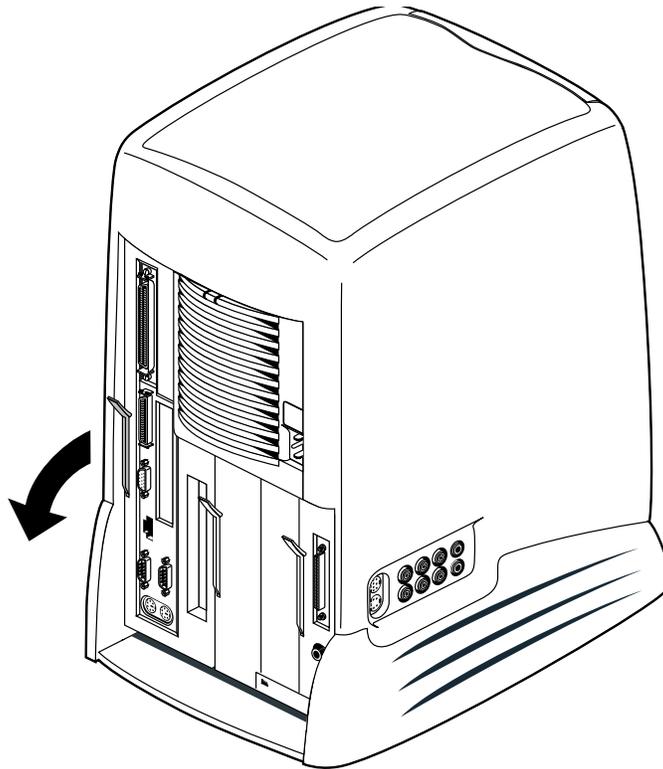
Figure 1-3   Releasing the System Module

3. The system module is on the left as you face the rear. Pull down the lever on the left side of the module to release it (Figure 1-3).
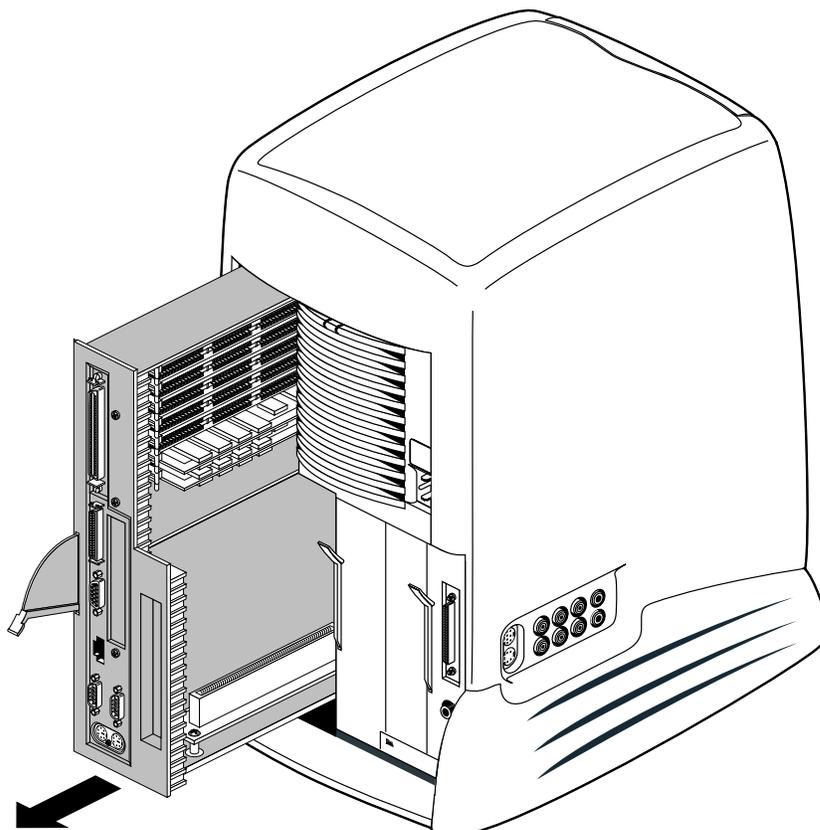
Figure 1-4   Removing the System Module From the Chassis

4. Slide the system module out of the chassis (Figure 1-4).

5. To reach the digital display adapter slot, you need to remove the PCI tray. The procedure for removing the tray differs depending on your workstation.

    ■   If you have an O2 R5000 class workstation, go to "Removing the PCI Tray: O2 R5000 Class Workstations" on page 7.

    ■   If you have an O2 R10000 class workstation, go to "Removing the Face Plate and PCI Tray: O2 R10000 Class Workstations" on page 11.

Removing the PCI Tray: O2 R5000 Class Workstations

Follow these steps to remove the PCI tray from the system module.
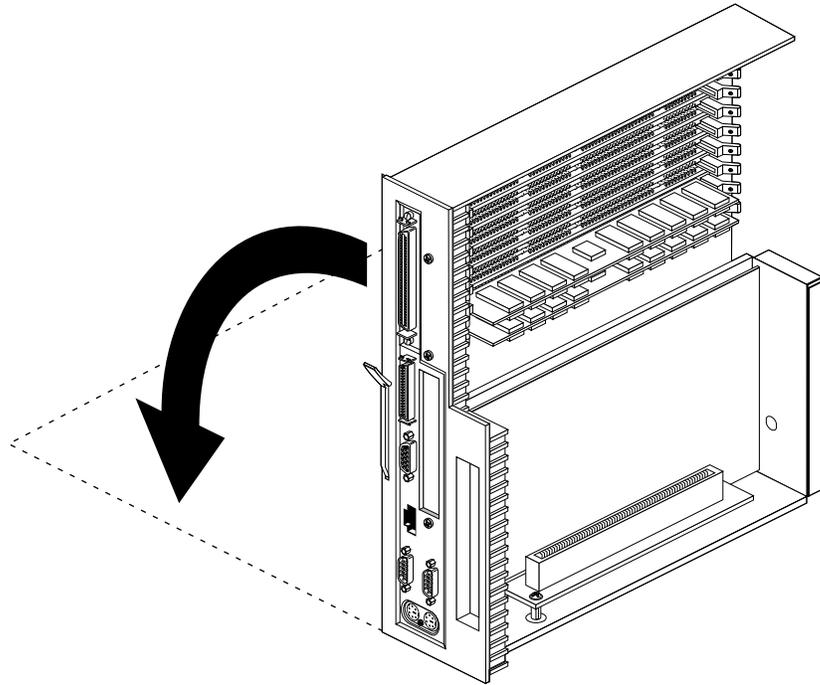
Figure 1-5   Laying the System Module Flat

1.   Lay the system module on a clean, flat surface, such as your desktop (Figure 1-5).
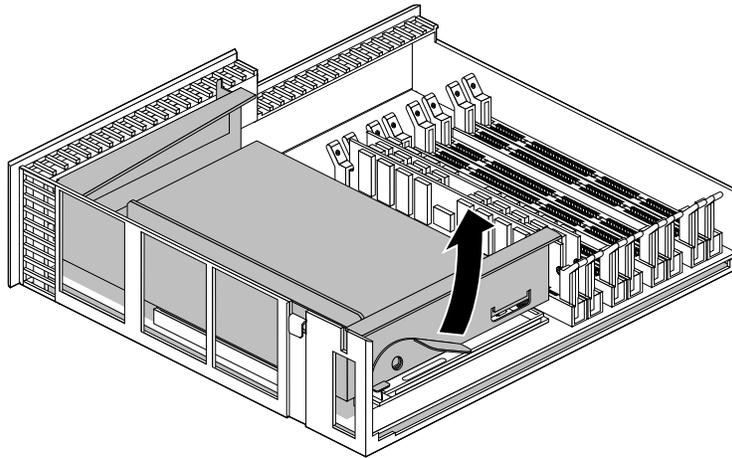
Figure 1-6   Releasing the PCI Tray

2. Release the PCI tray by pushing up the lever on the side (Figure 1-6). The tray pops up.

    Note: If a PCI board is installed in the tray, do not remove it from the tray. However, disconnect any cables attached to the PCI board.
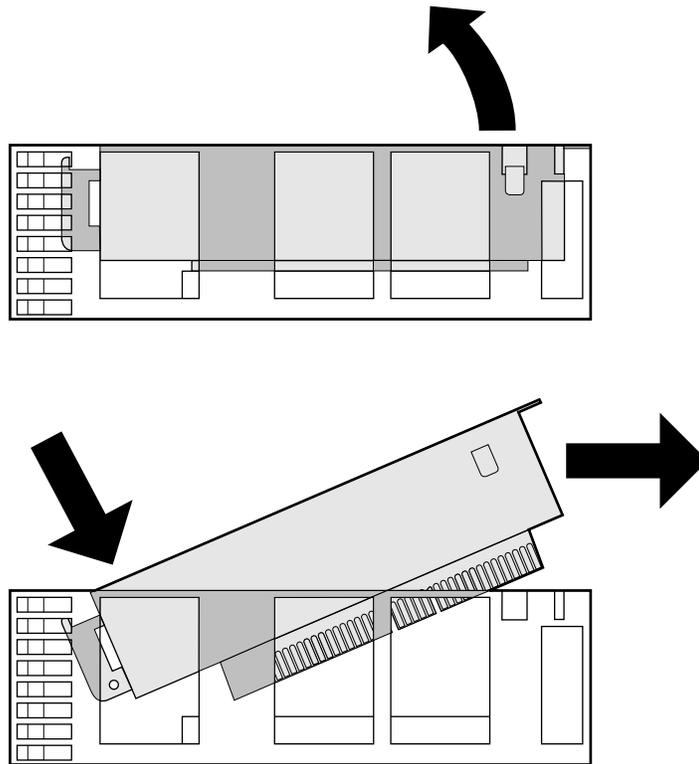
Figure 1-7   Removing the PCI Tray from the System Module Viewed from the Side

3. Push down slightly on the rear of the PCI tray to remove it from the system module (Figure 1-7).
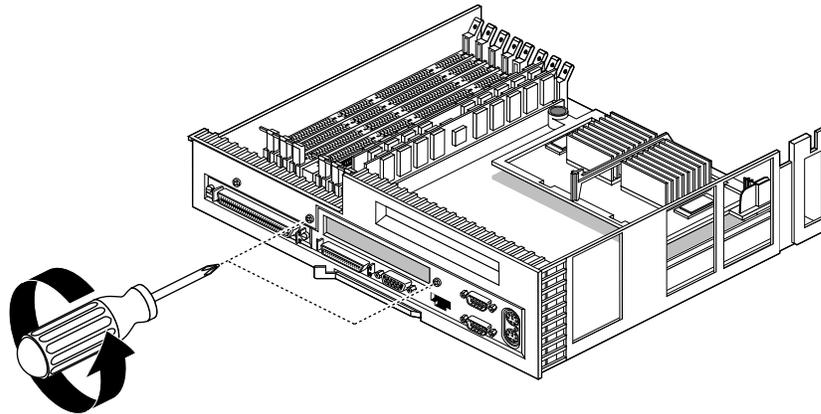
Figure 1-8   Removing the Filler Panel: O2 R5000 Class Workstation

4. If there is a filler panel covering the opening for the adapter board's external connector, remove it as follows:

    ■   Use a Phillips screwdriver to remove the two screws that hold it (Figure 1-8).

    ■   Push the filler panel inward.

    ■   Remove the filler panel and save it. If you remove the flat panel adapter board and do not replace it, you must reinstall the panel.

5. Go to "Installing the Board: O2 R5000 Class and O2 R10000 Class Workstations" on page 14.

Removing the Face Plate and PCI Tray: O2 R10000 Class Workstations

Follow this procedure to remove the PCI tray from an O2 R10000 class workstation.
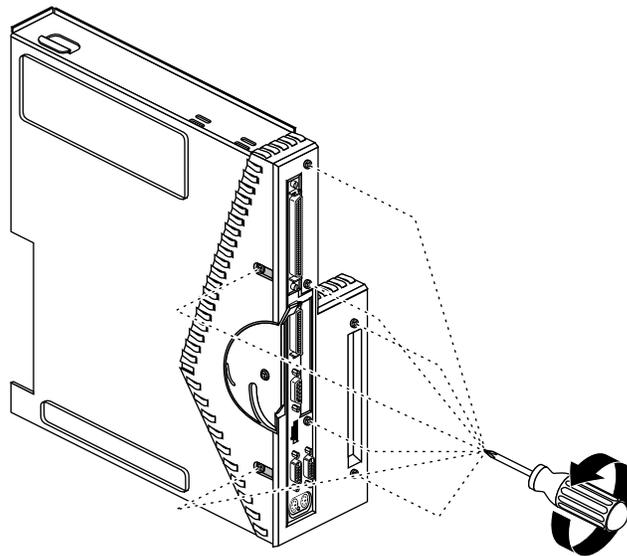
Figure 1-9   Removing the Screws from the Face Plate: R10000 Class Workstation

1.   Remove the face plate.

   ■   Use the Phillips screwdriver to remove five screws from the rear and two screws from the underside of the system module (Figure 1-9).

   Caution: From the underside, remove only two screws. Do not remove the third screw that attaches the system module lever to the face plate.
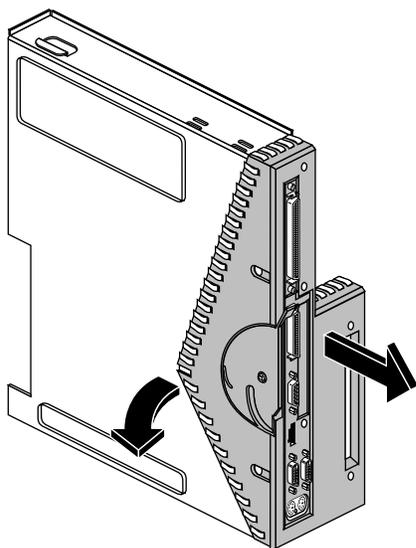
Figure 1-10   Removing the Face Plate: O2 R10000 Class Workstation

■   Remove the plastic and metal face plate by grasping it where the plastic comes to a "V" and pulling it outward (Figure 1-10).
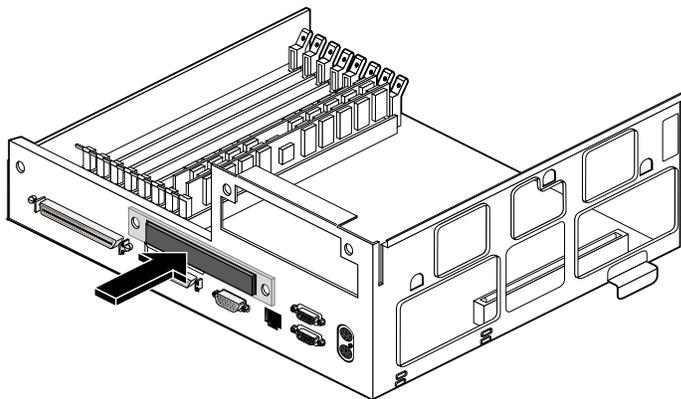
Figure 1-11   Removing the Filler Panel: O2 R10000 Class Workstation

2.   Remove the filler panel covering the opening for the adapter board's external connector. It should pop out when you push on it (Figure 1-11).
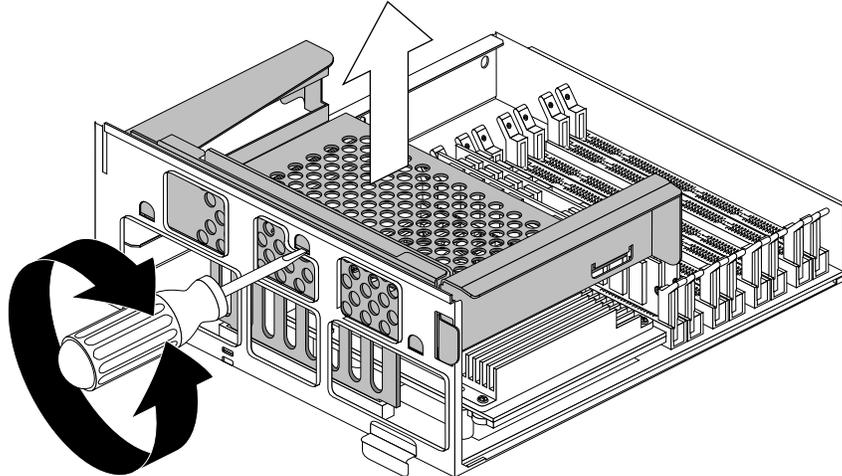
Figure 1-12   Removing the PCI Tray

3. Remove the PCI tray from the system module.

    Note: If a PCI board is installed in the tray, do not remove it from the tray. However, disconnect any cables attached to the PCI board.

    ■   Insert a flat-head screwdriver (the screwdriver that comes with the shipment is reversible) in the small opening shown in Figure 1-12. Use a twisting motion to release the PCI tray connector from the slot on the system module. Then use an up and down motion to release the PCI tray.

    ■   Pull the PCI tray straight up to remove it and set it aside.

4. Go to "Installing the Board: O2 R5000 Class and O2 R10000 Class Workstations" on page 14.

Installing the Board: O2 R5000 Class and O2 R10000 Class Workstations

Follow these instructions to install the board. The illustrations in this section show an R10000 class workstation. The procedure is the same for an R5000 class workstation.
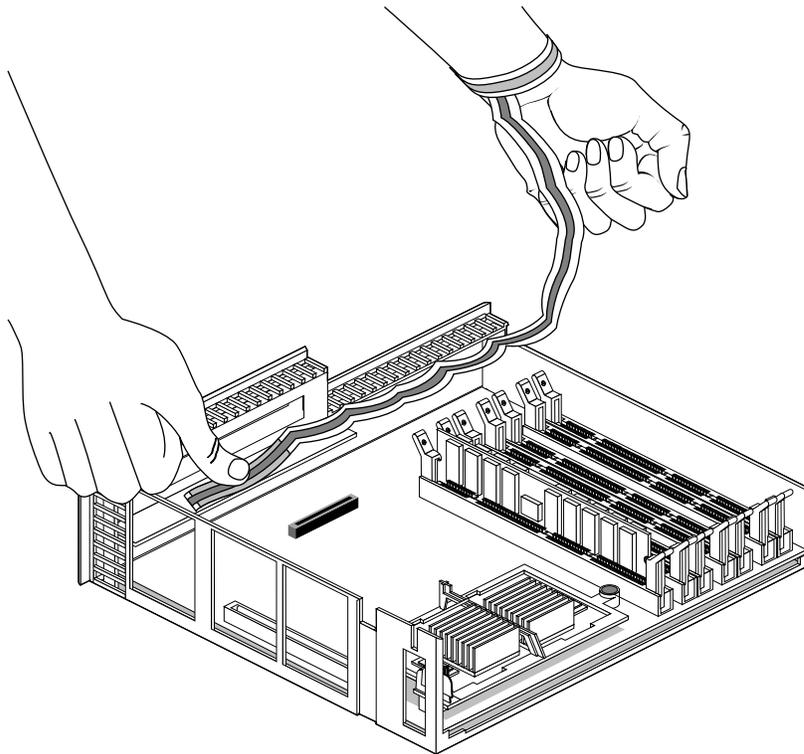
Figure 1-13   Attaching the Wrist Strap

1. Before touching any of the components, ground yourself to a metal part of the system module with a wrist strap (Figure 1-13).

    ■   Wrap the first two folds of the strap around your wrist.

    ■   Peel the liner from the copper foil at the opposite end.

    ■   Attach the copper foil to the metal part of the chassis.
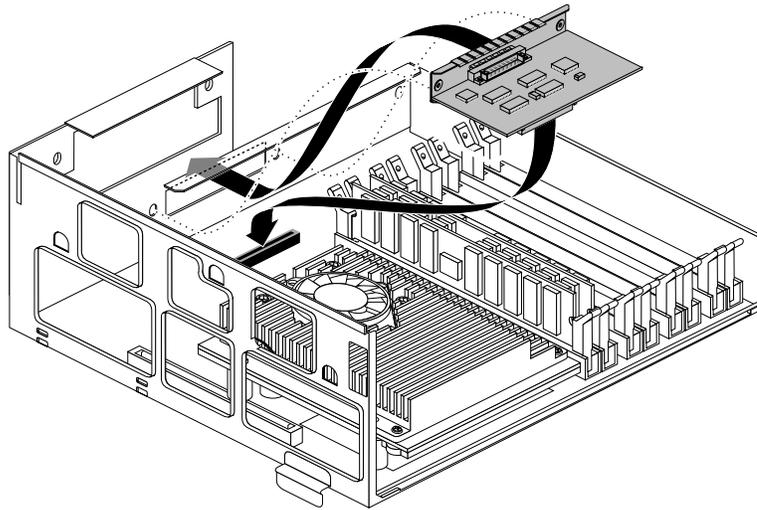
Figure 1-14   Positioning the Flat Panel Monitor Adapter Board

2. Align the board as follows:

    ■   Tilt the board at a steep angle and lower it until the board's external connectors are opposite the opening on the backplane.

    ■   Rotate the board downward until it is as flat as possible while pushing toward the opening to align the connector.
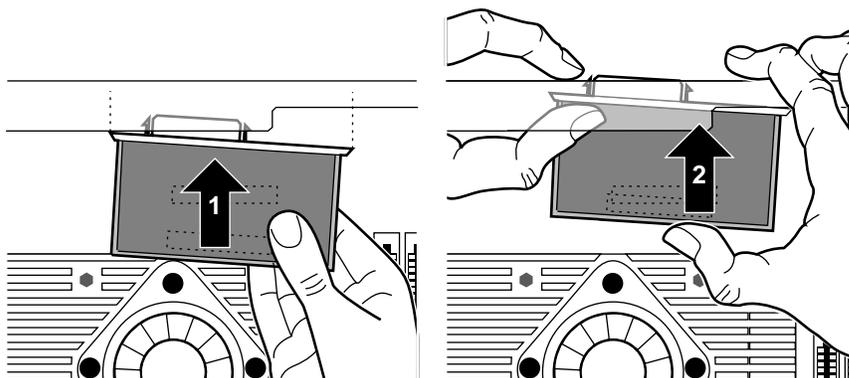
Figure 1-15   Aligning the Flat Panel Monitor Adapter Board

3. As shown in Figure 1-15, push the left side of the board (1), then the right (2),
    toward the rear of the system module so that the board's I/O connector goes
    through the slot and the connector underneath is aligned over the socket on the
    system board.

4. Look at the rear panel from the outside to align the screw holes on the panel with
    the screw holes on the board.
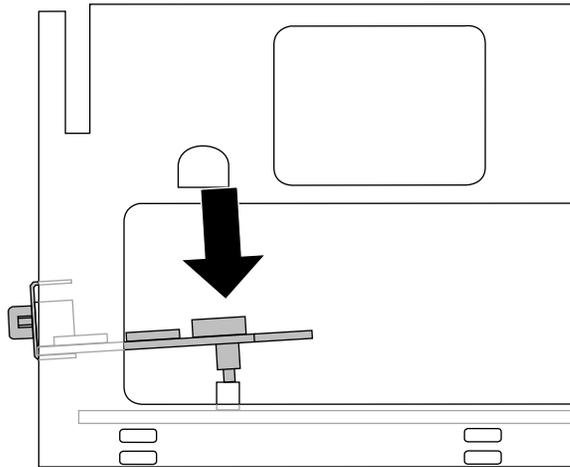
Figure 1-16   Seating the Flat Panel Monitor Adapter Board, Viewed from the Side

5. Once the connector is aligned in the opening, look beneath the board at the system connector. It will probably not be aligned yet over the slot. Push the board toward the rear panel until the system connectors are aligned.

6. Push down firmly to seat the board in the socket. You should hear a muffled click as it seats. Look from the side to make sure it's seated all the way.

7. Remove the wrist strap.

8. Follow the path for your workstation:

    •   For R5000 class workstations, go to step 9.

    •   For R10000 class workstations, go to "Completing the Installation: O2 R10000 Class Workstations" on page 22.
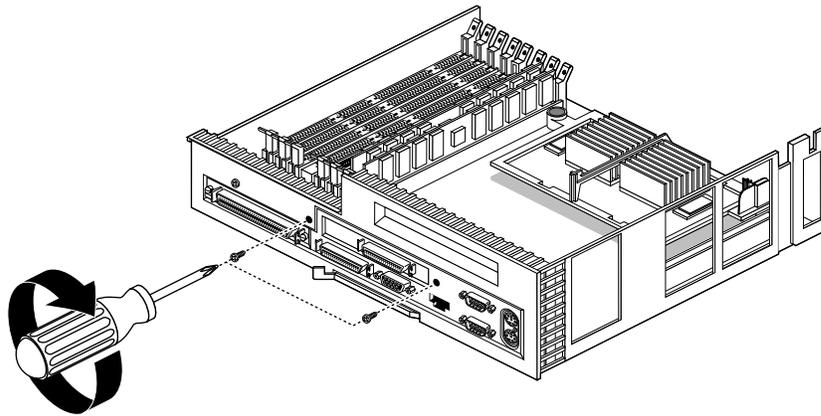
Figure 1-17   Securing the Flat Panel Monitor Adapter Board: O2 R5000 Class Workstations

9. Secure the Flat Panel Monitor adapter board by replacing the screws, as shown in Figure 1-17.

10. To reinstall the PCI tray, go to "Reinstalling the PCI Tray: O2 R5000 Class Workstations" on page 19.

Reinstalling the PCI Tray: O2 R5000 Class Workstations

Follow these steps to reinstall the PCI tray in the O2 R5000 class workstation.
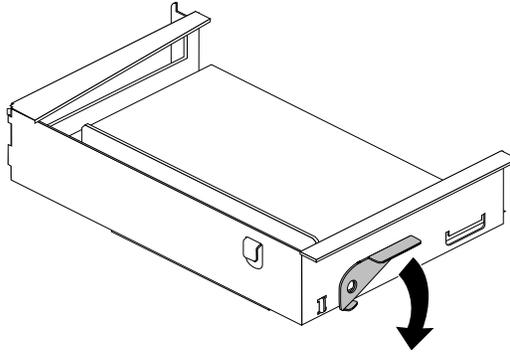
Figure 1-18   Returning the Lever to the Starting Position

1.   Push the PCI tray lever to return it to its starting position (Figure 1-18).
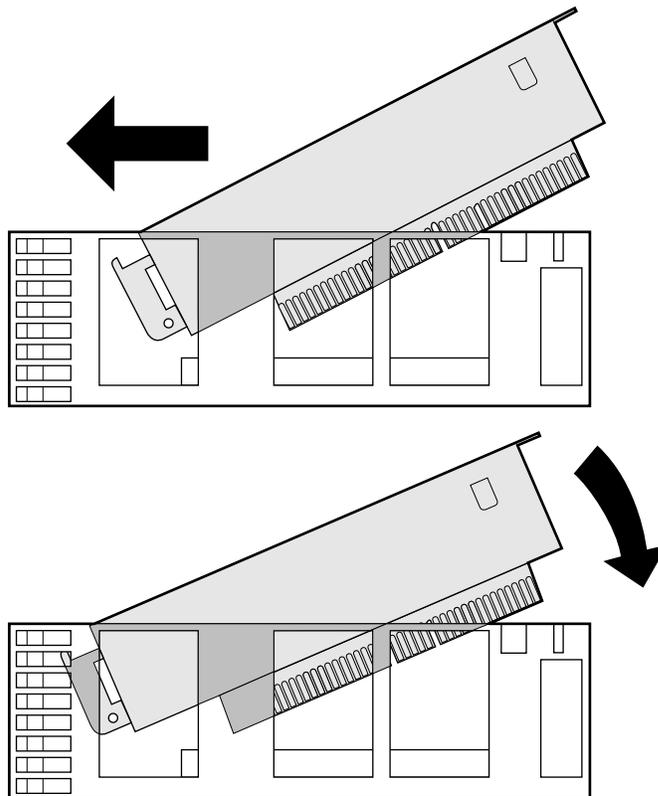
Figure 1-19   Replacing the PCI Tray in the System Module Viewed from the Side

2. Reinstall the PCI tray in the system module (Figure 1-19).

   ■   Engage the hinge on the PCI tray in the slot on the system module.

   ■   Lower the tray, pushing toward the back of the module as you do this.

   ■   Align the gold-colored PCI edge connector with the slot on the system board.
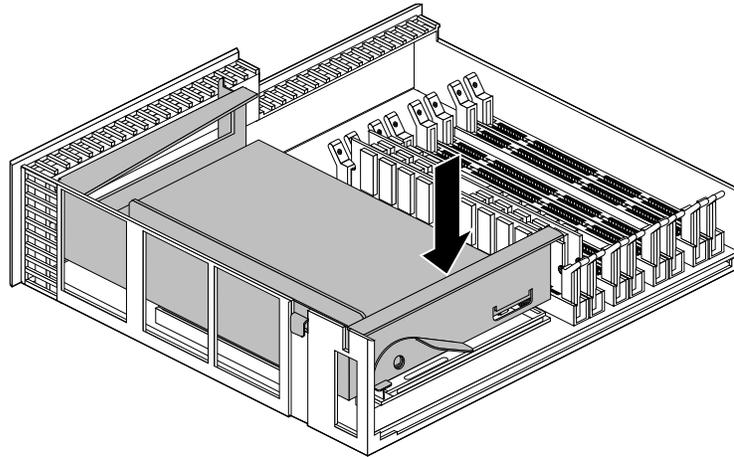
Figure 1-20   PCI Tray Seated Correctly

3. Push the tray down firmly until it is completely seated. You hear a click as it seats (Figure 1-20).

    Caution: The system module cannot slide back into the chassis if the PCI tray is not seated completely.

4. Go to "Reinstalling the System Module" on page 25.

Completing the Installation: O2 R10000 Class Workstations

On an R10000 class workstation, follow these steps to replace the PCI tray in the system module.
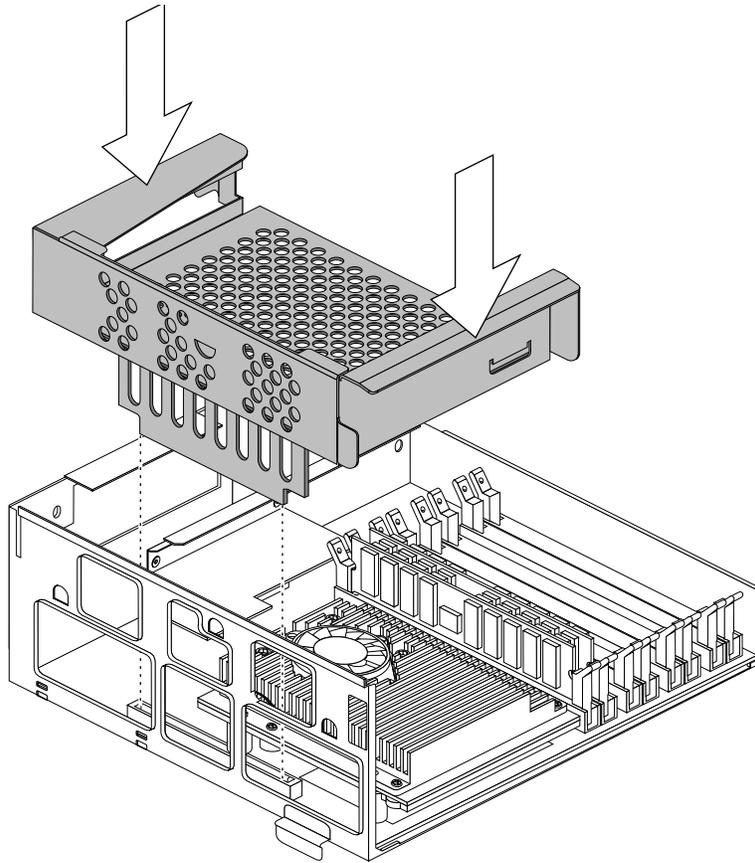
Figure 1-21   Replacing the PCI Tray in the System Module

1. Install the PCI tray (Figure 1-21).

    ■   Lower the PCI tray, engaging it on the tab on the side of the system module.

    ■   Insert the PCI connector beneath the tray into the slot on the system module.

    ■   Once the connector is aligned, push down firmly until it is completely seated.

Note: The system module cannot slide back into the chassis if the PCI tray is not seated completely.
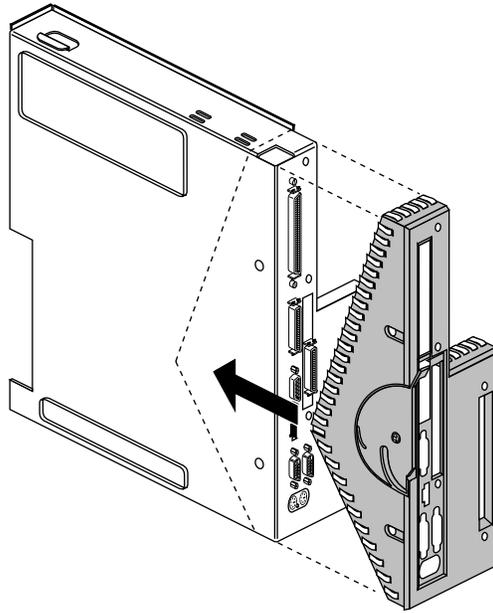
Figure 1-22   Replacing the Face Plate

2. Replace the plastic and metal face plate by sliding it onto the system module, while at the same time lifting the plastic at the "V" to snap it in place. When properly seated, the underside of the faceplate is flush to the module and the screw holes are aligned (Figure 1-22).
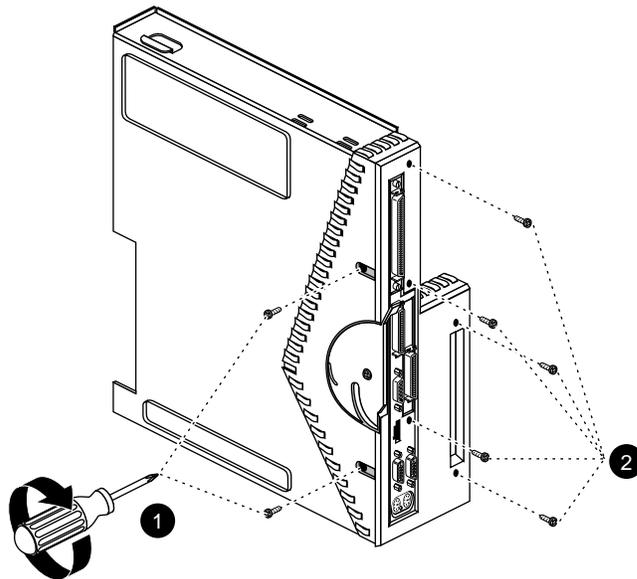
Figure 1-23   Replacing Screws on the Face Plate

3. Use a Phillips screwdriver to insert and tighten the screws in the locations shown
    (Figure 1-23).

4. Go to "Reinstalling the System Module" on page 25.

Reinstalling the System Module

Note: The illustrations in this section show an O2 R5000 workstation. Installing the system module is the same for an O2 R10000 class workstation.
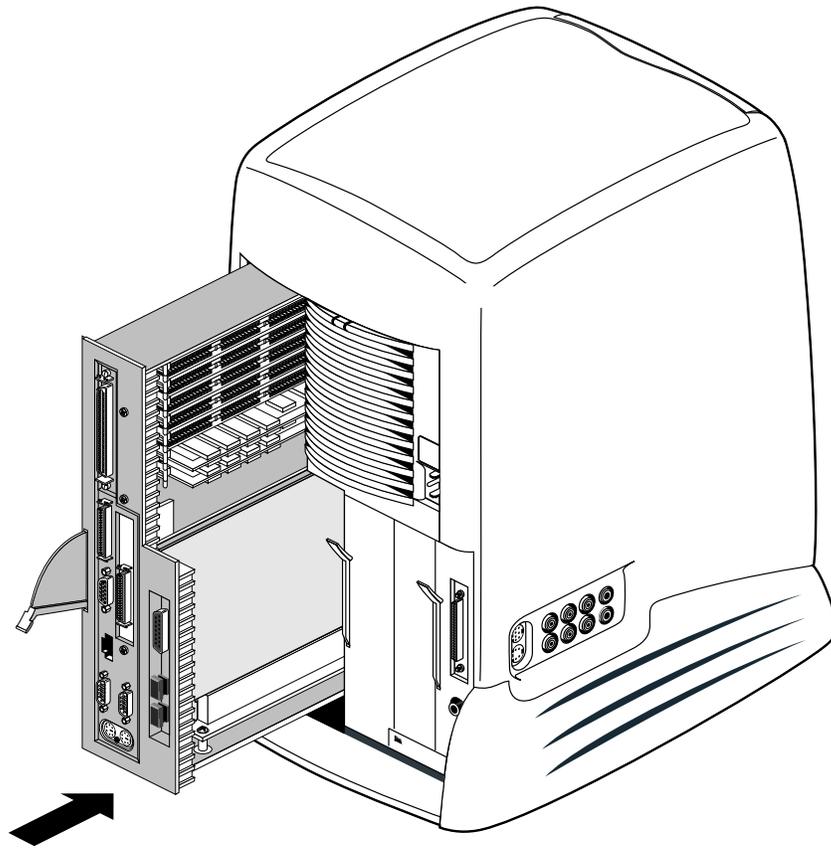
Figure 1-24   Reinstalling the System Module in the Chassis

1.   Slide the system module into the chassis until the lever engages (Figure 1-24).
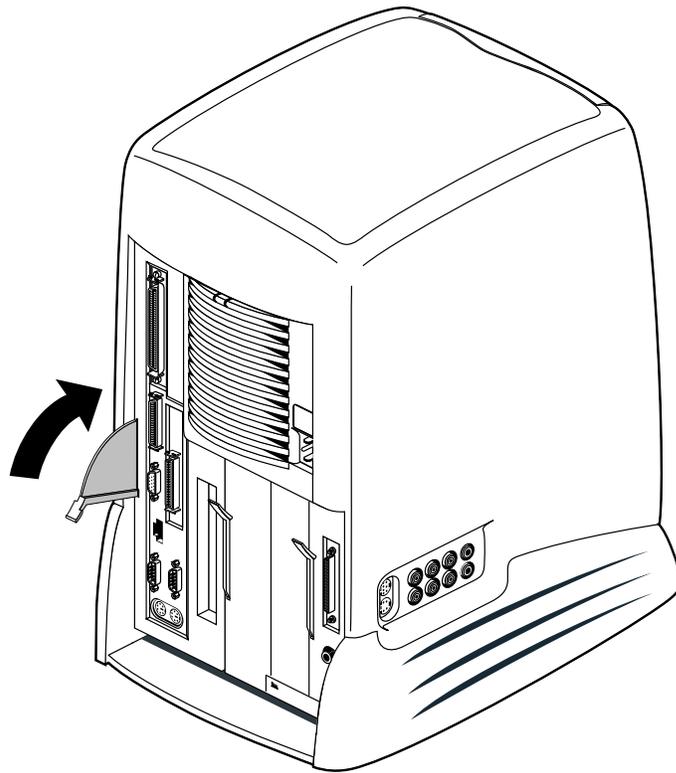
Figure 1-25   Securing the System Module in Place

2. Push the lever up to lock the module in place (Figure 1-25). If the module is installed correctly, the lever is all the way up and the system module is flush with the system drive module and other modules.

3. If you received a system upgrade label, tilt the O2 carefully and place it underneath the chassis. Do not cover the original label.
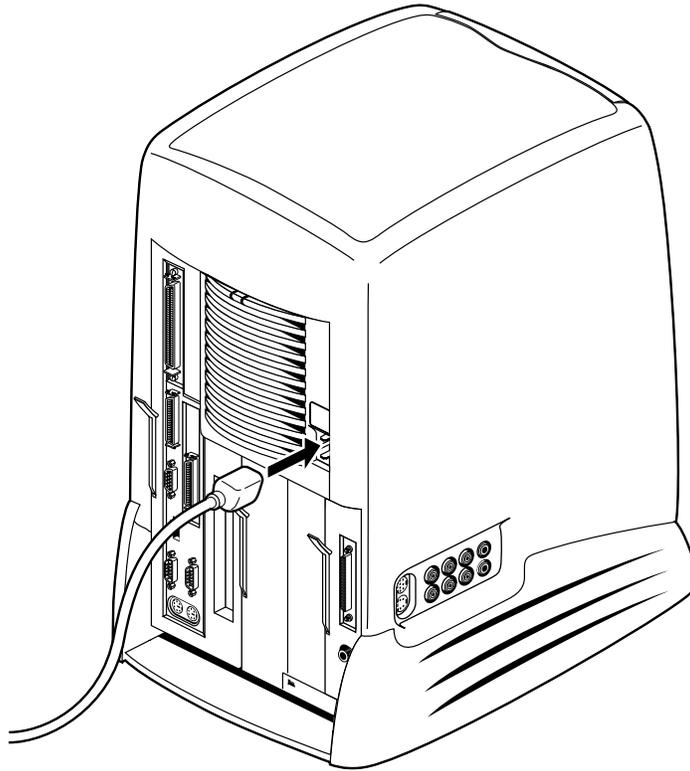
Figure 1-26   Connecting the Power Cable

4. Reconnect the power cable and any other cables you removed (Figure 1-26) except for the monitor cable.

5. You are now ready to connect the 1600SW Flat Panel Monitor to the O2 workstation.

Connecting the Flat Panel Monitor to the O2 Workstation

Follow these steps to connect the Flat Panel Monitor to the O2 workstation:
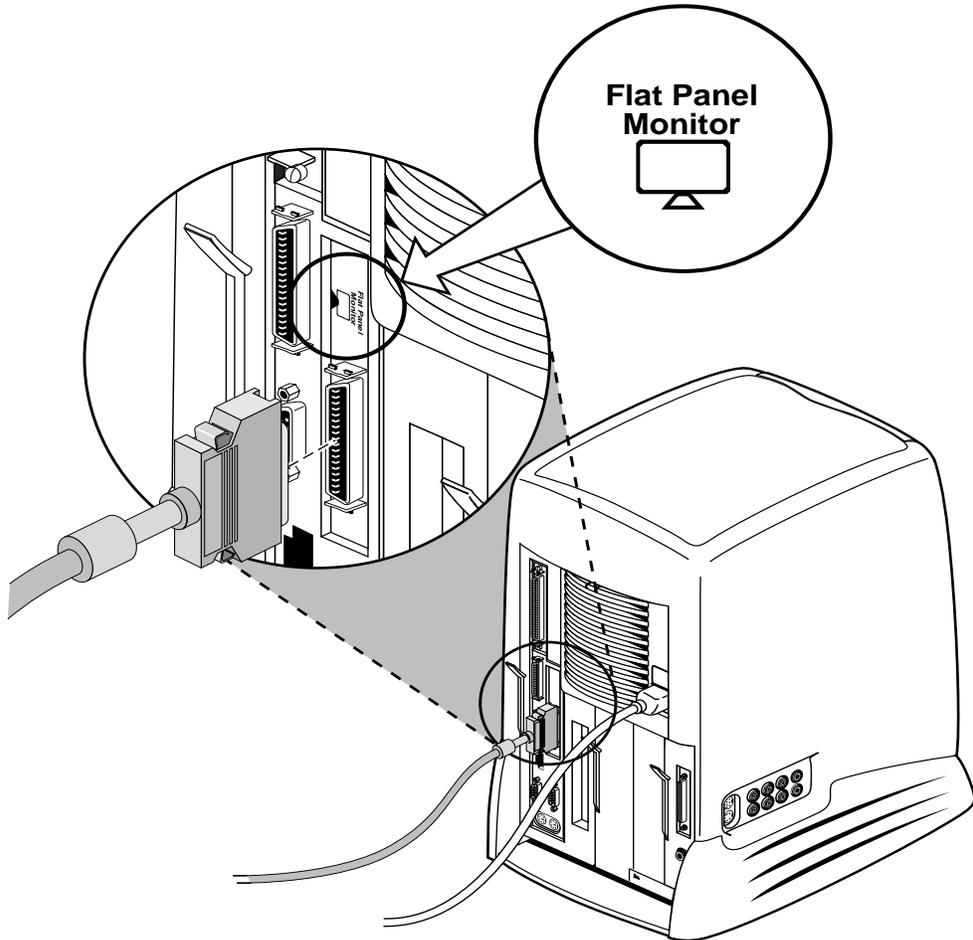
Figure 1-27   Attaching the Interface Cable to the Adapter Board

1. If you have not done so already, unpack the Flat Panel Monitor from its shipping container.

2. *Optional*: If you wish to mount the Flat Panel Monitor on a mounting arm, do so now. Follow the instructions in the *Silicon Graphics 1600SW Flat Panel Monitor Owner's Guide* to remove the monitor from its pedestal.

3. Place the monitor in the desired location.

4. Locate the interface cable and attach it to the flat panel board's connector, as shown in Figure 1-27.

    Caution: The flat panel adapter board's connector looks the same as the one above it. Be sure to connect the interface cable to the correct connector.

5. Connect the Flat Panel Monitor power cables, as described in the *Silicon Graphics 1600SW Flat Panel Monitor Owner's Guide*.

6. Attach any remaining cables, including those for the keyboard, mouse, camera, networking, and so forth.

You are ready to turn on the Flat Panel Monitor and your workstation. Follow the instructions in the *Silicon Graphics 1600SW Flat Panel Monitor Owner's Guide* for using the monitor, including how to turn it on and off, how to adjust it, and how to care for it.

Note: Always have your screen saver and power saving features enabled. Using these features can dramatically prolong the life of the backlights in the Flat Panel Monitor and prevent images from burning into the screen.

Removing the Flat Panel Adapter

Follow these instructions to remove the flat panel adapter board:

1. Turn off the workstation and remove the cables, including the power cable. For an illustration, see "Installing the Flat Panel Monitor Adapter Board" on page 2.

2. Remove the system module and place it on a clean, flat surface. For instructions and illustrations, see "Removing the System Module" on page 3.

3. Remove the PCI tray. Then return to this page.

   ■ For O2 R5000 class workstations, see "Removing the PCI Tray: O2 R5000 Class Workstations" on page 7.

   ■ For O2 R10000 class workstations, see "Removing the Face Plate and PCI Tray: O2 R10000 Class Workstations" on page 11.

4. Before touching any of the components, ground yourself to a metal part of the system module with a wrist strap (Figure 1-13).

   ■ Wrap the first two folds of the strap around your wrist.

   ■ Peel the liner from the copper foil at the opposite end.

   ■ Attach the copper foil to the metal part of the chassis.
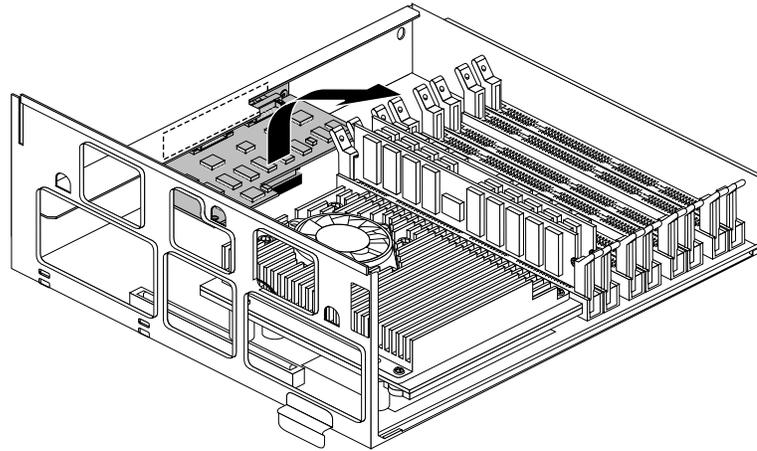
Figure 1-28   Removing the Flat Panel Monitor Adapter Board

5. Grasp the board on either side and gently rock it out (Figure 1-28). Do not exaggerate the rocking motion, or you might bend the pins.

    Note: The illustration shows an O2 R5000 class workstation. The procedure is the same for an O2 R10000 class workstation.

6. If you are installing a different option board, follow the installation instructions that came with it. Otherwise, replace the filler panel that you removed when you first installed the Flat Panel Monitor adapter board.

7. Remove the wrist strap.

8. Replace the PCI tray.

    ■   For O2 R5000 class workstations, see "Reinstalling the PCI Tray: O2 R5000 Class Workstations" on page 19.

    ■   For O2 R10000 class workstations, see "Completing the Installation: O2 R10000 Class Workstations" on page 22.

9. Reinstall the system module, reconnect the power cable, connect any additional cables (such as for the keyboard, mouse, camera, networking, and monitor), and turn on the workstation. See "Reinstalling the System Module" on page 25.

Adjusting Timing Tables and Calibrating Color

Timing tables determine important characteristics that control your 1600SW flat panel monitor. Unlike CRT monitors, the 1600SW flat panel monitor supports only one resolution, 1600 pixels wide by 1024 pixels tall. However, you can adjust the refresh rate of your panel. This is explained in "Adjusting the Flat Panel Monitor's Refresh Rate" below.

This chapter also explains how to calibrate the Silicon Graphics 1600SW flat panel monitor when it is attached to an O2 workstation. See "Calibrating the Flat Panel Monitor With the ColorLock Sensor" on page 37.

Adjusting the Flat Panel Monitor's Refresh Rate

The refresh rate is a measure of the number of times the screen is drawn to the flat panel in one second and it is measured in Hertz (Hz). The default refresh rate for the 1600SW flat panel monitor is 50 Hz. This setting works very well for most applications. If you need to display NTSC video, however, you should use the 60 Hz timing table to ensure the proper NTSC frame rate. The 48 Hz table may be useful for the film industry.

Because the 1600 SW flat panel monitor is an all-digital device, there is no screen flicker visible in any of the timing tables provided. In IRIX 6.5.2 or later, you can change monitor timings using the *Xsetmon* command.

To start *Xsetmon*, follow these steps:

1. From the Toolchest, choose System > Display Properties.

    When *Xsetmon* starts, you see a screen similar to what is shown in Figure 2-1.
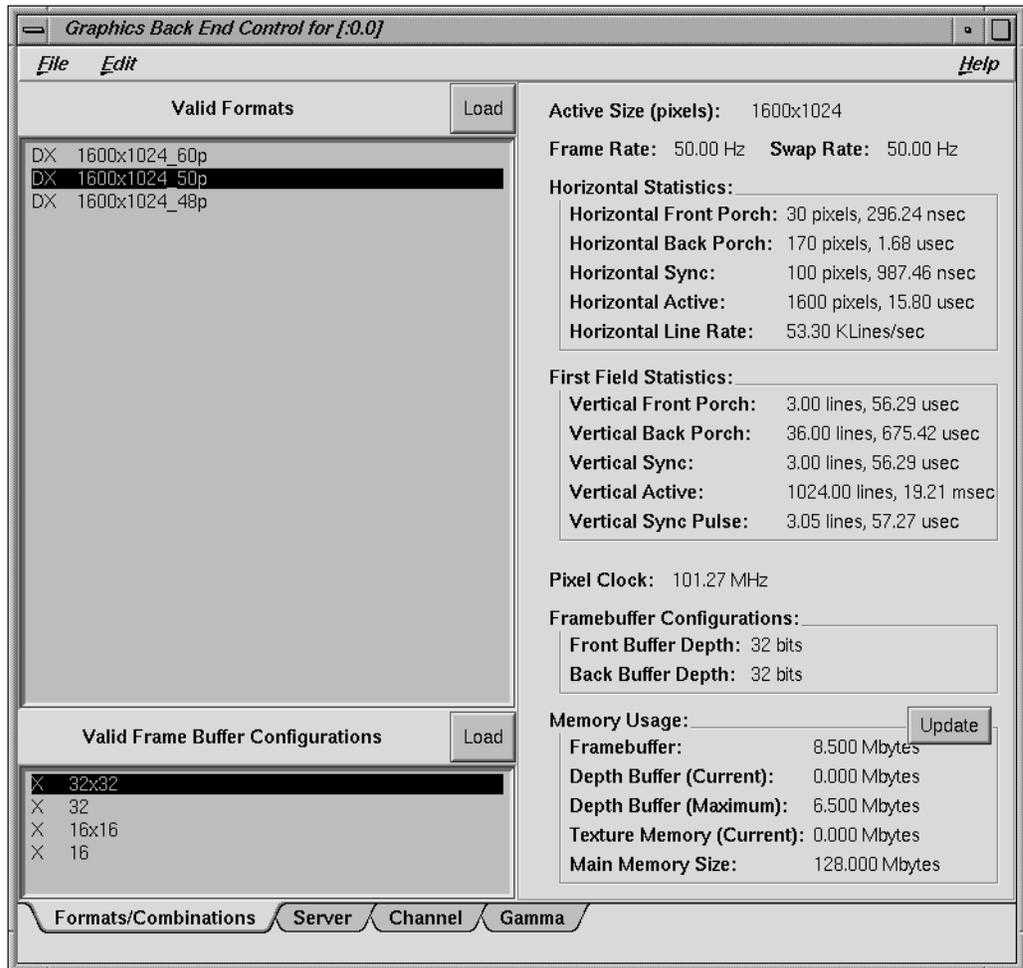
Figure 2-1   Xsetmon Main Screen

2. To change the monitor timing, select one of the timing formats in the Valid Formats window, and click *Load*. Note the following:

    ■   The refresh rate appears in the timing table name following the _ character. For example, 1600x1024_60p indicates a refresh rate of 60 Hz.

    ■   Flat panel settings have a "p" suffix.

    ■   Unlike conventional CRT monitors, the fastest possible timing is not always the most desirable for your application. The flat panel monitor should be flicker-free at any of the timings (48 Hz, 50 Hz, and 60 Hz). The O2 system software default for the 1600SW flat panel monitor is 50 Hz.

    ■   When displaying NTSC video, select the 60 Hz timing table (1600x1024_60p).

Caution: When using 60 Hz timing, change your desktop background to Solid to keep spurious lines from appearing on your screen. These lines are the result of an interaction between the monitor timing and the workstation graphics subsystem, and appear only with complex backgrounds and the 60 Hz timing table. To change your background, from the Toolchest choose Desktop > Customize > Background.

About the Gamma Settings in *Xsetmon*

Do not change the gamma setting of your flat panel monitor with *Xsetmon*. Use the 1600SW Flat Panel's Settings Control Panel to change the gamma, as described in "Changing the Gamma" on page 42.

Using the 1600SW Flat Panel Settings Control Panel

The 1600SW flat panel monitor features ColorLock technology, an integrated color calibration system. Your O2 workstation's system software includes a special control panel with which you adjust color temperature, intensity, and gamma.

If you are not familiar with color calibration software, you may want to skip to the Glossary on page 53, before reading this chapter.

You can adjust various flat panel monitor settings, including the color temperature, intensity (brightness), and gamma with the Flat Panel Settings control panel (Figure 2-2). You can also use the control panel to calibrate your monitor to achieve the most accurate settings possible.

Note: Always use the Screen Saver program with the Power Saver option selected. Using these features dramatically prolongs the life of the backlights in the flat panel monitor and prevents images from burning into the screen.
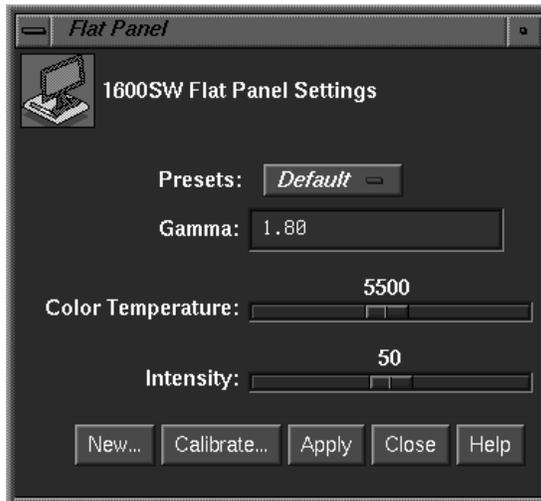
Figure 2-2   1600SW Flat Panel Settings Control Panel

There are several ways to start the Flat Panel Settings control panel (Figure 2-2):

• From the Toolchest, choose Desktop > Customize > Flat Panel.

- From the Toolchest, choose Find > ControlPanels and double-click the fp_1600sw icon.

- In a shell window, enter **`/usr/sbin/flatpanel`**

You may begin adjusting the parameters for gamma, color temperature, and intensity at any time. While calibration with the ColorLock sensor is not required for these adjustments, the ColorLock technology built into your panel works best when you calibrate using the ColorLock sensor. Depending on usage, you should only have to recalibrate approximately once every two months.

In a multi-user environment, each user should calibrate the panel for their environment, particularly if the room lighting or other working conditions differ between users. See "Calibrating the Flat Panel Monitor With the ColorLock Sensor" on page 37. Also, each user account can have a different set of presets. Presets allow you to group favorite combinations of gamma, color temperature, and intensity together for quick adjustments. See "Creating and Saving Presets" on page 43.

Calibrating the Flat Panel Monitor With the ColorLock Sensor

With your adapter kit you received a ColorLock sensor. Calibration with the ColorLock sensor adjusts your settings more accurately, taking into account your panel's age and other environmental factors.

Note: No universal system for color calibration exists, because the human visual system is complex and difficult to model. The 1600SW flat panel monitor received specialized factory calibration during manufacture. With data stored in the panel and ColorLock sensor calibration procedures, you can adjust the color temperature accurately. Additionally, you can achieve precise gamma settings.

Tip: For the most accurate results, choose the color temperature and intensity settings before calibrating. However, you can always adjust these parameters following a calibration.

Tip: To calibrate the flat panel monitor, follow these steps:
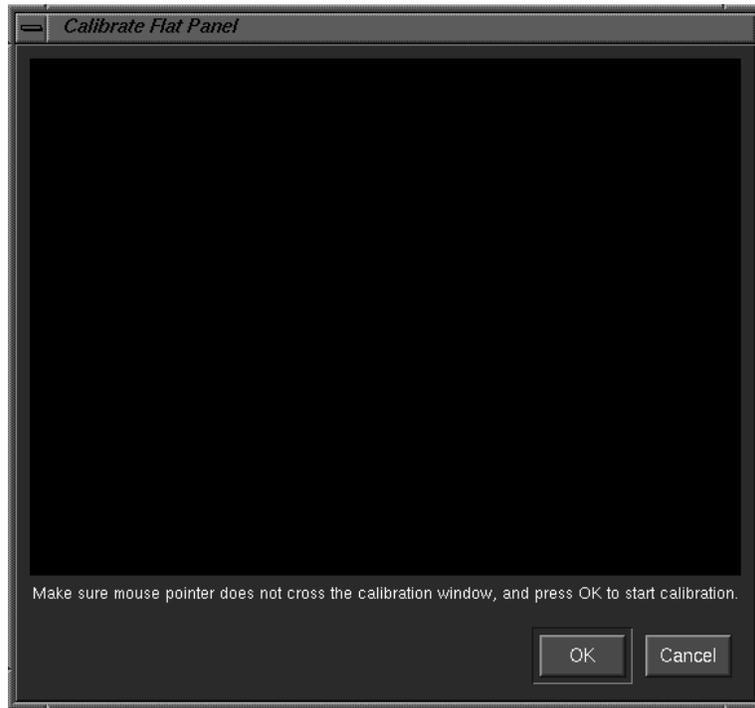
Figure 2-3   Calibrate Flat Panel Window

1.   From the Flat Panel Settings control panel, click *Calibrate*. (See Figure 2-2.) The flat panel calibration window appears, as shown in Figure 2-3.
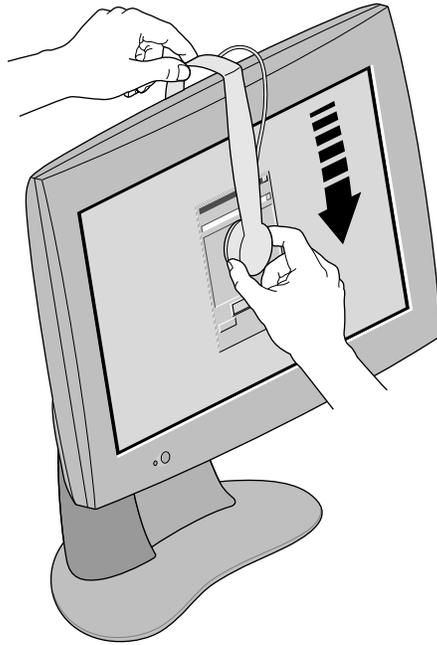
Figure 2-4   Attaching the ColorLock Sensor to the Flat Panel Monitor

2. Attach the ColorLock sensor to the flat panel monitor, as shown in Figure 2-4.

    ■   Use both hands to lay the sensor over the top of the monitor, hooking it over the edge of the frame. Be careful not to scratch the flat panel screen.

    ■   Place the rounded end of the sensor over the center of the Calibration Window. Do not move the calibration window, because the calibration procedure is designed to work best when the window and sensor are at the center of the screen.

    ■   Make sure the sensor snaps into one of the vent holes on the back of your monitor.
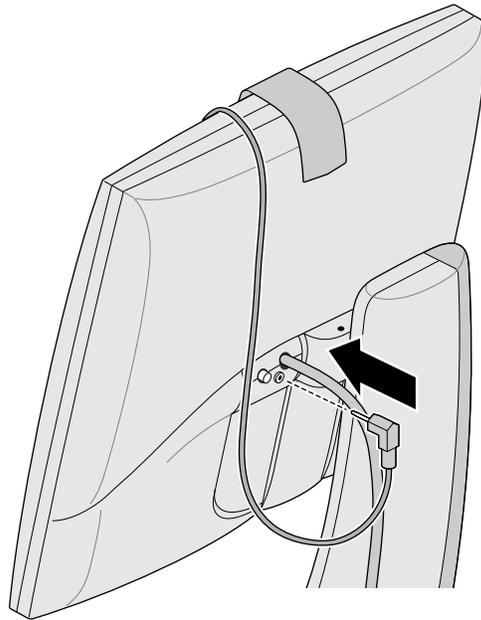
Figure 2-5   Connecting the ColorLock Sensor Cable to the Flat Panel Monitor

3. Plug the sensor cable into the sensor port on the back of the flat panel (next to the power port), as shown in Figure 2-5. The sensor port looks like an ordinary headphone jack.

4. Click *OK* to begin calibrating. The automated procedure displays various colors and diagnostic messages as it progresses. To stop the calibration process, click *Cancel* at any time. When the calibration cycle is complete, the calibration window disappears.

    Note: Although the flat panel monitor's gamma, color temperature, and intensity settings are altered during the automated calibration procedure, your last settings will be restored (with increased accuracy) as soon as the procedure completes.

5. To remove the ColorLock sensor, use both hands. Lift the back of the sensor away from the vent holes with one hand, and lift the front of the sensor away from the flat panel screen with the other hand.

Changing the Color Temperature (White Point)

Color temperature refers to the definition of the flat panel monitor's white point. The definition of the color white is not absolute, and may exist somewhere in color space from red-white to blue-white. You may adjust the white point within this red-blue range.

Your 1600SW flat panel monitor is capable of color temperature adjustments between 5000 degrees and 7000 degrees Kelvin. The ColorLock technology, however, may be able to adjust to a wider temperature range, especially with a new flat panel monitor, or following a ColorLock sensor calibration.

To change the color temperature (white point) of the monitor, in the 1600SW Flat Panel Settings window, move the Color Temperature slider right or left. The color temperature indicated above the slider changes as you move the slider.

You can move the slider in 100-degree increments by clicking on the part of the slider display to the left or right of the slider button (called the "well.")

Changes to the color temperature are visible immediately, but changes are not saved until you click *Apply*. For more information, see "Creating and Saving Presets" on page 43.

Note: Whenever you change the color temperature slider, the intensity slider automatically jumps to 100, because the software automatically picks the brightest intensity available at the selected color.

Changing the Intensity (Brightness)

Intensity specifies the luminance (or brightness) of colors on the flat panel monitor. Intensity is a relative measure and depends on your settings for gamma and color temperature.

To change the intensity (or brightness) of the monitor, use the Intensity slider in the 1600SW Flat Panel Settings window. Moving the slider to the right increases the intensity and to the left decreases the intensity.

Move the slider in 10-unit increments by clicking on the part of the slider display to the left or right of the slider button (called the "well.") Be aware that whenever you change the color temperature, the intensity slider automatically moves up to 100.

The intensity varies between 0 (lowest available) and 100 (maximum available). Changes to the intensity are visible immediately, but are not saved until you click *Apply*. See "Creating and Saving Presets" on page 43.

Note: You may notice that maximum intensity varies in overall brightness depending upon color temperature selection. This is completely normal.

Changing the Gamma

The gamma of a display describes the relationship between the video input signal level and the light output or intensity displayed on the monitor. The 1600SW flat panel monitor has a native (or uncorrected) gamma value of 1.8. Based on your work environment and how you use your monitor, you may want to choose a different gamma value. The gamma setting can be varied between 1.0 and 3.0.

Caution: Use only the Flat Panel Settings control panel to change the gamma, as described below. Do not use *Xsetmon* or the IRIX *gamma* command.

To change the gamma of the 1600SW flat panel monitor, follow these steps:

1. In the 1600SW Flat Panel Settings control panel, enter the desired gamma value in the selection box.

2. Highlight the existing value and type in a new value.

3. Click *Apply* to see the effect of the gamma change and to save the change to the current preset. See "Creating and Saving Presets" on page 43.

   The gamma setting adjusts desired (or system) gamma. See the Glossary on page 53 for further explanation.

Creating and Saving Presets

Each user account on a multiuser workstation can have a different set of flat panel monitor presets. Presets are stored in *$HOME/.Sgiresources*.

To create a preset of various color settings, follow these steps:

1. In the 1600SW Flat Panel Settings control panel, click *New*.

2. In the dialog box, enter the name of your preset and click *OK*.

3. Make any changes to the gamma, color temperature, and intensity.

4. Click *Apply* to save the changes to your preset.

Notice that your preset is now visible in the list of presets in the settings control panel. The preset name that is active at the time you click *Close* is selected the next time you use the control panel. To load a preset automatically whenever you log in, see "Loading Presets Automatically."

Note: You may only create unique preset names. If you enter an existing preset name in the New Preset dialog, you are asked to choose another preset name. Only alphabetic characters are allowed; other characters are removed.

Loading Presets Automatically

Each user account on a multiuser workstation can be set up to load a preset automatically upon beginning an X session. To enable this feature, place the following line in the *$HOME/.sgisession* file of each user account on the system:
```
/usr/sbin/flatpanel -nogui
```

The last active preset will be loaded whenever you log into an account configured in this manner. If you do not add the above line to each user's *$HOME/.sgisession* file, you will need to run the 1600SW flat panel monitor Settings control panel manually with the start of each new X session.

Removing Presets

To delete a preset, edit the *$HOME/.Sgiresources* file and remove all references to that preset name. To return to factory settings, remove all references to the preset *Default*.

Caution: The *.Sgiresources* file may contain settings from other applications. Use care when deleting this file entirely, as you may affect other programs.

Using Screen Savers

You should always use the Screen Saver program with the Power Saver option selected to prolong the life of your backlights and reduce the need for frequent recalibration with the ColorLock sensor.

Caution: The O2 workstation's PROM has no screen saver or power saver function. If you plan to leave the O2 PROM running for an extended period of time, be sure to turn off the 1600SW flat panel monitor. For example, you might start a miniroot installation, and leave it running overnight.

Note: The login screen saver is not affected by the Screen Saver settings of any user including *root*. It is recommended that you edit the file */var/X11/xdm/Xlogin*. Look for the line that includes the command

```
if [ -x /usr/bin/X11/xset ] ; then
/usr/bin/X11/xset s [seconds] [seconds]
fi
```

Alter both arguments in the second line to one-half the values shown. For example,

```
if [ -x /usr/bin/X11/xset ] ; then
/usr/bin/X11/xset s 600 1200
fi
```

becomes

```
if [ -x /usr/bin/X11/xset ] ; then
/usr/bin/X11/xset s 300 600
fi
```

See the xset man page for more details.

Troubleshooting, Technical Specifications, and Regulatory Information

The following topics are covered in this chapter:

- "Troubleshooting" on page 45
- "Product Support" on page 49
- "Returning Parts" on page 49
- "Technical Specifications" on page 50
- "Manufacturer's Regulatory Declarations" on page 52

Troubleshooting

This section provides some troubleshooting tips.

In addition, the troubleshooting chapter in your *O2 Workstation Owner's Guide* provides helpful tips for the O2 workstation.

Verifying the Hardware Installation

If you're encountering problems with the flat panel monitor, first check that the board shows up in the hardware inventory. You may have to reattach your CRT monitor or log in via the network if the flat panel monitor is not working correctly.

At a UNIX shell prompt, enter
hinv

Look for the following entry:

```
1600SW Flat Panel adapter board and display.
```

If the entry is shown, the 1600SW flat panel adapter board is installed and recognized by the system. If the entry is not shown, read through the troubleshooting tips in Table 3-1 to help you isolate the problem.

Table 3-1   Troubleshooting Tips

Symptom	Possible Cause
1600SW Flat panel monitor does not turn on as the system boots.	Check the condition of the 1600SW status LED. If blinking yellow, your O2 workstation has not detected the panel. Check that all the cables are connected securely. If you recently upgraded to 6.5.2, the software installation may have failed. Check that the 1600SW flat panel monitor adapter board is installed correctly in the O2.
1600SW flat panel monitor and adapter board do not show up in *hinv*.	The board is either not installed correctly, or is faulty. Repeat the installation steps, making sure you press the board all the way in. You should hear a muffled click as it is seated. If you recently upgraded your software from 6.5 or 6.5.1 to 6.5.2, the software installation may have failed. In rare circumstances, the interface cable to the flat panel monitor may be bad. If reseating the board and reinstalling the software doesn't solve the problem, the board may be faulty. Call your service representative.
Lines appear across the 1600SW flat panel monitor screen.	This may be a result of an interaction between the 1600SW flat panel monitor timing settings and the workstation graphics subsystem. To fix the problem, either use a monitor timing other than 60 Hz, or change your desktop background to a Solid background. See "Adjusting the Flat Panel Monitor's Refresh Rate" on page 33 for details.
CRT monitor attached into the workstation at the same time as the 1600SW flat panel monitor has poor display, with flickering and distorted picture.	The 1600SW flat panel monitor was not designed to be used simultaneously with a CRT monitor attached to the same graphics subsystem. Although it can be made to work, the CRT monitor will flicker in most cases.
1600SW Settings Control Panel fails to load.	Try running /usr/sbin/flatpanel from a shell and note any error messages. If you see an error message "No Factory Calibration," call your service representative.

Table 3-1 (continued)   Troubleshooting Tips

Symptom	Possible Cause
Calibration procedure stops suddenly.	Look for any error messages. Be sure that the ColorLock sensor is properly connected and placed on the screen before beginning calibration. Try restarting calibration again. See also the next item.
The 1600SW flat panel monitor does not respond to color temperature or intensity adjustments, or calibrations fail.	Make sure your system software is properly installed. Turn off the 1600SW flat panel monitor, disconnect it from the O2, and remove the DC power cord. Wait a few seconds and reconnect the cables and switch on the panel. Then reboot the O2. If the problem persists, call your service representative.
Color temperature adjustments are not smooth or seem inaccurate.	Recalibrate the 1600SW flat panel monitor using the ColorLock sensor. Make sure that the ColorLock sensor is placed properly on the screen. See "Calibrating the Flat Panel Monitor With the ColorLock Sensor" on page 37

Running Confidence Tests

Confidence tests are available for the 1600SW flat panel monitor and adapter board. The confidence test steps you through several screens that display a variety of colors and patterns. Follow the on-screen prompts for altering and testing the backlighting and other options.

Note that the confidence tests require you to inspect the display visually. In most situations the tests do not indicate errors.

To start the texts, follow these steps:

1. Choose System > Confidence Tests from the Toolchest.

2. You see the Confidence Tests window, which should look similar to Figure 3-1.
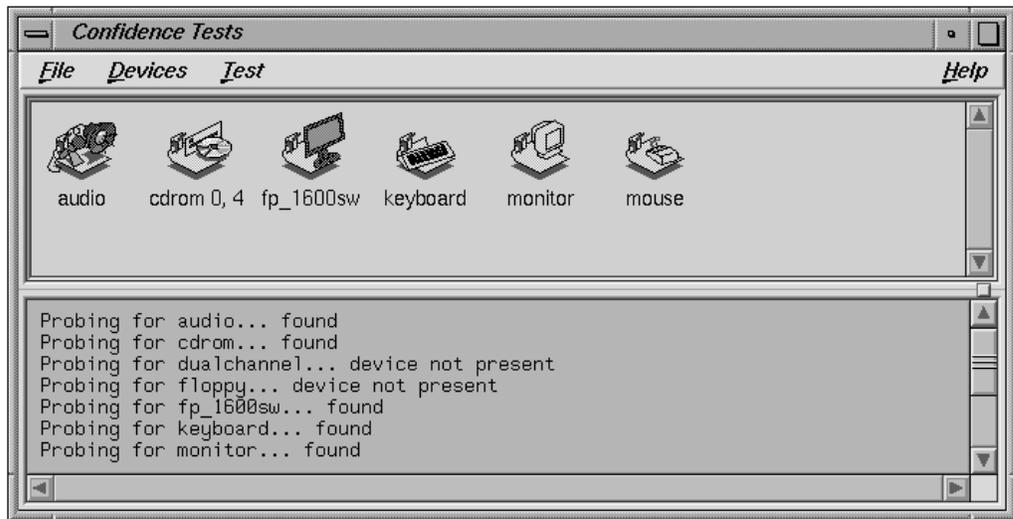
Figure 3-1   Confidence Tests Window

3. To run the confidence test, double-click the fp_1600sw icon.

Product Support

The O2 workstation is designed so that you may maintain and repair the workstation without the help of a trained technician. Contact your Silicon Graphics subsidiary or authorized distributor for information about product support.

Silicon Graphics, Inc., provides a comprehensive range of product support for its products. If you are in North America and would like support for your Silicon Graphics supported products, contact the Technical Assistance Center at 1-800-800-4SGI or your authorized service provider. If you are outside North America, contact the Silicon Graphics subsidiary or authorized distributor in your country.

Returning Parts

To return any part, use the packaging materials and box that came with your replacement part. For product support information, see the section, "Product Support."

Technical Specifications

The cable pinouts for the 1600SW flat panel monitor adapter are shown in Table 3-2.

Table 3-2   Flat Panel Monitor Adapter's Pinouts

Pin	Assignment	Pin	Assignment
1	ODD0-	19	ODD3-
2	ODD0+	20	ODD3+
3	ODD1-	21	ODD_CLK-
4	ODD1+	22	ODDCLK+
5	ODD2-	23	12_SCL
6	ODD2+	24	GND
7	RES	25	12C_SDA
8	RES	26	12C-VCC
9	GND	27	12C-VCC
10	GND	28	12C-VCC
11	RES	29	12C-VCC
12	RES	30	12C-VCC
13	EVEN0-	31	LVDSEN
14	EVEN0+	32	GND
15	EVEN1-	33	EVEN_CLK-
16	EVEN1+	34	EVEN_CLK+
17	EVEN2-	35	EVEN3-
18	EVEN2+	36	EVEN3+

The ColorLock technology specifications are shown in Table 3-3.

Table 3-3   ColorLock Technology Specifications

Mechanical (Housing)	
Length	188 mm
Width	50 mm
Depth	60 mm
Material, Color	ABS, Cerulean Blue
Cable length	15 inches
Optical	
Sensor technology	Filtered silicon photodiode
Sensor response	Photopic responsivity
Luminance sensing range	1000 cd/m^2, +/- .02 cd/m^2
Luminance repeatability	+/- 2%, unit to unit
Luminance repeatability	+/- .3%, measurement to measurement
Colorimetric accuracy	+/- .002 xy (based upon panel calibration)
Colorimetric repeatability	+/- .001 xy, measurement to measurement

Manufacturer's Regulatory Declarations

Caution: This device has several governmental and third-party approvals, licenses, and 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.

If you received a system upgrade label, tilt the O2 carefully and place it underneath the chassis. Do not cover the original label.

For regulatory statements for the Silicon Graphics 1600SW flat panel monitor, see the *Silicon Graphics 1600SW Flat Panel Monitor Owner's Guide*. For regulatory statements for the O2 workstation, see the *O2 Workstation Owner's Guide.*

Glossary

color calibration

The process of adjusting a display's output characteristics such that you can reliably set the display's appearance to accepted standards.

color temperature

Definition of a monitor's white point. The definition of the color white is not absolute, and may exist somewhere in color space from red-white to blue-white. Expressed as a number in degrees Kelvin (K), color temperature refers to the amount of light radiated by an object known as a "blackbody" when heated to that temperature. Lower numbers, like 5000K, appear reddish whereas higher numbers, like 7000K, look bluish.

frame rate

The number of times a display's system hardware redraws pixels to the monitor screen in one second, measured in Hertz (Hz). With CRT monitors, low frame rates tend to flicker because the phosphor coating on the inside of the monitor tube decreases in intensity faster than the electron gun can refresh it. Flat panel monitors like the 1600SW, however, are not designed to work this way and therefore avoid flicker problems at all frame rates. Note that the graphics rendering rate is related to frame rate. The O2 workstation automatically adjusts its rendering speed according to the frame rate you choose. Other factors also apply.

gamma

The relationship between the video input signal level and the light output or intensity. CRT monitors have inherent non-linearities in how they display data. The amount of signal sent to the monitor is likely not the same as the amount displayed. For example, a strength 50 signal might be displayed at a level of 25, or a strength 90 signal might be displayed at a level of 30. Such nonlinear response is typical of CRT monitors and is called natural, or uncorrected, gamma. The 1600SW flat panel monitor does not have the inherent non-linearities of CRT technology, however it has a native (uncorrected) gamma setting of 1.8.

Computer system hardware permits gamma adjustment through the gamma Look Up Table (LUT.) The gamma value that a user chooses is called desired (or system) gamma, and the values applied to the gamma LUT are collectively called the correction gamma.

intensity (brightness)

The luminance, or brightness, of colors. The higher the intensity, the more light is radiated from a given surface area. Often this quantity is measured in candelas per square meter (cd/m^2).

luminance

The perceived brightness of a surface. It typically refers to a weighted average of red, green, and blue color values that gives the perceived brightness of the combination. For video systems, luminance is the video signal that describes the amount of light in each pixel.

NTSC

A color television standard or timing format encoding all of the color, brightness, and synchronizing information in one signal. NTSC uses a total of 525 horizontal lines per frame, with two fields per frame of 262.5 lines each. Each field refreshes at 60 Hz (actually 59.94 Hz).

pixel

The smallest unit on the display screen grid that can be stored, displayed, or addressed. A display screen is divided into rows and columns of tiny dots, squares, or cells, each of which is a pixel. The resolution of a picture is expressed by the number of pixels in the display. The higher the number of pixels, the sharper the image.

presets

A way of creating color settings for each user account that can be loaded automatically when starting an X session.

refresh rate

See "frame rate".

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