

O2™ Dual Channel Display Installation Guide

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Contents

List of Figures v

List of Tables vii

Introduction ix

About Dual Channel Display ix

Dual Channel Display Package x

O2 Hardware Information x

Technical Publications Library x

- 1. Installing the Dual Channel Display Option Board** 1
 - Installing the Dual Channel Display Option Board 1
 - Removing the System Module 1
 - Removing the PCI Tray: R5000 Workstations 6
 - Removing the Face Plate and PCI Tray: R10000 Workstations 10
 - Installing the Board: R5000 and R10000 Workstations 13
 - Reinstalling the PCI Tray: R5000 Workstations 17
 - Reinstalling the PCI Tray: R10000 Workstations 20
 - Reinstalling the System Module 23
 - Removing the Dual Channel Display Board 26
- 2. Connecting the Monitors** 29
 - Unpacking the Secondary Monitor 29
 - Connecting Cables to the Monitors in a Side-by-Side Configuration 30
 - Connecting Cables to the Monitors in a Stacked Configuration 31
 - Connecting the Monitor Cables to the O2 Workstation 32
 - Connecting the Power Cables 33

- 3. **Configuring the Dual Channel Display** 35
 - Before Enabling Dual Channel Mode 35
 - Configuring the Mouse for Horizontal Cursor Movement 35
 - Controlling Window Manager Maximize Behavior 36
 - Enabling and Disabling Dual Channel Mode 37
 - Resetting Window Positions 39
 - Moving Windows Between Monitors 42
 - Resizing Windows 42
 - Using a Tablet 43
- 4. **Troubleshooting, Technical Specifications and Regulatory Information** 45
 - Troubleshooting 45
 - Verifying the Hardware Installation 45
 - Product Support 47
 - Returning Parts 47
 - Technical Specifications 48
 - Manufacturer's Regulatory Declarations 49
 - Class A 49
 - Electromagnetic Emissions 50
 - Radio and Television Interference 51
 - Shielded Cables 52
 - Electrostatic Discharge 52
- Index** 53

List of Figures

Figure 1-1	Turning Off the Workstation	2
Figure 1-2	Removing the Power Cable	3
Figure 1-3	Releasing the System Module	4
Figure 1-4	Removing the System Module From the Chassis	5
Figure 1-5	Laying the System Module Flat	6
Figure 1-6	Releasing the PCI Tray	7
Figure 1-7	Removing the PCI Tray From the System Module Viewed From the Side	8
Figure 1-8	Removing the I/O Slot Panel from the R5000	9
Figure 1-9	Removing the Screws From the Face Plate	10
Figure 1-10	Removing the Face Plate from the R10000	11
Figure 1-11	Removing the I/O Slot Panel from the R10000	11
Figure 1-12	Removing the PCI Tray	12
Figure 1-13	Attaching the Wrist Strap	13
Figure 1-14	Positioning the Option Board	14
Figure 1-15	Aligning the Option Board	15
Figure 1-16	Seating the Option Board Viewed From the Side	16
Figure 1-17	Returning the Lever to its Starting Position	17
Figure 1-18	Replacing the PCI Tray in the System Module Viewed From the Side	18
Figure 1-19	PCI Tray Seated Correctly	19
Figure 1-20	Securing the Option Board	19
Figure 1-21	Replacing the R10000 PCI Tray in the System Module	20
Figure 1-22	Replacing the Face Plate	21

Figure 1-23	Replacing Screws on the Face Plate	22
Figure 1-24	Reinstalling the System Module in the Chassis	23
Figure 1-25	Securing the System Module in Place	24
Figure 1-26	Connecting the Power Cable	25
Figure 1-27	Removing the Dual Channel Display Board	27
Figure 2-1	Identifying the Cables	29
Figure 2-2	Placing the Monitors Side by Side	30
Figure 2-3	Placing the Primary Monitor Above the Secondary Monitor	31
Figure 2-4	Connecting the Monitor Cables to the Workstation	32
Figure 2-5	Connecting the Monitors' Power Cables	33
Figure 2-6	Turning On the O2 Workstation	34
Figure 3-1	Horizontal Cursor Movements	36
Figure 3-2	The Xscreen Window	38
Figure 3-3	Overlapping Windows	40
Figure 3-4	Moving Windows Horizontally Between Monitors	42
Figure 4-1	Japan's VCCI Class A Statement	51

List of Tables

Table 4-1	Troubleshooting Tips	46
Table 4-2	Dual Channel Display Pinout Assignments	48
Table 4-3	Class A FCC Declaration of Conformance	49

Introduction

This guide tells you how to install the dual channel display option board in the O2 workstation. It also includes information on using and troubleshooting the dual channel system, and programming notes for developers. The guide is organized as follows:

- Chapter 1 provides installation instructions for the O2 dual channel display option board hardware.
- Chapter 2 tells you how to connect the primary and secondary monitors.
- Chapter 3 tells you how to configure the display.
- Chapter 4 provides troubleshooting information and technical specifications.

About Dual Channel Display

Dual channel capability lets you expand your viewing area by displaying graphics and text on a second monitor.

The dual channel display option board is installed in the digital display adapter slot on your O2 workstation's system board. This is the same slot that's used for the Presenter 1280 flat panel display. The minimum memory needed to run a dual channel display configuration is 64 MB; however, 128 MB is recommended.

The dual channel display option board uses a single framebuffer with the capacity for two vertically oriented, 1280 x 1024 displays, providing a single logical display of 1280 x 2048. It does not provide Presenter 1280 or stereo support. The single framebuffer provides two channels, each of which drives a monitor. The monitors can be placed side-by-side, or one above the other.

Dual Channel Display Package

The dual channel display package includes the following items. If anything is missing, contact your sales representative.

- Dual channel display option board
- Reversible Phillips/flat screwdriver
- Antistatic wrist strap
- *O2 Dual Channel Display Installation Guide* (this manual)
- *O2 Dual Channel Display Software Release Notes*
- Compact disc (CD-ROM)

If you purchased a second monitor in addition to the dual channel display option, you also received:

- A monitor
- Video and power cables for the monitor

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 6.3 for O2 Including R10000" CD.

Locate the online book as follows. From the Toolchest on your desktop, choose Help > Online Books > SGI End User > *O2 Workstation Hardware Reference Guide*.

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 type <http://techpubs.sgi.com/library/>

Installing the Dual Channel Display Option Board

This chapter explains how to install the dual channel display option board. It contains the following topics:

- “Installing the Dual Channel Display Option Board” on page 1
- “Removing the Dual Channel Display Board” on page 26

Installing the Dual Channel Display Option Board

Before installing the board, install the software and software patches as described in the *Dual Channel Display Option Software Release Notes*. Then follow these steps to install the board.

Removing the System Module

Follow these steps to remove the system module:

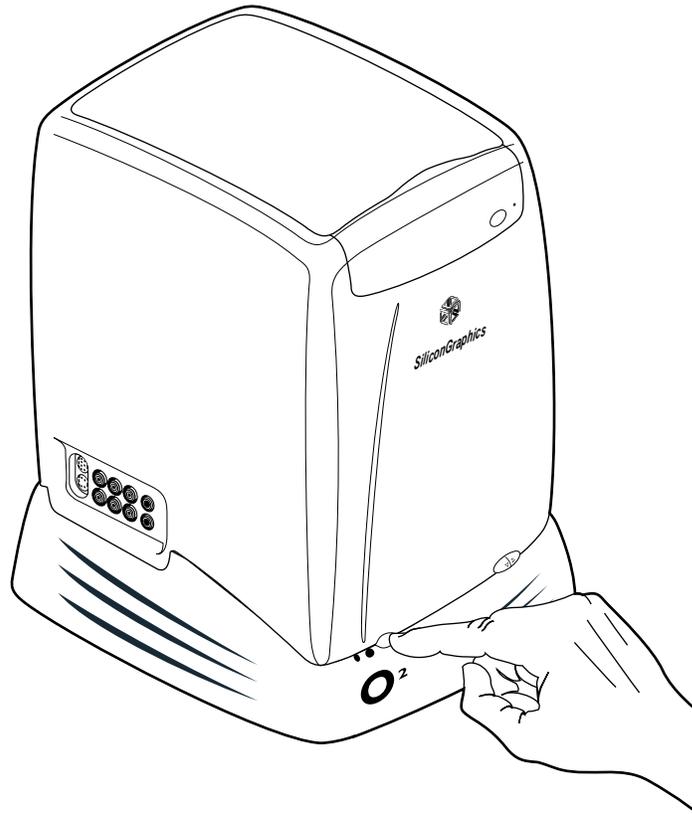


Figure 1-1 Turning Off the Workstation

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

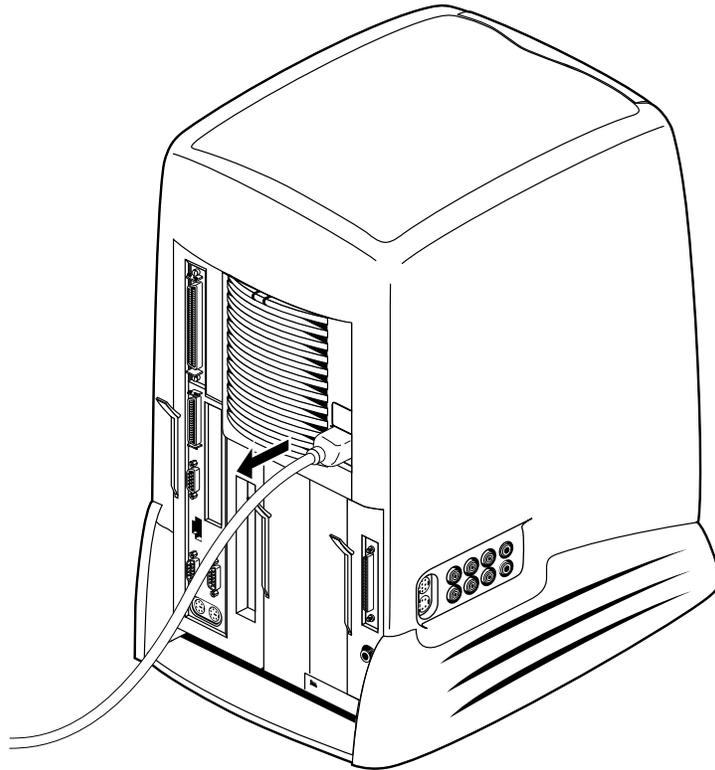


Figure 1-2 Removing the Power Cable

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

2. Remove the cables, including the power cable (Figure 1-2).

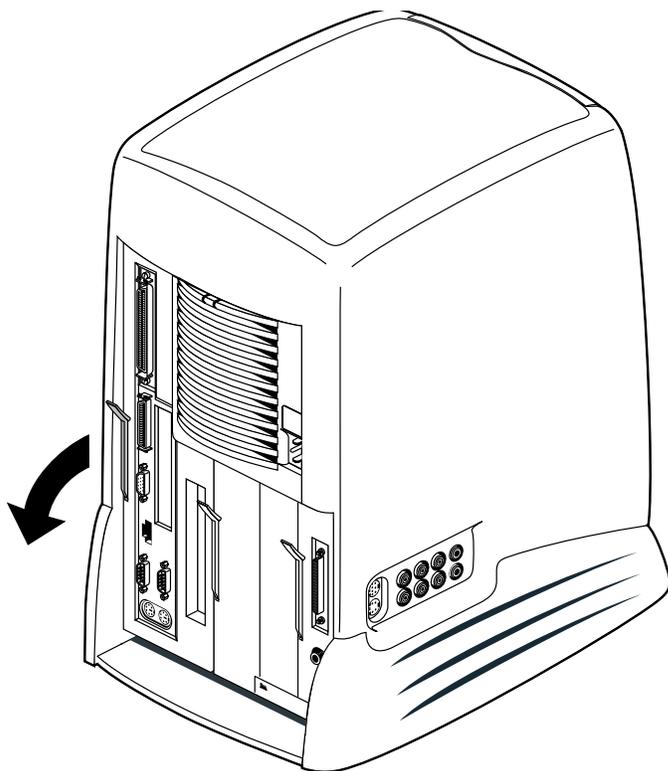


Figure 1-3 Releasing the System Module

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).

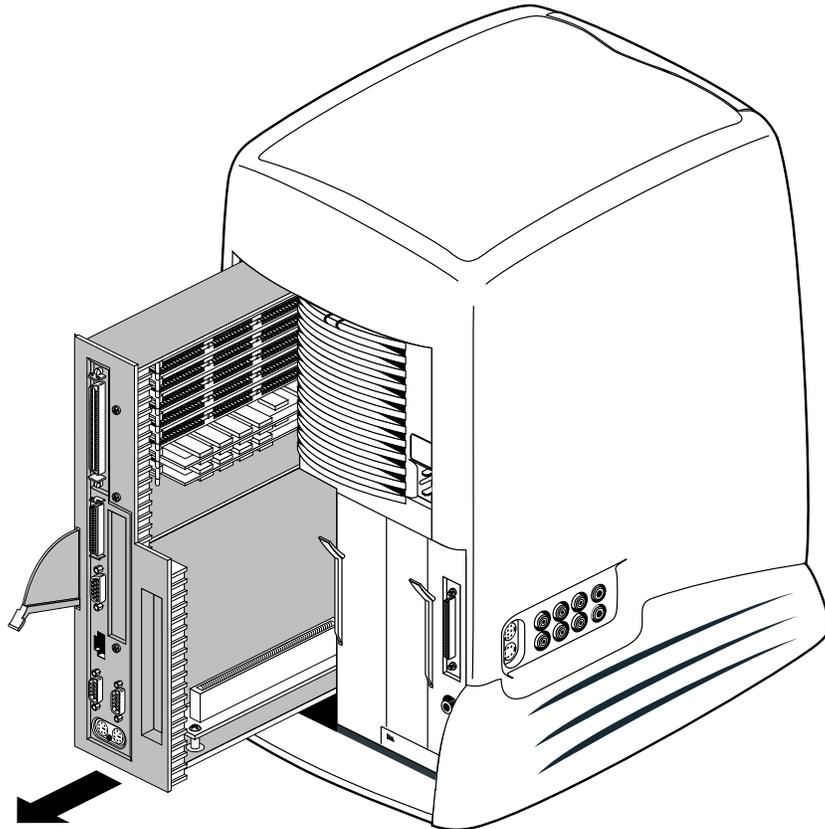


Figure 1-4 Removing the System Module From the Chassis

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 workstation, go to “Removing the PCI Tray: R5000 Workstations” on page 6.
 - If you have an O2 R10000 workstation, go to “Removing the Face Plate and PCI Tray: R10000 Workstations” on page 10.

Removing the PCI Tray: R5000 Workstations

Follow these steps to remove the PCI tray from the system module.

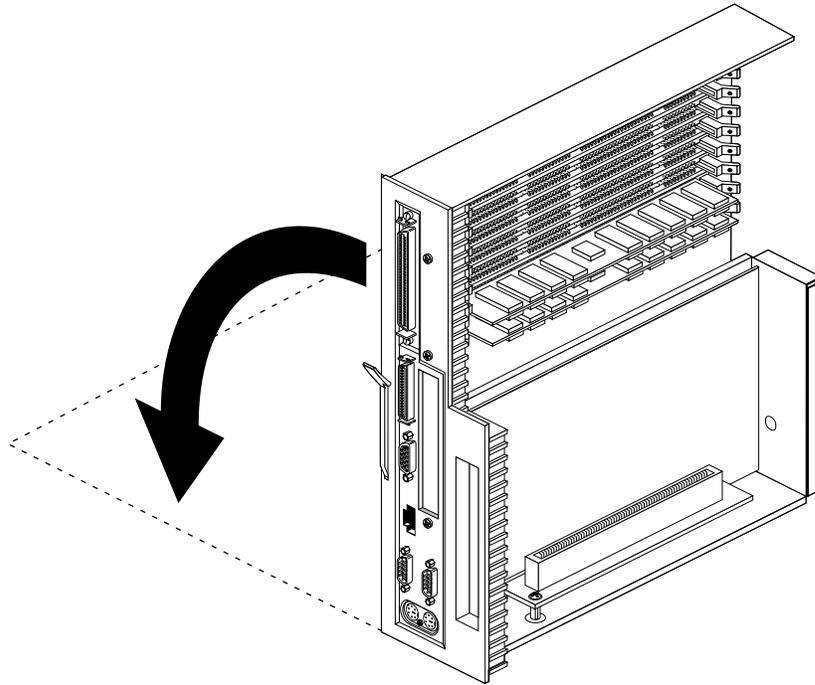


Figure 1-5 Laying the System Module Flat

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

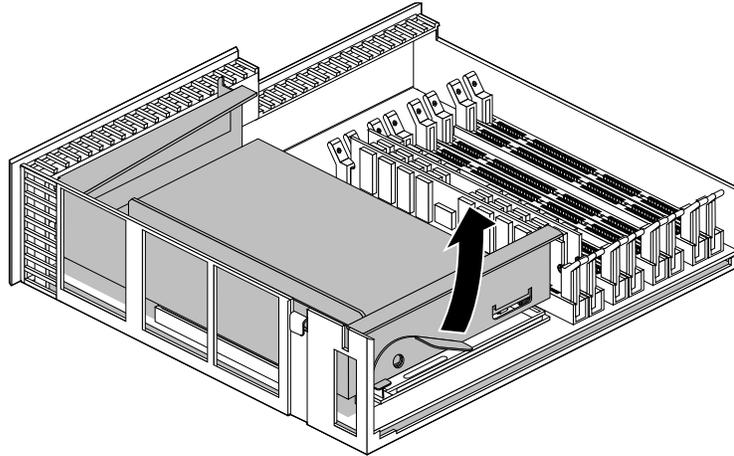


Figure 1-6 Releasing the PCI Tray

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.

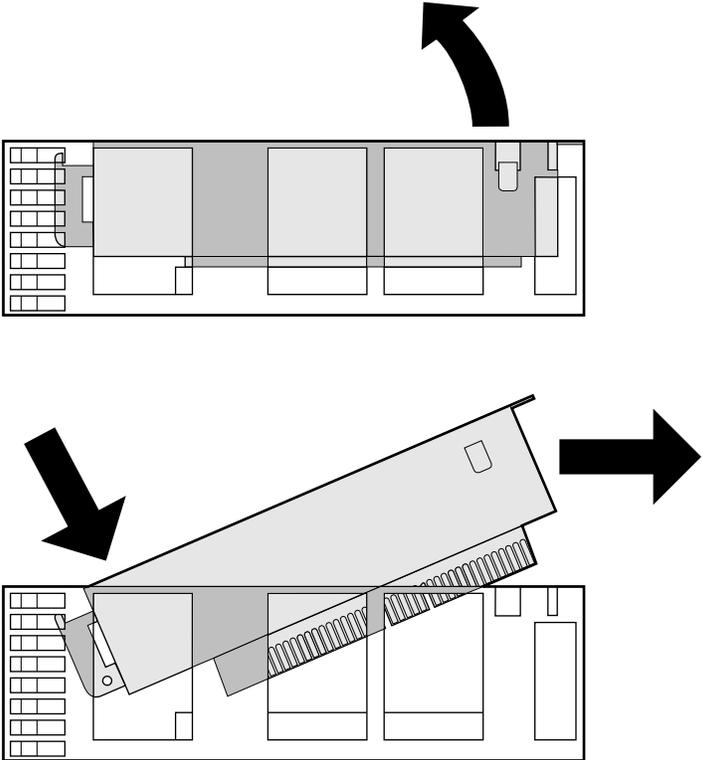


Figure 1-7 Removing the PCI Tray From the System Module Viewed From the Side

- 3. Push down slightly on the rear of the PCI tray to remove it from the system module (Figure 1-7).

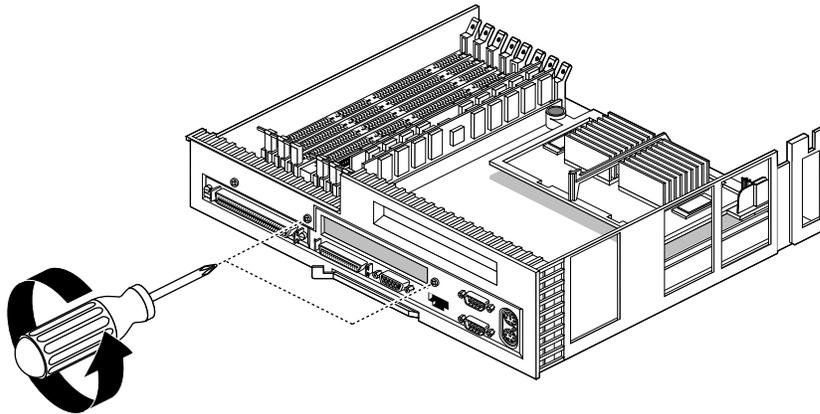


Figure 1-8 Removing the I/O Slot Panel from the R5000

4. If there is a filler panel covering the I/O slot, 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. In the event that you remove the dual channel display board and do not replace it, you must reinstall the panel.
5. Go to “Installing the Board: R5000 and R10000 Workstations” on page 13.

Removing the Face Plate and PCI Tray: R10000 Workstations

Follow this procedure to remove the PCI tray from an R10000 O2 workstation.

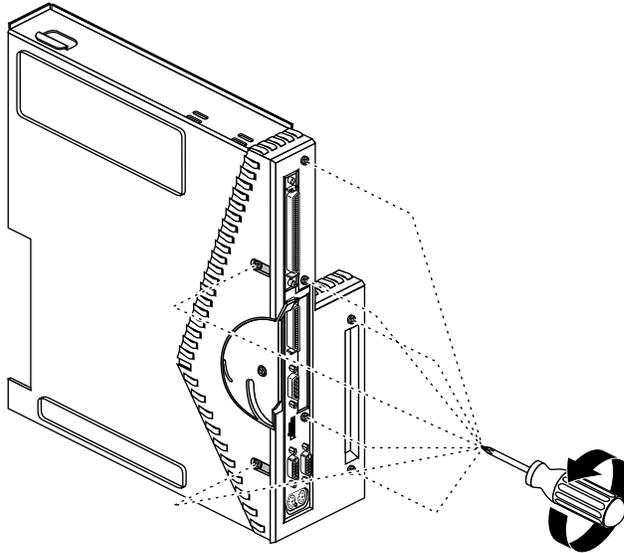


Figure 1-9 Removing the Screws From the Face Plate

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.

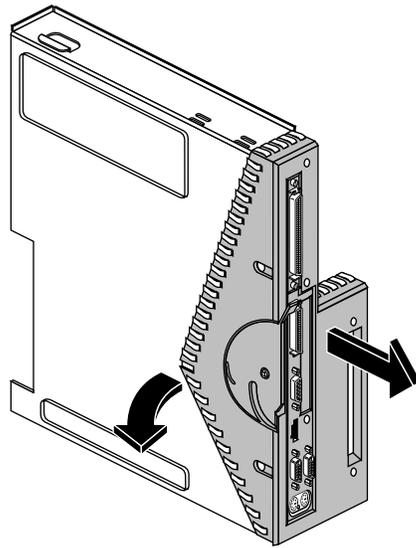


Figure 1-10 Removing the Face Plate from the R10000

- Remove the plastic and metal face plate by grasping it where the plastic comes to a “V” and pulling it outward (Figure 1-10).

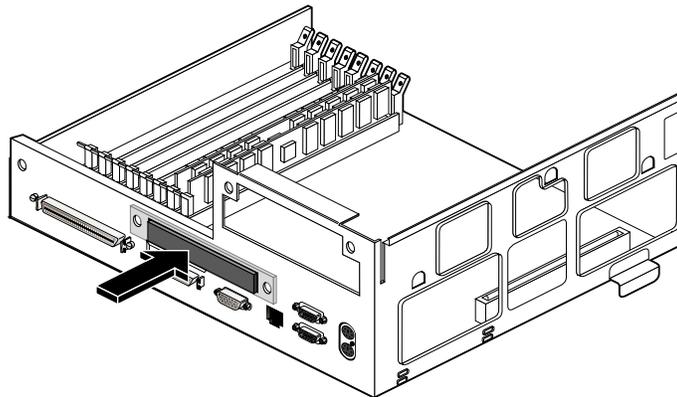


Figure 1-11 Removing the I/O Slot Panel from the R10000

2. Remove the filler panel covering the I/O slot. It should pop out when you push on it (Figure 1-11).

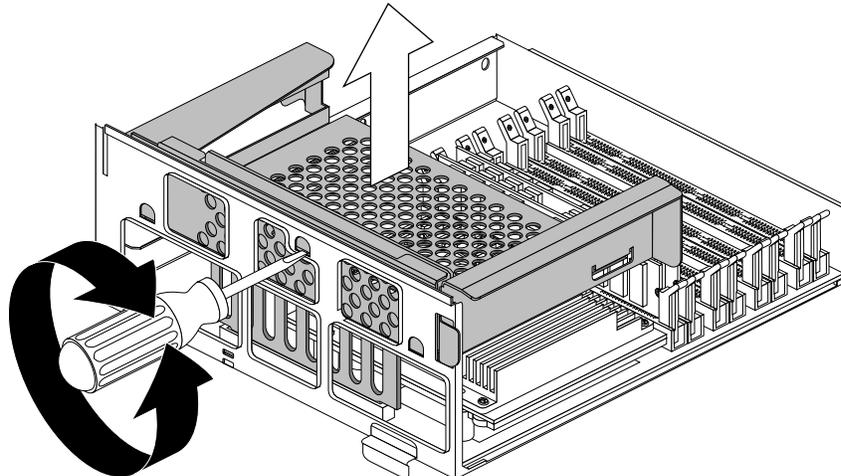


Figure 1-12 Removing the PCI Tray

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: R5000 and R10000 Workstations” on page 13.

Installing the Board: R5000 and R10000 Workstations

Follow these instructions to install the board. The illustrations in this section show an R10000 workstation. The procedure is the same for an R5000 workstation.

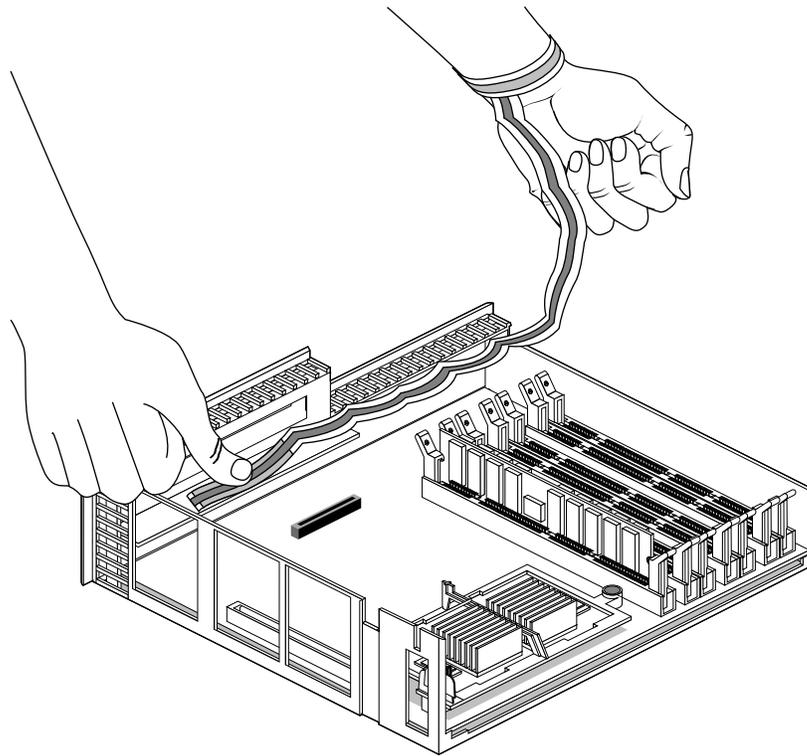


Figure 1-13 Attaching the Wrist Strap

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.

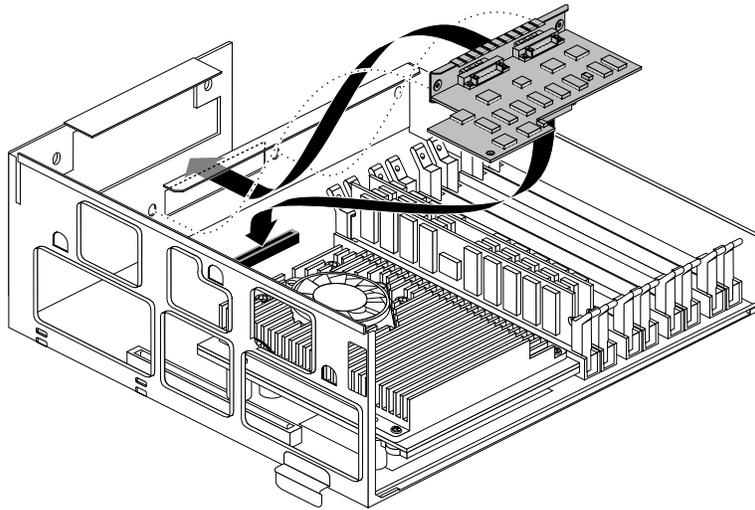


Figure 1-14 Positioning the Option Board

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 I/O opening.
 - Rotate the board downward until it is as flat as possible while pushing toward the I/O opening to align the connectors in the opening.

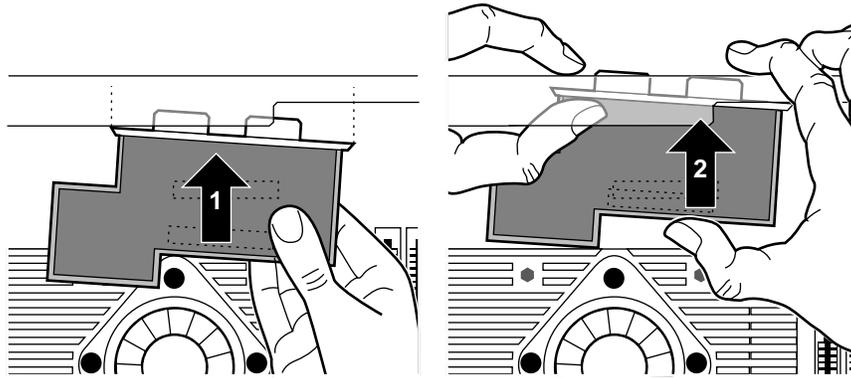


Figure 1-15 Aligning the Option Board

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.

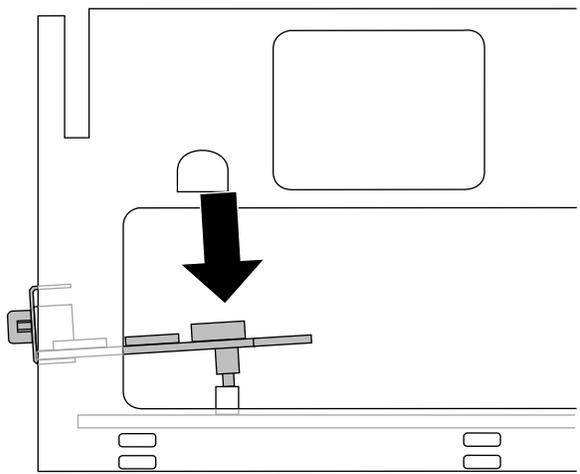


Figure 1-16 Seating the Option Board Viewed From the Side

5. Once the connectors are 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 click as it seats. Look from the side to make sure it's seated all the way.
7. Remove the wrist strap.
8. Reinstall the PCI tray.
 - For R5000 workstations, go to "Reinstalling the PCI Tray: R5000 Workstations" on page 17.
 - For R10000 workstations, go to "Reinstalling the PCI Tray: R10000 Workstations" on page 20.

Reinstalling the PCI Tray: R5000 Workstations

Follow these steps to reinstall the PCI tray in the R5000.

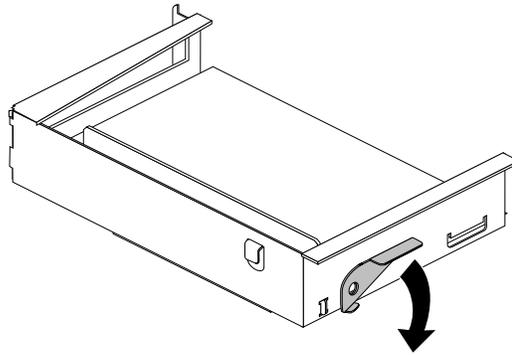


Figure 1-17 Returning the Lever to its Starting Position

1. Push the PCI tray lever to return it to its starting position (Figure 1-17).

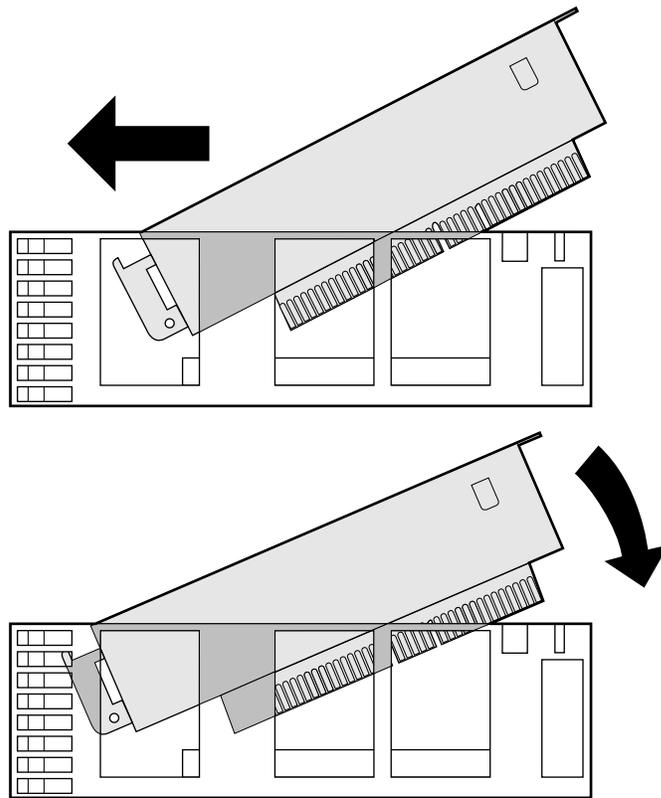


Figure 1-18 Replacing the PCI Tray in the System Module Viewed From the Side

2. Reinstall the PCI tray in the system module (Figure 1-18).
 - 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.

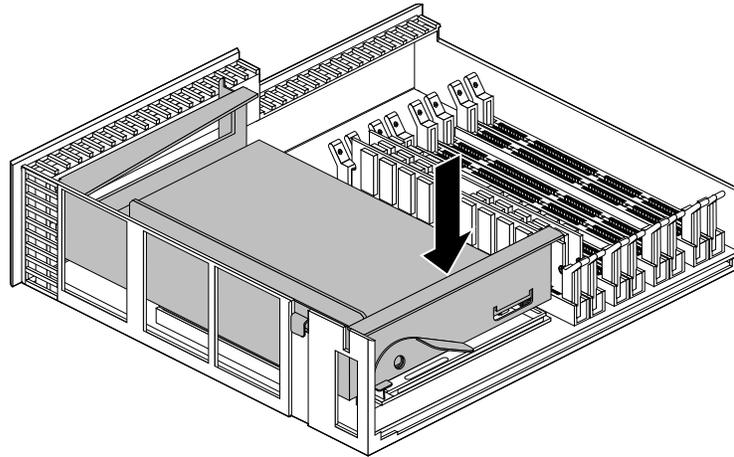


Figure 1-19 PCI Tray Seated Correctly

3. Push the tray down firmly until it is completely seated. You hear a click as it seats (Figure 1-19).

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

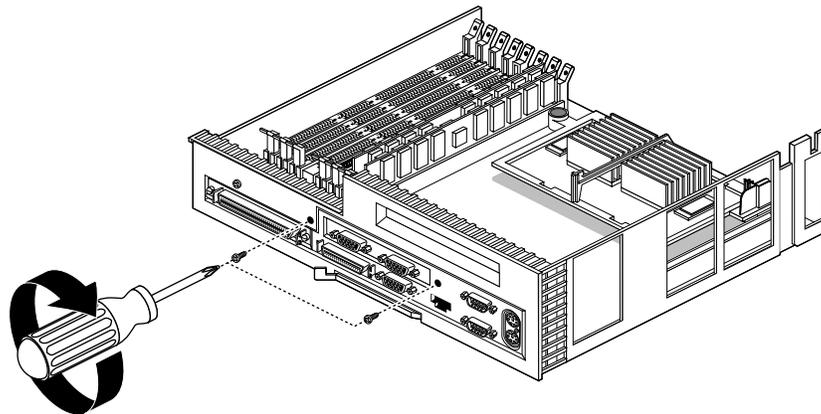


Figure 1-20 Securing the Option Board

4. Secure the option board by replacing the screws as shown in Figure 1-20.
5. Go to “Reinstalling the System Module” on page 23.

Reinstalling the PCI Tray: R10000 Workstations

On an R10000 workstation, follow these steps to replace the PCI tray in the system module.

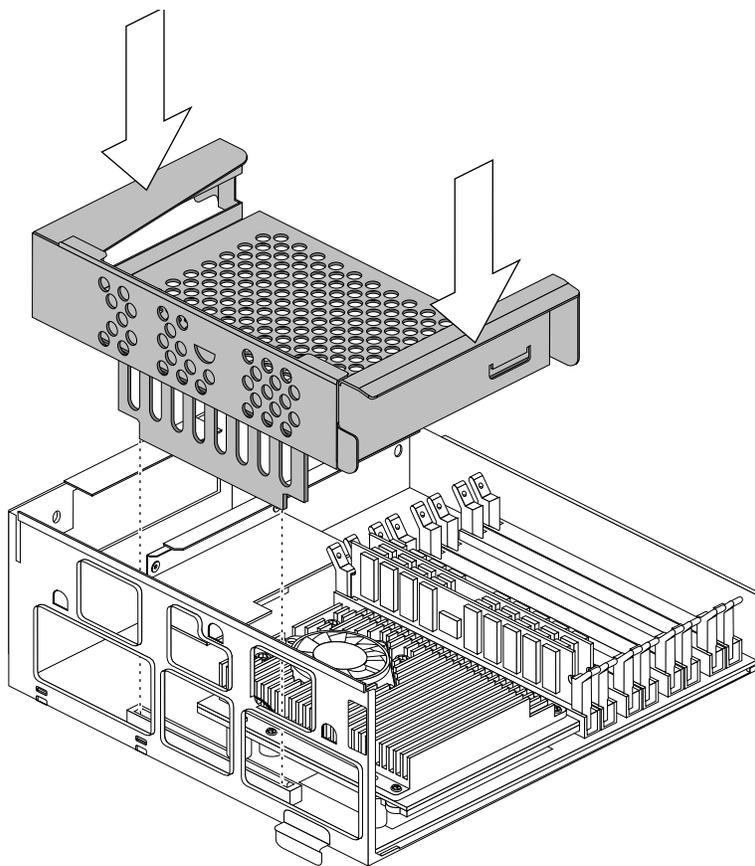


Figure 1-21 Replacing the R10000 PCI Tray in the System Module

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.

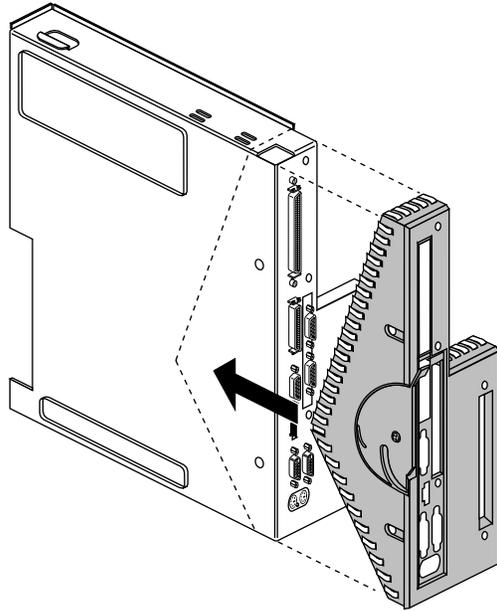


Figure 1-22 Replacing the Face Plate

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).

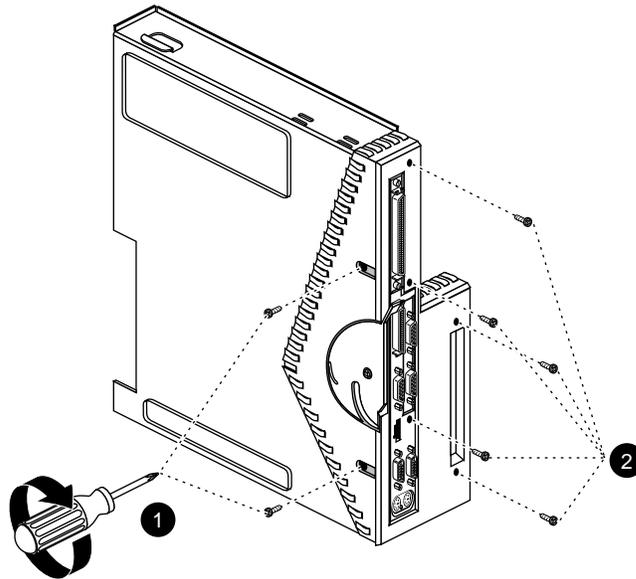


Figure 1-23 Replacing Screws on the Face Plate

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 23.

Reinstalling the System Module

Note: The illustrations in this section show an R5000 workstation. Installing the system module is the same for an R10000 workstation.

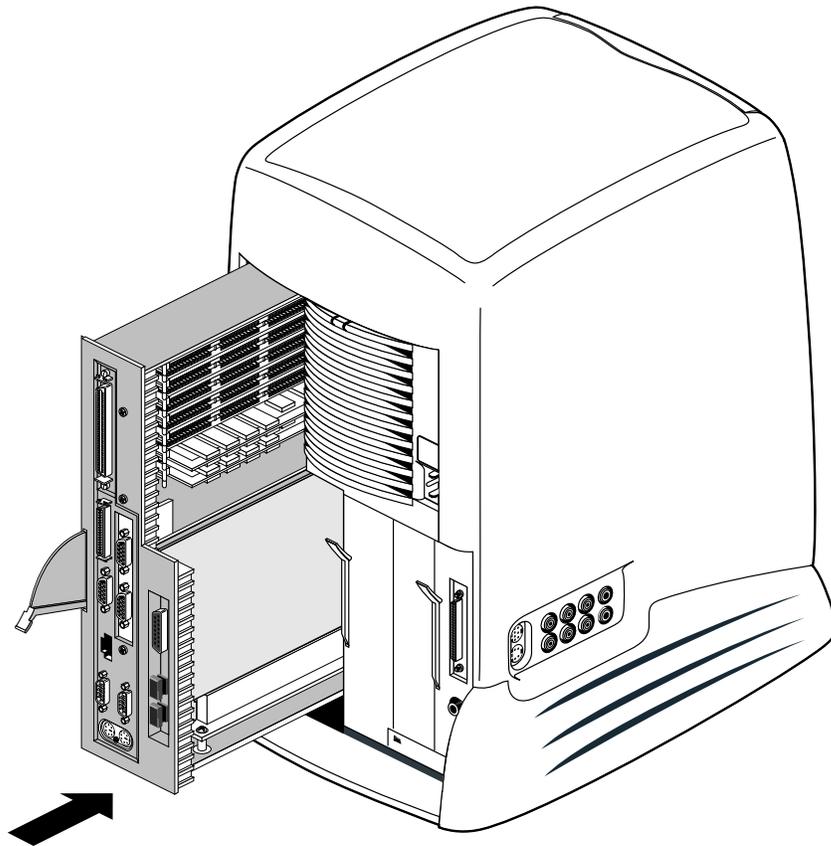


Figure 1-24 Reinstalling the System Module in the Chassis

1. Slide the system module into the chassis until the lever engages (Figure 1-24).

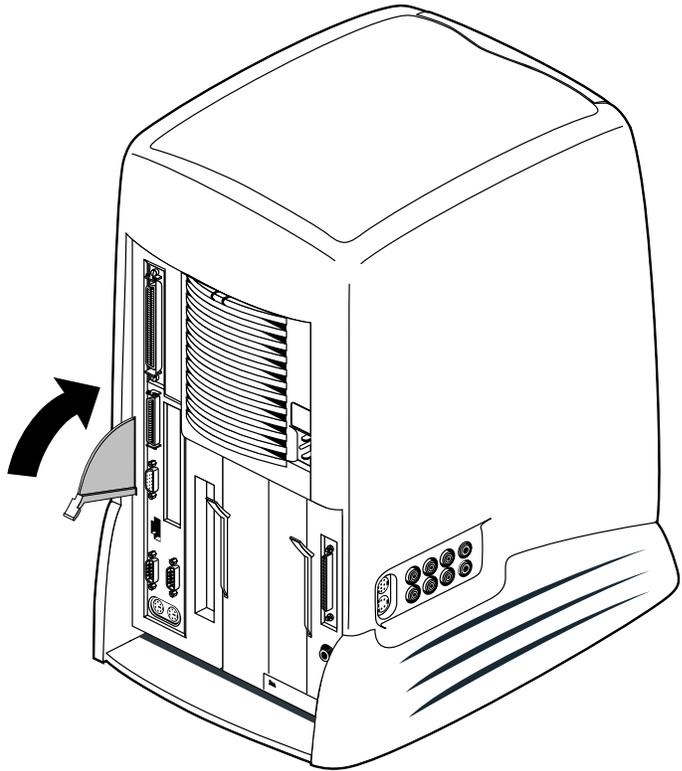


Figure 1-25 Securing the System Module in Place

- 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.

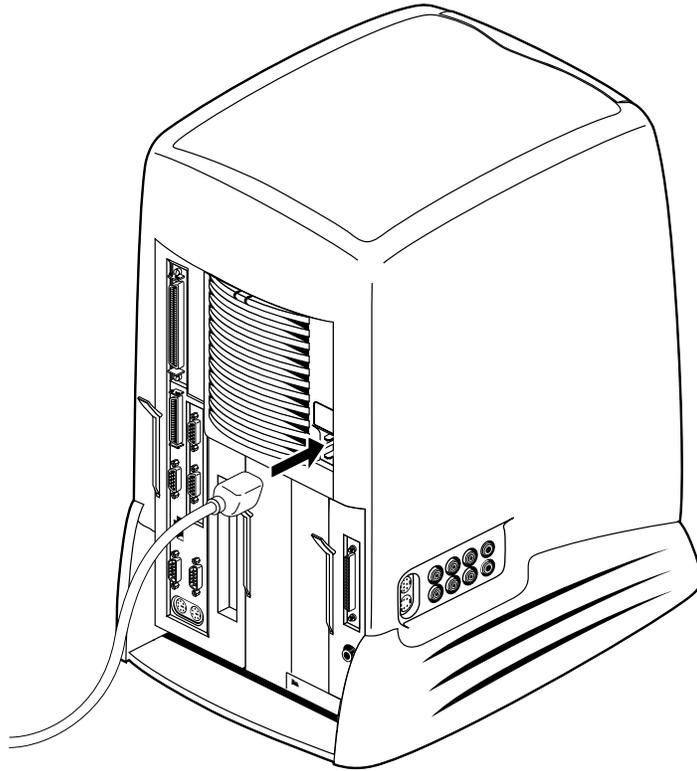


Figure 1-26 Connecting the Power Cable

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 monitors. Go to Chapter 2, "Connecting the Monitors."

Removing the Dual Channel Display Board

Follow these instructions to remove the dual channel display option board:

1. Turn off the workstation and remove the cables, including the power cable. For an illustration, see “Installing the Dual Channel Display Option Board” on page 1.
2. Remove the system module and place it on a clean, flat surface. For instructions and illustrations, see “Removing the System Module” on page 1.
3. Remove the PCI tray. Then return to this page.
 - R5000 workstations, see “Removing the PCI Tray: R5000 Workstations” on page 6.
 - R10000 workstations, see “Removing the Face Plate and PCI Tray: R10000 Workstations” on page 10.
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.

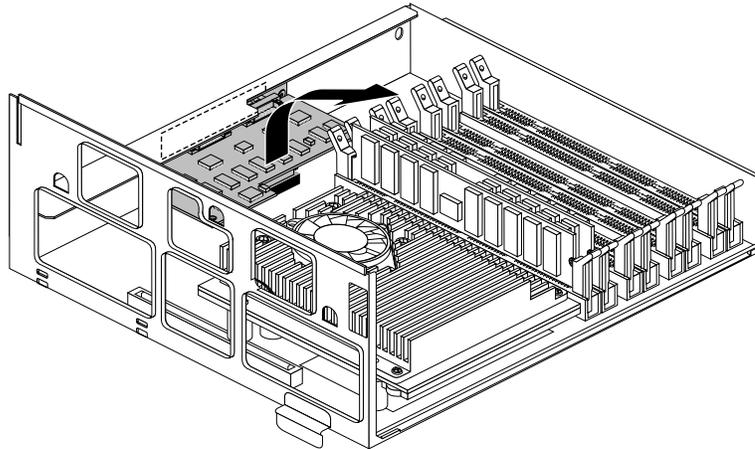


Figure 1-27 Removing the Dual Channel Display Board

5. Grasp the board on either side and gently rock it out (Figure 1-27). Do not exaggerate the rocking motion, or you might bend the pins.

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

6. If you are installing another display option board, follow the installation instructions that came with it. Otherwise, replace the filler panel that you removed when you first installed the display option board.
7. Remove the wrist strap.
8. Replace the PCI tray.
 - R5000 workstations, see “Reinstalling the PCI Tray: R5000 Workstations” on page 17.
 - R10000 workstations, see “Reinstalling the PCI Tray: R10000 Workstations” on page 20.
9. Reinstall the system module, reconnect the power cable, and turn on the workstation. See “Reinstalling the System Module” on page 23.

Connecting the Monitors

You can place your monitors side by side, or you can set them up in a stacked configuration. Follow the appropriate instructions for your configuration.

Note: If you have not already done so, go to Chapter 1, and follow the instructions for installing the dual channel display option board before you begin setting up the monitors.

Unpacking the Secondary Monitor

Unpack the secondary monitor from its box.

Caution: The monitor is very heavy. Have someone help you lift it out of the box.

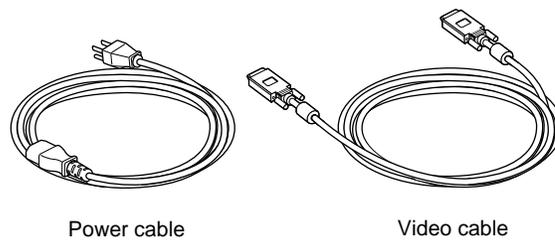


Figure 2-1 Identifying the Cables

The monitor ships with two cables: a power cable and a video cable (Figure 2-1).

Connecting Cables to the Monitors in a Side-by-Side Configuration

Note: To reconfigure cursor movement between monitors from vertical to horizontal, see “Configuring the Mouse for Horizontal Cursor Movement” on page 35.

Connect the video cables to the monitors as follows:

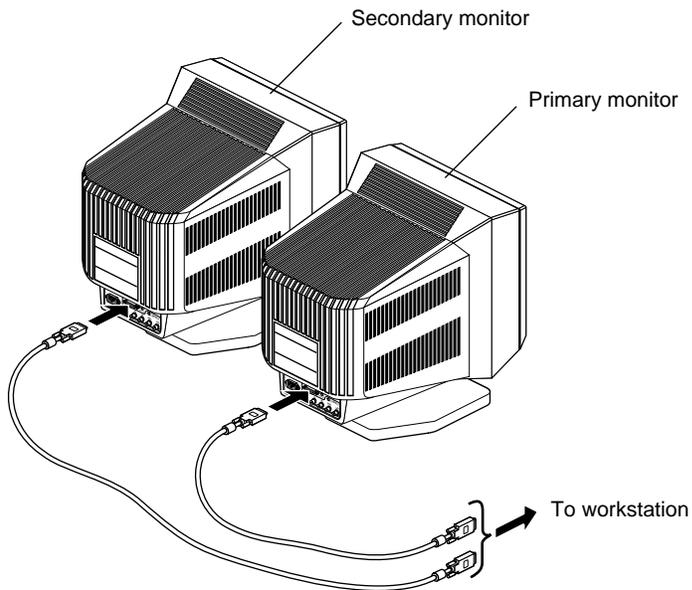


Figure 2-2 Placing the Monitors Side by Side

1. Facing the front of the monitors, place the primary monitor on the left and the second monitor on the right.
2. Connect one end of each video cable to the connector on the back of each monitor. Connect and tighten the thumbscrews on both sides of the connectors (Figure 2-2).

Connecting Cables to the Monitors in a Stacked Configuration

Connect the video cables to the monitors as follows:

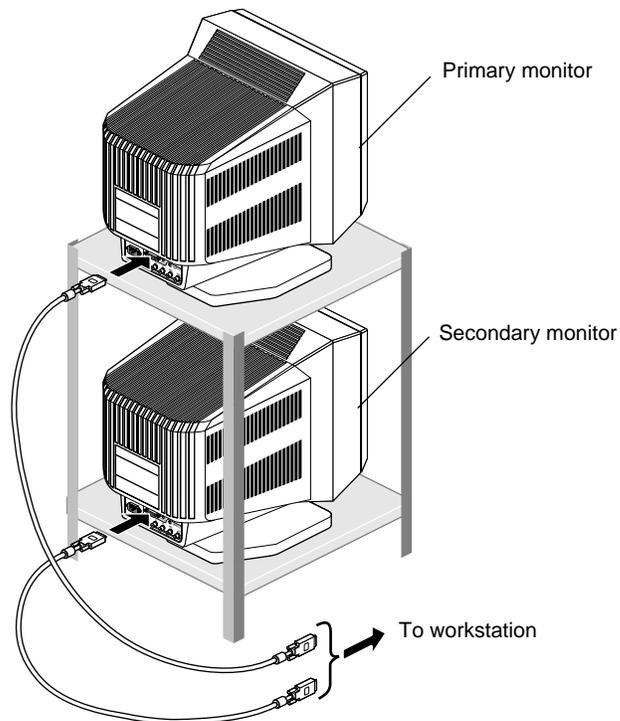


Figure 2-3 Placing the Primary Monitor Above the Secondary Monitor

1. Facing the front of the monitors, place the primary monitor on a surface above the secondary monitor.

Caution: Do not rest the primary monitor on the second monitor. Place it instead on a bookshelf or similar type structure as shown in Figure 2-3.

2. Connect one end of each video cable to the connector on the back of each monitor. Connect and tighten the thumbscrews on both sides of the connectors.

Connecting the Monitor Cables to the O2 Workstation

Note: The illustration shows an O2 R5000 workstation. Connecting the monitor cables is the same for an O2 R10000 workstation.

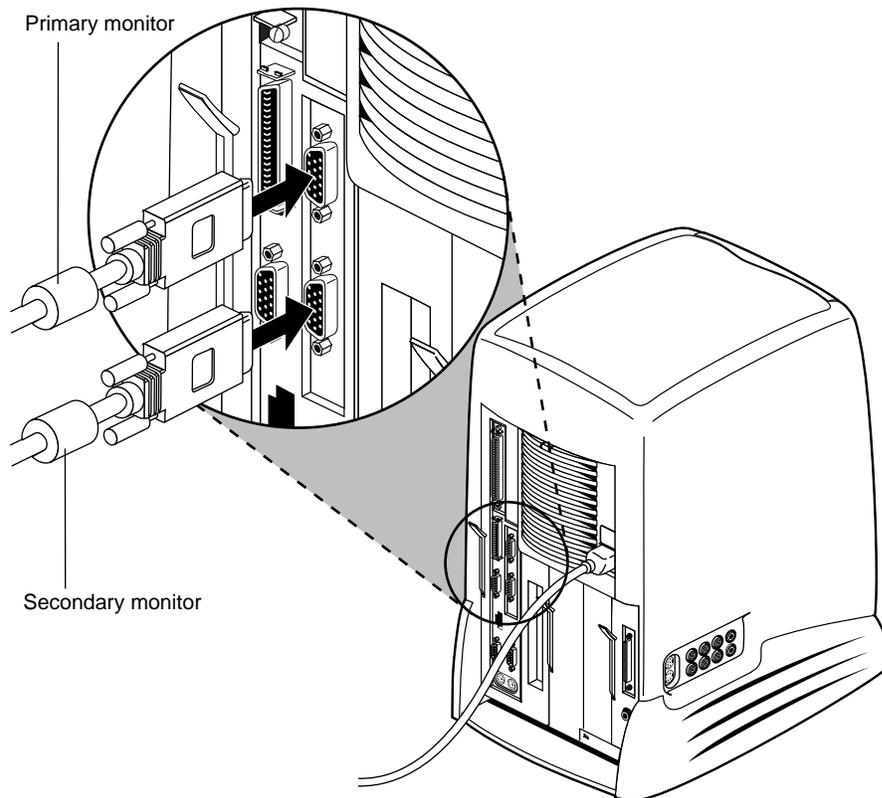


Figure 2-4 Connecting the Monitor Cables to the Workstation

Caution: It's important that you connect the monitor cables to the correct connectors on the rear of the O2 workstation to ensure proper cursor movement.

1. Connect the video cable from the primary monitor to the top connector (channel 0) on the dual channel display board (Figure 2-4). Channel 0 drives the left monitor with the image from the top of the frame buffer.
2. Connect the video cable from the secondary monitor to the bottom connector (channel 1) on the dual channel display board (Figure 2-4). Channel 1 drives the right monitor with the image from the bottom of the framebuffer.
3. Tighten the thumbscrews on both sides of the connectors.

Connecting the Power Cables

Connect the power cable for each monitor as follows:

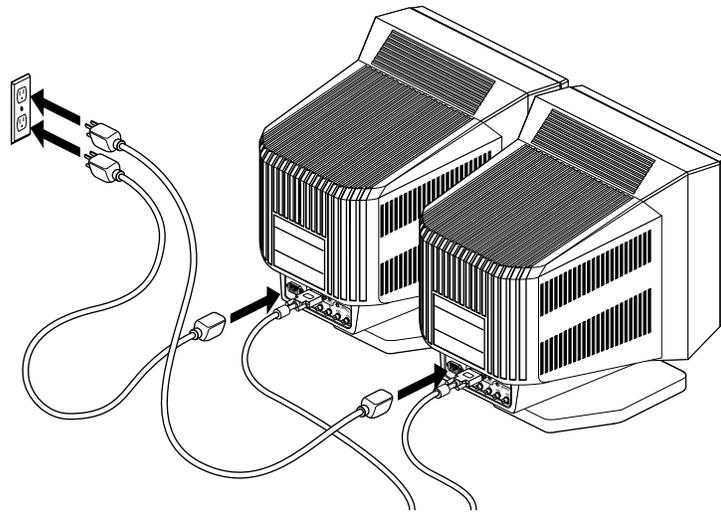


Figure 2-5 Connecting the Monitors' Power Cables

1. Connect the female end of the power cable to the power connector on the back of the monitor (Figure 2-5).
2. Plug the male end into a three-prong grounded electrical outlet.
3. Turn on the primary monitor and then the secondary monitor. The power switch is on the front of the monitor in the lower right corner. The LED near the switch lights up when the monitor is powered on.

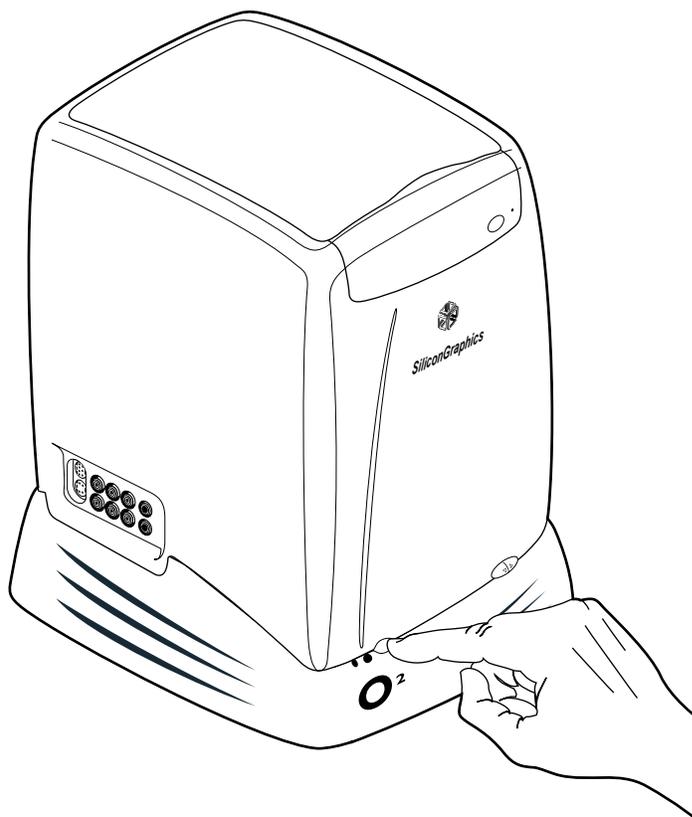


Figure 2-6 Turning On the O2 Workstation

Note: Be sure to turn both monitors on *before* turning on the O2 workstation.

4. Turn on the workstation by pushing the power button on the front (Figure 2-6).

When you first log in after installing the dual channel software and hardware, dual channel mode is not enabled. Go to Chapter 3, “Configuring the Dual Channel Display” for information on configuring and enabling the display.

Configuring the Dual Channel Display

This chapter explains how to enable the dual channel software and how to configure the monitors. It contains the following topics:

- “Before Enabling Dual Channel Mode”
- “Enabling and Disabling Dual Channel Mode” on page 37
- “Resetting Window Positions” on page 39
- “Moving Windows Between Monitors” on page 42
- “Using a Tablet” on page 43

Before Enabling Dual Channel Mode

When you first log in after installing the dual channel software and hardware, dual channel mode is not enabled. Before enabling it, you may want to configure the cursor movement and the window manager maximize behavior.

Configuring the Mouse for Horizontal Cursor Movement

The default cursor movement is vertical from top to bottom and vice versa. If you prefer a horizontal, left to right and right to left cursor movement, shown in Figure 3-1, you can reconfigure the cursor. To do this:

1. Choose Desktop > Open Unix Shell from the Toolchest to open a shell window.
2. Type `su` to log in as root. Type in the root password if necessary.

3. Type at the prompt:

```
cd /usr/lib/X11/input/config  
cp mouse.ptrmap mouse
```

4. Log out and log back in to reset the X server and make this change effective.

To return to vertical cursor movement, remove the `/usr/lib/X11/input/config/mouse` file, log out, then log back in.

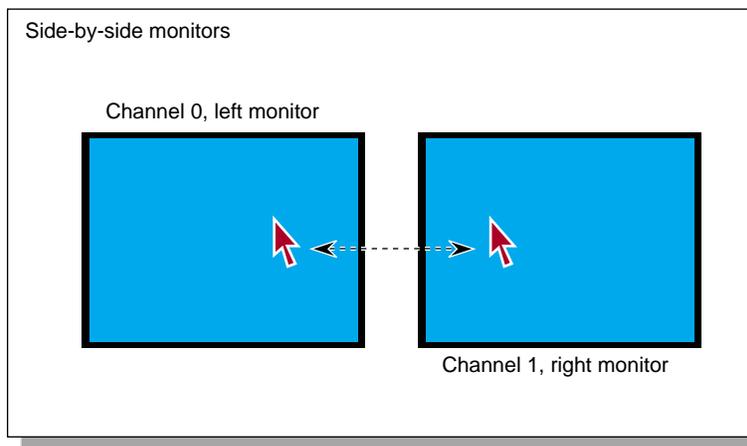


Figure 3-1 Horizontal Cursor Movements

Controlling Window Manager Maximize Behavior

Because of the large logical display (1280 x 2048) of the dual channel option, some applications may use all of the available space and display a single window across both monitors. To get around this, you can control the maximum size of a window by modifying the window manager's default resource file as follows:

1. As root, use an editor such as NEdit to open the file `/usr/lib/X11/app-defaults/4DWM`.

2. Enter the following under `4Dwm Specific Appearance and Behavior Resources`:

```
*maximumMaximumSize: 1280x984
```

This constrains the maximum window size to 1280 x 1024. The 40-pixel difference is for the title bar and the top and bottom window borders.

3. Save the file and exit the editor.
4. Restart the Window Manager. To do this, you can either log out and log back in, or choose `System > Utilities > Restart Window Manager` from the Toolchest, and click `OK`.

Note: The method described here limits a maximized window's size, but does not necessarily position the window fully on one monitor or the other. After clicking the `Maximize` button, you can reposition the window to either monitor.

Enabling and Disabling Dual Channel Mode

Follow these instructions to select a display setting and enable dual channel mode.

Note: These instructions are for IRIX 6.3. In later IRIX versions, `Xscreen` is replaced by `Xsetmon`. In `Xsetmon`, the next time you log out after changing the timing table or framebuffer depth, the existing X server resets itself and loads the new timing table and framebuffer depth before presenting the login screen.

Note: Resolutions with a pixel clock below 50 MHz (for example `VGA`) are not supported in dual channel mode.

1. Type `xscreen` in a shell window to start the application. If you're not logged in as root and the system has a root password, it will prompt you for it.

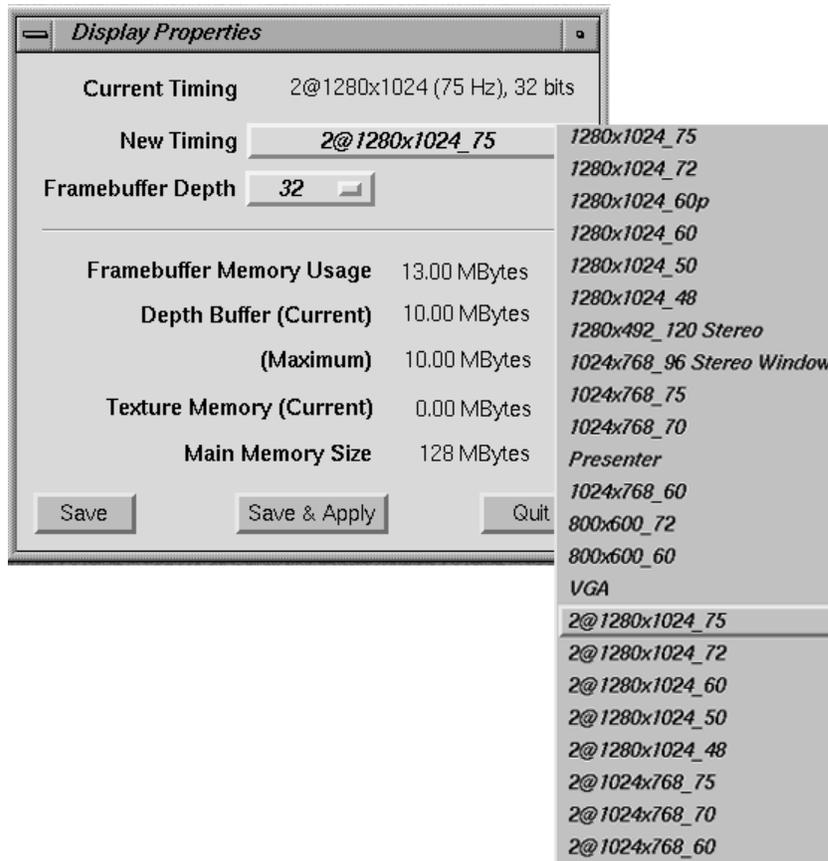


Figure 3-2 The Xscreen Window

2. When the window shown in Figure 3-2 appears, click *New Timing* to see a list of available display settings. The dual channel mode display settings have the prefix "2@."

Choosing a display setting with the prefix "2@" causes the system to switch into dual channel mode the next time the X server is started.

Caution: When you switch in and out of dual channel mode, the X server restarts, closing all currently open windows. The Xserver also restarts when you switch between 1280x1024 and 1024x768 formats in dual channel mode.

3. To enable dual channel mode, select a setting with the prefix "2@" and click *Save & Apply*.
4. Click *OK* in the dialog box to kill the X server. Note that any windows you had open are lost. A new X server session is started and the display setting you chose is active. The login screen appears.

To disable dual channel mode, select a setting that does not have a "2@" prefix and click *Save & Apply*. Click *OK* in the dialog box to kill the X server. Note that any windows you had open are lost. A new X server session is started and the display setting you chose is active. The login screen appears.

If you disable the dual channel display and both monitors are still connected, the same image is displayed on both monitors.

Resetting Window Positions

The dual channel display provides a single logical screen displayed vertically over two monitors. Most applications position their popup windows near their main window, or near the cursor.

However some applications center their popup windows. The dual channel display works as if the two monitors were a single logical display. If you're using an application that centers its popup window, in dual channel mode the window will overlap both displays vertically. The upper half of the window will be at the bottom of the left monitor, and the lower half at the top of the right monitor. See Figure 3-3.

To get around this, you need to modify the application's resources. See the instructions following the next figure.

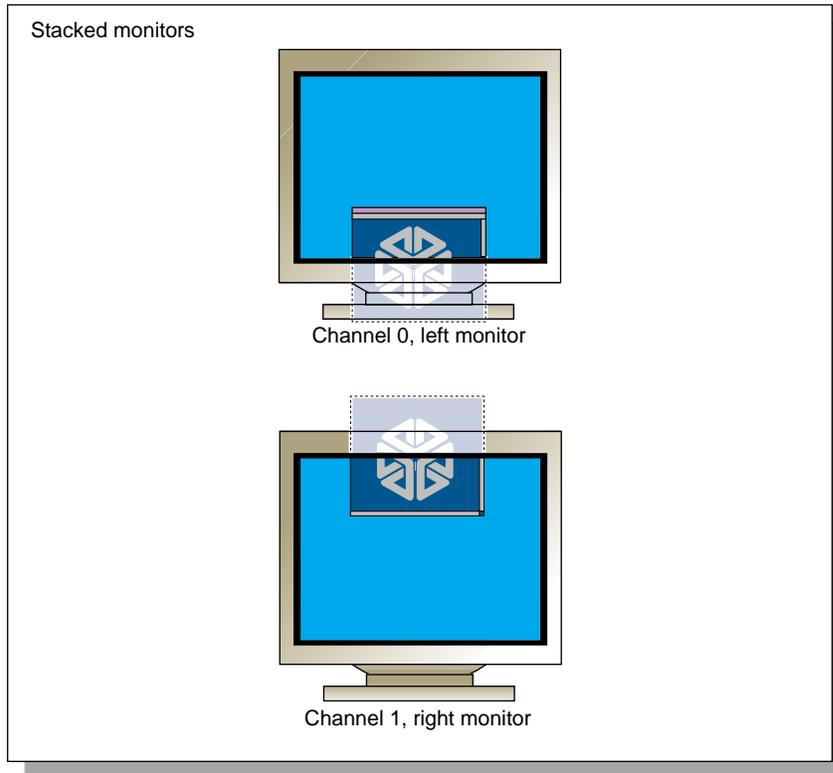


Figure 3-3 Overlapping Windows

To launch an application in a specific location, add the “-geometry” option to the command line. For example, the following command opens a window with the upper left hand corner of the window 30 pixels from the left of the screen and 200 pixels from the top of the screen.

```
xterm -geometry +30+200
```

To place a window on the second display, add 1024 to the second number. For example:

```
xterm -geometry +30+1224
```

You can also set this X resource in *\$HOME/.Xdefaults*. For example, the following command forces all xwsh windows to open with the upper left hand corner of the window 30 pixels from the left of the screen and 200 pixels from the top of the screen.

```
XWsh*geometry: +30+200
```

XWsh is the application's Classname.

Also, you can use the Window Setting Control Panel to set window locations explicitly or to their last (continuous) positions before logout. To do this, from the Toolchest choose Desktop > Customize > Windows.

Moving Windows Between Monitors

When the mouse or tablet is configured for horizontal cursor movement between monitors, and you move a window from the left monitor to the right one, the window follows the cursor as it jumps between screens. However, as it moves across, the right edge of the window is clipped to the right edge of the left monitor, and the left edge is clipped to the left edge of the right monitor. Therefore the window doesn't move smoothly across, but appears to jump across when the cursor moves between monitors. See Figure 3-4.

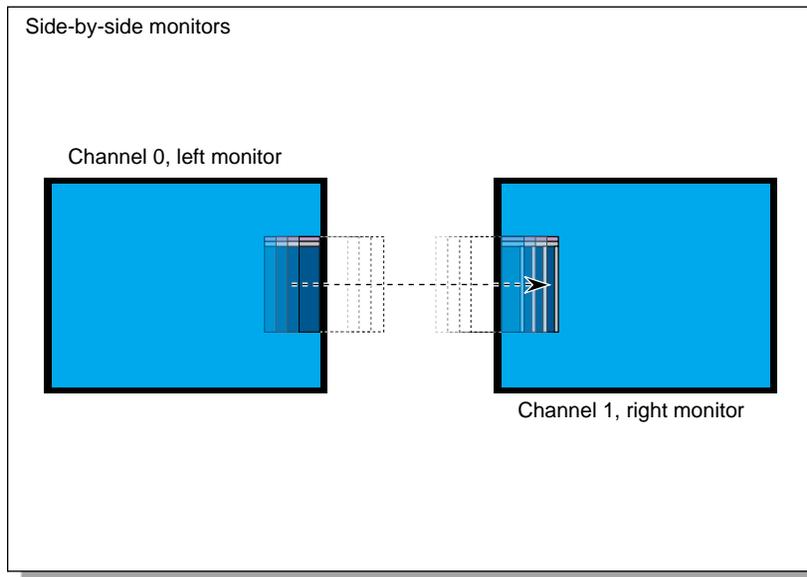


Figure 3-4 Moving Windows Horizontally Between Monitors

Resizing Windows

When the mouse or tablet is configured for horizontal cursor movement between monitors, it's important to keep the cursor on the same monitor as the window that is being resized. If you attempt to stretch a window to span both monitors the window will be oddly shaped. You can see the size and shape of the window that will be produced by looking at the red and white highlighted window borders as you stretch the window.

Using a Tablet

Tablet devices are often configured to move the cursor in addition to the mouse. By default, the logical display area (1280x2048, vertical) is mapped to some part of the active area of the tablet. If you configured your mouse for horizontal cursor movement, you may wish to map the virtual display area (2560x1024, horizontal) to the tablet. To do this, you need to create a configuration file for the tablet with the following contents:

```
device_init {
    module    "ptrmap"
}
```

Create the file in the directory */usr/lib/X11/input/config*. The filename must correspond to the module name for your tablet device as shown in the *input(7)* man page. For instance, for a Calcomp tablet, this file would be */usr/lib/X11/input/config/calcomp*. You need root access to create files in this directory.

For tablet devices, pointer events are usually either scaled so that screen positions map to fit the full active area of the tablet, or to fit as close as possible while maintaining a 1:1 aspect ratio for X and Y values. The *x_init* control "scale" (which determines the appropriate scaling automatically) does not work as expected when the "ptrmap" module is associated with the device. Instead, set the "scalex" and "scaley" *x_init* controls to set the scale explicitly.

x_init controls are placed in a file in the directory */usr/lib/X11/input/config* which is named according to the X name of the tablet device. For instance, for a Calcomp tablet, this file would be */usr/lib/X11/input/config/tablet*.

If the horizontal resolution of a tablet is 9000 (perhaps a 9 inch wide tablet with 1000 line per inch resolution) and the virtual screen resolution is 2560x1024, the following configuration file contents enable the tablet as a pointer device and scale pointer events to use the whole width of the tablet:

```
x_init {
    pushpointer    "on"
    autostart      "on"
    scalewhich     "none"
    scalex         "2560/9000"
    scaley         "2560/9000"
}
```

Setting the same scaling factor for X and Y maintains a 1:1 aspect ratio. To scale to fit in the Y dimension as well, determine the scaling factor for Y in the same manner as described above for X.

For a Wacom tablet, both the module name and the X name are “wacom,” so a single configuration file named */usr/lib/X11/input/config/wacom* is used for both the `device_init` and `x_init` statements. Also, the Wacom tablet driver automatically scales pointer events to fit the active area of the tablet, so it is not necessary to set the X and Y scaling factors in the configuration file. To configure the driver to maintain a 1:1 aspect ratio when scaling, use the following configuration file contents:

```
device_init {
    module      "ptrmap"
}
x_init {
    pushpointer "on"
    autostart   "on"
    scalewhich  "none"
    rescale     "aspect"
}
```

For more information about input devices, input device configuration files, and device controls, see the `input(7)` man page.

Troubleshooting, Technical Specifications and Regulatory Information

The following topics are covered in this chapter.

- “Troubleshooting” on page 45
- “Product Support” on page 47
- “Returning Parts” on page 47
- “Technical Specifications” on page 48
- “Manufacturer’s Regulatory Declarations” on page 49

Troubleshooting

This section provides some troubleshooting tips.

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

Verifying the Hardware Installation

If you’re encountering problems with the monitors, first check that the board shows up in the hardware inventory. Open a UNIX shell. At the prompt, enter

```
hinv
```

Look for the following line describing the board you installed:

```
Dual Channel Display
```

The suggestions in Table 4-1 may help you isolate the problem.

Table 4-1 Troubleshooting Tips

Symptom	Possible Cause
Dual channel display board does not show up in <i>hinv</i> .	The board is either not installed correctly, or is faulty. Go over the installation steps again, making sure you press the board all the way in. You should hear a click as it is seated. If reseating the board doesn't solve the problem, the board may be faulty. Call your service representative.
Same image appears on both monitors	Dual channel display software patches are not installed or timing mode is set to single channel. See "Installing the Dual Channel Display Option Board" on page 1.
Monitors display a black or very dark image	Monitors do not recognize the video black level because dual channel display software patches are not installed. See "Installing the Dual Channel Display Option Board" on page 1. Or board may be faulty.
Only one monitor is connected to the main video connector on the system board, and no image is displayed.	The dual channel display display settings may be enabled. To disable them, see "Enabling and Disabling Dual Channel Mode" on page 37.
Primary monitor is blank and secondary monitor displays correct image.	The primary monitor may be connected to the main video connector on the system board, instead of to the dual channel display board. Check that both monitors are connected to the dual channel display board. See "Connecting the Monitor Cables to the O2 Workstation" on page 32.
One monitor displays the image correctly, but the other monitor's image is frozen.	The board is probably faulty. Call your service representative.
The images on both monitors alternate between the correct image and noise, a constant color, or a badly flickering image.	The board is probably faulty. Call your service representative.

Table 4-1 (continued) Troubleshooting Tips

Symptom	Possible Cause
Xscreen dual channel display timing tables are not displayed.	The dual channel display software patches are not installed. See "Installing the Dual Channel Display Option Board" on page 1.
Some windows appear to overlap, with part of the window on top of one monitor, and part of the window on the bottom of the other monitor.	You may need to modify your application's resources or manually move the popup window. See "Resetting Window Positions" on page 39.

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

Table 4-2 shows the cable pinout assignments for both DSUB15 connectors on the dual channel display board. The pinouts are the same as the main video connector pinouts on the system board.

Table 4-2 Dual Channel Display Pinout Assignments

Pin	Assignment
1	RED
2	GREEN (with composite sync)
3	BLUE
4	RESERVED
5	GROUND
6	RED RETURN
7	GREEN RETURN
8	BLUE RETURN
9	+5V, limited current
10	GROUND
11	RESERVED
12	DDC DATA
13	HORIZONTAL SYNC (Not Active)
14	VERTICAL SYNC (Not Active)
15	DDC CLOCK

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.

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

The device 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.

Class A

Table 4-3 Class A FCC Declaration of Conformance

Trade Name	Silicon Graphics, Inc.
Product	O2 Dual Channel Display Option
Model Number	CMNB014A
Date of Conformance	April 1998
Responsible Party	Silicon Graphics, Inc.
Address	2011 North Shoreline Boulevard, Mountain View, California 94043-1389
Telephone	(650) 933-1071

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This

equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: The user is cautioned that changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

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 A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Figure 4-1 Japan's VCCI Class A Statement

Radio and Television Interference

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

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

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

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

- Turn the television or radio antenna until the interference stops.
- Move the workstation to one side or the other of the radio or television.
- Move the 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.)
- For additional information, check the FCC web site at <http://www.fcc.gov/Bureaus/Compliance/WWW/tribook.html>

Shielded Cables

The device is FCC-compliant under test conditions that include the use of shielded cables between the workstation and its peripherals. Your 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.

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 workstation 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.

Index

C

- cable pinouts, 48
- cables
 - connecting to monitors side-by-side, 30
 - connecting to monitors stacked, 31
 - monitors to workstation, 32
 - video and power, 29
- cables,using shielded, 52
- conformance declaration, 49
- connecting
 - monitors to workstation, 32
- customer support, 47

D

- declaration of conformance, 49
- disabling dual channel mode, 39
- displays, connecting, 29
- dual channel display
 - disabling, 39
 - enabling, 37
 - explained, ix
 - installing, 1
 - package contents, x
 - removing, 26
 - troubleshooting, 45

E

- enabling dual channel mode, 37

F

- framebuffer capacity, ix

G

- grounding with wrist strap, 13

H

- help, 45

I

- installation, verifying hardware, 45
- installing
 - dual channel display, 1
 - monitors, 29
 - system module, 1
- interference to radios and televisions, 51

M

manufacturer's regulatory declaration, 49
monitor power cables, connecting, 33
monitors
 connecting, 29

P

parts, returning, 47
PCI tray R10000, removing, 10
PCI tray R5000, removing, 6
pinouts, 48
power cables to monitors, 33
product support, 47

R

radio interference, 51
regulatory
 information, 49
removing the dual channel display, 26
resolutions not supported, 37
returning parts, 47

S

shielded cables, 52
Silicon Graphics support, 47
specifications, 48
support, Silicon Graphics, 47

T

technical specifications, 48
television interference, 51
troubleshooting, 45

V

VGA resolution, not supported, 37

W

windows
 overlapping, 39
 resetting, 39
window sizes
 resetting, 36
workstations
 radio and television interference caused by, 51
wrist strap, attaching, 13

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